Bloodstream Infection Event (Central Line-Associated Bloodstream Infection and Non-central line-associated Bloodstream Infection)

Introduction: An estimated 30,100 central line-associated bloodstream infections (CLABSI) occur in intensive care units and wards of U.S. acute care facilities each year.[1] These infections are usually serious infections typically causing a prolongation of hospital stay and increased cost and risk of mortality.

CLABSI can be prevented through proper insertion techniques and management of the central line. These techniques are addressed in the CDC's Healthcare Infection Control Practices Advisory Committee (CDC/HIPAC) *Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011*.[2]

Settings: Surveillance may occur in any inpatient location where denominator data can be collected, which can include critical/intensive care units (ICU), specialty care areas (SCA), neonatal units including neonatal intensive care units (NICUs), step down units, wards, and long term care units. A complete listing of inpatient locations and instructions for mapping can be found in the CDC Locations and Descriptions chapter.

Note: Surveillance for CLABSIs after the patient is discharged from the facility is not required. However, if discovered, any CLABSIs with a date of event on the day of discharge or the next day should be reported to NHSN (see Transfer Rule). No additional central line days are reported.

Definitions:

Present on Admission (POA): Infections that are POA, as defined in Chapter 2, are not considered HAIs and therefore are never reported to NHSN.

Healthcare-associated infections (HAI): All NHSN site specific infections must first meet the HAI definition as defined in Chapter 2 before a site specific infection (e.g., CLABSI) can be reported to NHSN.

Primary bloodstream infections (BSI): Laboratory-confirmed bloodstream infections (LCBI) that are not secondary to an infection at another body site (see Appendix 1. Secondary Bloodstream Infection (BSI) Guide and Surveillance Definitions chapter).

Date of event (DOE): For a BSI the date of event is the date when the FIRST element used to meet the laboratory-confirmed bloodstream infection (LCBI) criterion occurred. Synonym: infection date.

Central line: An intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring. The following are considered great vessels for the purpose of reporting central-line BSI 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
- Common iliac veins
- Femoral veins
- In neonates, the umbilical artery/vein.

Notes:

1. Neither 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 the great vessels or in or near the heart, and be used for one of the purposes outlined above, to qualify as a central line.
2. At times an intravascular line may migrate from its original great vessel location. Subsequent to the original confirmation, NHSN does not require ongoing confirmation that a line resides in a great vessel. Therefore, once a line is identified to be a central line for NHSN purposes, it is considered a central line until discontinuation, regardless of migration.
3. An introducer is considered an intravascular catheter, and depending on the location of its tip and use, may be a central line.
4. Pacemaker wires and other non-lumened devices inserted into central blood vessels or the heart are not considered central lines, because fluids are not infused, pushed, nor withdrawn through such devices.
5. The following devices are not considered central lines:
    - Extracorporeal membrane oxygenation (ECMO)
    - Femoral arterial catheters
    - Intra-aortic balloon pump (IABP) devices.
    - Hemodialysis reliable outflow (HeRO) dialysis catheters

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, IV antimicrobial administration, or blood transfusion or hemodialysis.

Umbilical catheter: A central vascular device inserted through the umbilical artery or vein in a neonate.

Temporary central line: A non-tunneled, non- implanted catheter.
Permanent central line: Includes

- Tunneled catheters, including certain dialysis catheters
- Implanted catheters (including ports)

Central line-associated BSI (CLABSI): A laboratory-confirmed bloodstream infection (LCBI) where central line (CL) or umbilical catheter (UC) was in place for >2 calendar days on the date of event, with day of device placement being Day 1,

AND

a CL or UC was in place on the date of event or the day before. If a CL or UC was in place for >2 calendar days and then removed, the date of event of the LCBI must be the day of discontinuation or the next day. If the patient is admitted or transferred into a facility with an implanted central line (port) in place, and that is the patient's only central line, day of first access in an inpatient location is considered Day1. "Access" is defined as line placement, infusion or withdrawal through the line. Such lines continue to be eligible for CLABSI once they are accessed until they are either discontinued or the day after patient discharged (as per the Transfer Rule). Note that the "de-access" of a port does not result in the patient's removal from CLABSI surveillance.

Examples of Determining a CLABSI verses BSI

- Patient in MICU has central line inserted/accessed on June 1. On June 3, the central line is still in place and the patient has positive blood culture with *S. aureus*. This is a CLABSI because the central line was in place for >2 calendar days (June 1, 2, and 3) on the date of event (June 3).
- Patient has a central line inserted on June 1. On June 3, the central line is removed and on June 4 the patient has a positive blood culture with *S. aureus*. This is a CLABSI because the central line was in place for >2 calendar days (June 1, 2, and 3), and was in place the day before the date of event (June 4).
- A central line is placed in the facility on May 30th. On June 3, the central line is removed and on June 5 patient spikes a fever of 38.3°C. Two blood culture sets collected on June 6 are positive for *S. epidermidis*. This is may be a healthcare-associated bloodstream infection but it is not a CLABSI because the Date of Event (June 5) did not occur on the day the central line was discontinued (June 3) or the next day (June 4).

Notes:

- **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 (NOT to be read as 24 hours), 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. See Figure 1 below.

- Bloodstream infections will not be reported if they occur within the Repeat Infection Timeframe of a previously identified BSI. See Repeat Infection Timeframe guidance in Chapter 2, Identifying HAIs.
- Patients suspected or known to have accessed their own IV lines are **not** excluded from CLABSI surveillance. A facility must protect the line as best they can. Prevention efforts may include providing a patient sitter and/or removal of the catheter as soon as is clinically possible.

Figure 1: Associating Central Line (CL) Use to BSI

	March 31 (Hospital day 3)	April 1	April 2	April 3	April 4	April 5	April 6
Patient A	Central Line **Day 3**	Central Line **Day 4**	Central Line removed **(CL Day 5)**	Central Line replaced **(CL Day 6)**	Central Line **Day 7**	Central Line removed **Day 8**	No Central Line
Patient B	Central Line **Day 3**	Central Line **Day 4**	Central Line removed **(CL Day 5)**	No Central Line	Central Line replaced (**CL Day 1)**	CL **Day 2**	CL **Day 3**

Rationale: NHSN surveillance for infection is not aimed at a specific device. Instead surveillance is aimed at identifying risk to the patient that is the result of device use in general.

- In the examples above, Patient A is eligible for a CLABSI beginning on March 31, through April 6, since a CL was in place for some portion of each calendar day until April 6. A BSI with date of event on April 6 would be a CLABSI since the CL had been in place greater than 2 days and was removed the day before the date of event.

- Patient B is eligible for a CLABSI on March 31 (CL Day 3) through April 3. The catheter had been in place > 2 days and an HAI occurring on the day of device discontinuation or the following calendar day is considered a device-associated infection.

Location of attribution: The inpatient location where the patient was assigned on the date of the LCBI event, which is further defined as the date when the first element used to meet the LCBI criterion occurred (see Exception to Location of Attribution below).

Inpatient Dialysis:
Inpatients receiving dialysis are included in any CLABSI surveillance in the location in which they are housed, regardless of whether or not the central line is the only central line and only accessed for dialysis. This also applies to patients in Long-Term Acute Care (LTAC) facilities within Acute Care Facilities when dialysis is received from the Acute Care Facility staff.

Examples: *CLABSIs in the following examples will be attributed to Unit A*

- Patient on Unit A receives onsite dialysis by contracted dialysis staff
- Dialysis staff travels to Unit A to provide dialysis to Unit A patient
- Patient resides on Unit A for inpatient care, but is transported to dialysis unit within the facility for dialysis. Since CLABSIs cannot be attributed to non-bedded locations, such an event must be attributed to the inpatient location housing the patient.

Facilities may choose to capture information about the presence of a dialysis catheter in patients with LCBIs. The BSI collection form includes a data field "Any hemodialysis catheter present," which may be marked yes or no, and utilized internally by facility to identify association of dialysis to LCBI.

Exception to Location of Attribution:

Transfer Rule: If the date of event for a CLABSI is the day of transfer or discharge, or the next day, the infection is attributed to the transferring location. Receiving facilities should share information about such HAIs with the transferring facility to enable reporting. This is called the Transfer Rule and examples are shown below and in Figure 2:

- Patient with a central line in place in the SICU is transferred to the surgical ward. On the next day, the patient meets criterion for an LCBI. This is reported to NHSN as a CLABSI for the SICU.
- Patient without a central line is transferred from the medical ward on hospital day 3 to MICU. Later that day a central line is inserted. The next day, LCBI criteria are met. This would be considered a BSI and attributed to the medical ward; however, it is not a CLABSI because the central line was not in place >2 days on the date of event.
- Patient with a central line in place is transferred from the medical ward to the coronary care ICU (CCU). After four days in the CCU, and with the central line still in place, LCBI criteria are met. This is reported to NHSN as a CLABSI for the CCU.
- After a two-week hospital stay, a patient on the urology ward of Hospital A has his only central line removed and is discharged home a few hours later. The IP from Hospital B calls the next day to report that this patient has been admitted to Hospital B and meets LCBI criteria. This CLABSI should be reported to NHSN for, and by, Hospital A and attributed to the urology ward.

Figure 2: Example of Multiple Transfers within the Transfer Rule Time-Frame

	3/22	3/23	3/24
Locations in which patient was housed	Unit A	Unit A Unit B Unit C	Unit C Unit D This is also the date of event for a CLABSI. CLABSI is attributed to Unit A since Unit A was the first location in which the patient was housed the day before the date of event.

Table 1: Laboratory-Confirmed Bloodstream Infection Criteria

Criterion	Laboratory-Confirmed Bloodstream Infection (LCBI)
	Comments and reporting instructions that follow the site-specific criteria provide further explanation and are integral to the correct application of the criteria. Must meet ***one*** of the following criteria:
LCBI 1	Patient has a recognized pathogen cultured from one or more blood cultures **AND** organism cultured from blood is not related to an infection at another site.(See Appendix 1 Secondary BSI Guide)
LCBI 2	Patient has at least one of the following signs or symptoms: fever (>38.0°C), chills, or hypotension **AND** organism cultured from blood is not related to an infection at another site (See Appendix 1 Secondary BSI Guide) **AND** the same common commensal (i.e., diphtheroids [*Corynebacterium* spp. not *C. diphtheriae*], *Bacillus* spp. [not *B. anthracis*], *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., and *Micrococcus* spp.) is cultured from two or more blood cultures drawn on separate occasions (see comment 3a below). Criterion elements must occur within the Infection Window Period (see Chapter 2), the seven-day time period which includes the date the positive blood culture was collected, the 3 calendar days before and the 3 calendar days after. (See complete list of common commensals by selecting the common commensal tab at the bottom of the Excel worksheet at http://www.cdc.gov/nhsn/XLS/master-organism-Com-Commensals-Lists.xlsx) **Note:** The matching common commensals represent a single element; therefore, the collection date of the **first** common commensal is the date of the element used to determine the Date of Event. 6/1/2014: *S. epidermidis* (1 of 2) — 6/2/2014: *S. epidermidis* (2 of 2) — 6/3/2014: No LCBI elements — 6/4/2014: Fever > 38.0 °C — Date of LCBI Event = 6/1/2014

LCBI 3	Patient ≤ 1 year of age has at least ***one*** of the following signs or symptoms: fever (>38.0°C), hypothermia (<36.0°C), apnea, or bradycardia **AND** organism cultured from blood is not related to an infection at another site (See Appendix 1 Secondary BSI Guide) **AND** the same common commensal (i.e., diphtheroids [*Corynebacterium* spp. not *C. diphtheriae*], *Bacillus* spp. [not *B. anthracis*], *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., and *Micrococcus* spp.) is cultured from two or more blood cultures drawn on separate occasions (see comment 3a below). Criterion elements must occur within the Infection Window Period, the seven-day time period which includes the date the positive blood culture was collected, the 3 calendar days before and the 3 calendar days after. (See complete list of common commensals by selecting the common commensal tab at the bottom of the Excel worksheet at http://www.cdc.gov/nhsn/XLS/master-organism-Com-Commensals-Lists.xlsx) **Note:** The matching common commensals represent a single element; therefore, the collection date of the ***first*** common commensal is the date of the element used to determine the Date of Event. **Example:** **LCBI 3** Patient ≤ 1 year of age has at least ***one*** of the following signs or symptoms: fever (>38.0°C), hypothermia (<36.0°C), apnea, or bradycardia **AND** organism cultured from blood is not related to an infection at another site (See Appendix 1 Secondary BSI Guide) **AND** the same common commensal (i.e., diphtheroids [*Corynebacterium* spp. not *C. diphtheriae*], *Bacillus* spp. [not *B. anthracis*], *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., and *Micrococcus* spp.) is cultured from two or more blood cultures drawn on separate occasions (see comment 3a below). Criterion elements must occur within the Infection Window Period, the seven-day time period which includes the date the positive blood culture was collected, the 3 calendar days before and the 3 calendar days after. (See complete list of common commensals by selecting the common commensal tab at the bottom of the Excel worksheet at http://www.cdc.gov/nhsn/XLS/master-organism-Com-Commensals-Lists.xlsx) **Note:** The matching common commensals represent a single element; therefore, the collection date of the ***first*** common commensal is the date of the element used to determine the Date of Event. **Example:**

6/1/2014	6/2/2014	6/3/2014	6/4/2014	Date of LCBI Event = 6/1/2014
S. epidermidis (1 of 2)	*S. epidermidis* (2 of 2)	No LCBI elements	apnea documented	

Criterion	**Mucosal Barrier Injury Laboratory-Confirmed Bloodstream Infection (MBI-LCBI)** *In 2015 when reporting an LCBI, it is required to indicate which of the underlying conditions of the MBI-LCBI criterion was met, if any. All CLABSI, whether LCBI or MBI-LCBI, must be reported if CLABSI is part of your Monthly Reporting Plan.* Must meet ***one*** of the following criteria:
MBI-LCBI 1	Patient of any age meets criterion 1 for LCBI with at least one blood culture growing any of the following intestinal organisms with no other organisms isolated (See Comment #5): *Bacteroides* spp., *Candida* spp., *Clostridium* spp., *Enterococcus* spp., *Fusobacterium* spp., *Peptostreptococcus* spp., *Prevotella* spp., *Veillonella* spp., or Enterobacteriaceae* **And patient meets at least *one* of the following:** 1. Is an allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood culture: a. Grade III or IV gastrointestinal graft versus host disease [GI GVHD] b. ≥1 liter diarrhea in a 24-hour period (or ≥20 mL/kg in a 24-hour period for patients <18 years of age) with onset on or within 7 calendar days before the date the positive blood culture was collected. 2. Is neutropenic, defined as at least two separate days with values of absolute neutrophil count (ANC) or total white blood cell count (WBC) <500 cells/mm^3 within a seven-day time period which includes the date the positive blood culture was collected (Day 1), the 3 calendar days before *and* the 3 calendar days after (See Table 4 for example). *See Table 3 for partial list of eligible Enterobacteriaceae genera.

MBI-LCBI 2	Patient of any age meets criterion 2 for LCBI when the blood cultures are growing only viridans group streptococci with no other organisms isolated **And patient meets at least *one* of the following:** 1. Is an allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood culture: a. Grade III or IV gastrointestinal graft versus host disease [GI GVHD] b. ≥1 liter diarrhea in a 24-hour period (or ≥20 mL/kg in a 24-hour period for patients <18 years of age) with onset on or within 7 calendar days before the date the first positive blood culture was collected. 2. Is neutropenic, defined as at least two separate days with values of absolute neutrophil count (ANC) or total white blood cell count (WBC) <500 cells/mm^3 within a seven-day time period which includes the date the positive blood culture was collected (Day 1), the 3 calendar days before *and* the 3 calendar days after (See Table 4 for example).
MBI-LCBI 3	Patient ≤1 year of age meets criterion 3 for LCBI when the blood cultures are growing only viridans group streptococci with no other organisms isolated **And patient meets at least *one* of the following:** 1. Is an allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood culture: a. Grade III or IV gastrointestinal graft versus host disease [GI GVHD] b. ≥20 mL/kg diarrhea in a 24-hour period with onset on or within 7 calendar days before the date the first positive blood culture is collected. 2. Is neutropenic, defined as at least two separate days with values of absolute neutrophil count (ANC) or total white blood cell count (WBC) <500 cells/mm^3 on or within a seven-day time period which includes the date the positive blood culture was collected (Day 1), the 3 calendar days before *and* the 3 calendar days after. (See Table 4 for example)
Comments	1. In LCBI criterion 1, the term "recognized pathogen" includes any organism not included on the common commensal list (see criteria 2 and 3 or Supporting Material section at

	http://www.cdc.gov/nhsn/acute-care-hospital/clabsi/index.html for the list of common commensals). 2. LCBI criteria 1 and 2 and MCI-LCBI criteria 1 and 2 may be used for patients of any age, including those patients ≤1 year of age. 3. In LCBI criteria 2 and 3, if the pathogen or common commensal is identified to the species level from one blood culture, and a companion blood culture is identified with only a descriptive name, which is complementary to the companion culture (e.g., to the genus level), then it is assumed that the organisms are the same. The organism identified to the species level should be reported as the infecting organism along with its antibiogram if available (see Table 2 below). Only genus and species identification should be utilized to determine the sameness of organisms (i.e., matching organisms). No additional comparative methods should be used (e.g., morphology or antibiograms) because laboratory testing capabilities and protocols may vary between facilities. This will reduce reporting variability, solely due to laboratory practice, between facilities reporting LCBIs meeting criterion 2. Report the organism to the genus/species level only once, and if antibiogram data are available, report the results from the most resistant panel. a. In LCBI criteria 2 and 3, the phrase "two or more blood cultures drawn on separate occasions" means, 1) that blood from at least two separate blood draws were collected on the same or consecutive calendar days, and 2) were collected in a manner which suggests that 2 separate blood draw site preparations were performed. This will reduce misidentification of contaminated blood cultures as LCBI. For example, blood cultures drawn from different sites (e.g., different venipunctures, a combination of venipuncture and lumen withdrawal, or different lumens of the same central line) should undergo separate decontaminations and are therefore considered drawn on "separate occasions". b. For pediatric patients, due to volume constraints, a blood culture may consist of a single bottle. Therefore, to meet this part of the criterion, each bottle from two, single bottle blood draws would have to be culture-positive for the same commensal. 4. Specimen Collection Considerations: Although blood cultures drawn through central lines can have a higher rate of contamination than blood cultures collected through peripheral venipuncture [3, 4] all positive blood cultures, regardless of the sites

	from which they were collected, must be included when conducting in-plan CLABSI surveillance. 5. In MBI-LCBI 1, 2 and 3, "No other organisms isolated" means there is not isolation in a blood culture of another recognized pathogen (e.g., *S. aureus*) or common commensal (e.g., coagulase-negative staphylococci) other than listed in MBI-LCBI criterion 1, 2 or 3 that would otherwise meet LCBI criteria. If this occurs, the infection should not be classified as MBI-LCBI.
Reporting Instructions	1. Report organisms cultured from blood as BSI–LCBI when no other site of infection is evident (see Appendix 1. Secondary Bloodstream Infection [BSI] Guide). 2. When another blood culture is collected during the RIT of an identified MBI-LCBI, which is positive for an organism excluded from MBI-LCBI criteria, the MBI-LCBI event is edited to become an LCBI and the organism is added. 3. Catheter tip cultures are not used to determine whether a patient has a primary BSI. 4. When there is a positive blood culture and clinical signs or symptoms of localized infection at a vascular access site, but no other infection can be found, the infection is considered a primary BSI. 5. Purulent phlebitis confirmed with a positive semiquantitative culture of a catheter tip, **but with either negative or no blood culture** is considered a CVS-VASC, not a BSI, SST-SKIN, or a ST infection. 6. Occasionally, a patient with both peripheral and central IV lines develops a primary bloodstream infection (LCBI) that can clearly be attributed to the peripheral line (i.e., pus at the insertion site and/or matching pathogen from pus and blood). In this situation, enter "Central Line = No" in the NHSN application. You should, however, include the patient's central line days in the summary denominator count. 7. If your state or facility requires that you report healthcare-associated BSIs that are not central line-associated, enter "Central Line = No" in the NHSN application when reporting these BSIs. You should, however, include all of the patient's central line days in the summary denominator count.

Table 2: Examples of How to Report Speciated and Unspeciated Organisms Isolated from Blood Cultures

Culture Report	**Companion Culture Report**	**Report as…**
Coagulase-positive staphylococci	*S. aureus*	*S. aureus*
S. epidermidis	Coagulase-negative staphylococci	*S. epidermidis*
Enterococcus spp.	*E. faecium*	*E. faecium*
Bacillus spp. (not *anthracis*)	*B. cereus*	*B. cereus*
S. salivarius	Strep viridans	*S. salivarius*

Table 3: Partial List of Criterion 1 MBI-LCBI Eligible Enterobacteriaceae Genera

Citrobacter
Enterobacter
Escherichia
Klebsiella
Proteus
Providencia
Salmonella
Serratia
Shigella
Yersina

Note: See complete list of MBI Pathogens by selecting the MBI Organisms tab at the bottom of the Excel worksheet at http://www.cdc.gov/nhsn/XLS/master-organism-Com-Commensals-Lists.xlsx

Table 4: Examples Illustrating the MBI-LCBI Criteria for Neutropenia

		Day -7	Day -6	Day -5	Day -4	Day -3	Day -2	Day -1	Day 1*	Day 2	Day 3	Day 4
Pt. A	**WBC**	**100**	**800**	**400**	**300**	**ND**	**ND**	**320**	**400 + BC* w/ *Candida* spp. x1**	**ND**	**550**	**600**
Pt. B	**ANC**	**ND**	**410**	**130**	**ND**	**ND**	**120**	**110**	**ND +BC* w/ viridans strep x2 and fever >38°C**	**110**	**300**	**320**
Pt. C	**WBC**	**100**	**800**	**400**	**300**	**ND**	**ND**	**ND**	**600 + BC* w/ *Candida* spp. x1**	**230**	**ND**	**400**

*ND = not done; *Day the blood specimen that was positive was collected*

Patient A meets MBI-LCBI criterion 1, sub-criterion 2: Positive blood culture with intestinal organism (*Candida* spp.) and neutropenia (2 separate days of WBC <500 cells/mm^3 occurring on the date the positive blood culture was collected [Day 1] or during the 3 days before or the 3 days after that date). In this case, the Day 1 value = 400, and Day -1 value = 320.

Patient B meets MBI-LCBI criterion 2, sub-criterion 2: At least two positive blood cultures with viridans group streptococci (in this case, two positive), and fever >38°C and neutropenia (two separate days of ANC <500 cells/mm^3 occurring on the date the positive blood culture was collected [Day 1] or during the 3 days before or the 3 days after that date). In this case, the Day -1 value = 110 and Day -2 value = 120.

Note: any two of Days -2,-1, 2, 3, and 4 could be used to meet this requirement since WBC or ANC under 500 were present on those days.

Patient C meets MBI-LCBI criterion 1, sub-criterion 2: Positive blood culture with intestinal organism (*Candida* spp.) and neutropenia (2 separate days of WBC <500 cells/mm^3 occurring on the date the positive blood culture was collected [Day 1] or during the 3 days before or the 3 days after that date). In this case, Day 2 value =230 and Day 4value = 400]).

Numerator Data: The *Primary Bloodstream Infection (BSI)* form (CDC 57.108) is used to collect and report each CLABSI that is identified during the month selected for surveillance. The Instructions for Completion of Primary Bloodstream Infection (BSI) form contains brief instructions for collection and entry of each data element on the form. The *Primary BSI* form includes patient demographic information and whether a central line was present, and, if so, the type of central line the patient had if appropriate to the location; these data will be used to calculate line-specific infection rates. Additional data include the specific criteria met for identifying the primary BSI, whether the patient died, the organisms isolated from blood cultures, and the organisms' antimicrobial susceptibilities.

Reporting Instruction:
If no CLABSIs are identified during the month of surveillance, the "Report No Events" box must be checked on the appropriate denominator summary screen, e.g., Denominators for Intensive Care Unit (ICU)/other locations (Not NICU or SCA), etc.

Denominator Data: Device days and patient days are used for denominators. Device-day denominator data that are collected differ according to the location of the patients being monitored. The following methods can be used for the collection of denominator data:

Denominator Data Collection Method	**Details**
Manual, Daily (i.e., collected at the same time every day of the month)	Denominator data are collected at the same time, every day, per location. For locations other than specialty care areas/oncology (SCA/ONC) and NICUs, the number of patients with one or more central lines of any type is collected daily, at the same time each day, during the month and recorded on the *Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU or SCA/ONC)* form (CDC 57.118). Only the totals for the month are entered into NHSN. For specialty care areas/oncology, the number of patients with one or more central lines is dichotomized into those with permanent central lines and those with temporary central lines on the *Denominators for Specialty Care Area (SCA)/Oncology (ONC)* form (CDC 57.117). Each is collected daily, at the same time each day. Only the totals for the month are entered into NHSN. This distinction in lines is made because permanent lines are commonly used in patients frequenting these areas and may be associated with lower rates of BSI than central lines inserted for

Denominator Data Collection Method	Details
	temporary use. If a patient has both a temporary and a permanent central line, count the day only as a temporary line day. The Instructions for Completion of Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU and SCA/ONC) and Instructions for Completion of Denominators for Specialty Care Areas (SCA)/Oncology (ONC) contain brief instructions for collection and entry of each data element on the forms. In NICUs, the number of patients with one or more central lines is stratified by birth weight in five categories since risk of BSI varies by birth weight. These data are collected on the *Denominators for Neonatal Intensive Care Unit (NICU)* form (CDC 57.116). **Note:** The weight of the infant at the time of BSI is not used and should not be reported. For example, if a neonate weighs 1006 grams at birth but remains in the NICU for two months and has a body weight of 1650 grams when a CLABSI develops, record the birth weight of 1006 grams on the BSI form. The Instructions for Completion of Denominators for Neonatal Intensive Care Unit (NICU) form contains brief instructions for collection and entry of each data element on the forms.
Manual, sampled once/week (i.e., collected at the same time on the same designated day, once per week)	For locations other than specialty care areas/oncology (SCA/ONC) and NICUs (e.g., ICUs, step-down units, wards), the denominator sampling method can be used. To reduce staff time spent collecting surveillance data, once weekly sampling of denominator data to generate estimated central line days, may be used as an alternative to daily collection in non-oncology ICUs and wards. The number of patients in the location (patient-days) and the number of patients with one or more central lines of any type (central line days) is collected on a designated day each week (e.g., every Tuesday), at the same time during the month. Evaluations of this method have repeatedly shown that use of Saturday or Sunday generate the least accurate estimates of denominator data, therefore, these days should not be selected as the designated day.[6-8] If the day designated for the collection of sampled data is missed, collect the data on the next available day instead.

Denominator Data Collection Method	Details
	The following must be collected and entered into NHSN: 1. The monthly total for patient-days, based on collection daily 2. The sampled total for patient-days 3. The sampled total central line-days When these data are entered, the NHSN application will calculate an estimate of central line-days. **Notes:** • To ensure the accuracy of estimated denominator data obtained by sampling, only ICU and ward location types with an average of 75 or more central line-days per month are eligible to use this method. A review of each location's central line denominator data for the past twelve months in NHSN will help determine which locations are eligible. • The accuracy of estimated denominator data generated by sampling can be heavily influenced by incorrect or missing data. Careful implementation of data collection following the guidance in this protocol is essential to avoid erroneous fluctuations in rates or SIRs.
Electronic	For <u>any</u> location, when denominator data are available from electronic sources (e.g., central line days from electronic charting), these sources may be used as long as the counts are not substantially different (+/- 5%) from manually-collected, once a day counts, pre-validated for a minimum of three months. The validation of electronic counts should be performed for each location separately.

Data Analyses: The Standardized Infection Ratio (SIR) [9] is calculated by dividing the number of observed infections by the number of predicted infections. The number of predicted infections is calculated using CLABSI rates from a standard population during a baseline time period, which represents a standard population's CLABSI experience.[10, 11]
Note: The SIR will be calculated only if the number of predicted CLABSIs (numExp) is ≥1 to help enforce a minimum precision criterion.

Note: In the NHSN application, "predicted" is referred to as "expected".

$$SIR = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

While the CLABSI SIR can be calculated for single locations, the measure also allows you to summarize your data across multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you can obtain one CLABSI SIR adjusting for all locations reported. Similarly, you can obtain one CLABSI SIR for all ICUs in your facility.

Note: Only those locations for which baseline data have been published will be included in the SIR calculations. For acute care hospitals, the baseline time period is 2006-2008; for long term acute care hospitals, the baseline time period is 2013.[10,11]

The CLABSI rate per 1000 central line days is calculated by dividing the number of CLABSIs by the number of central line days and multiplying the result by 1000. The Central Line Utilization Ratio is calculated by dividing the number of central line days by the number of patient days. These calculations will be performed separately for different types of ICUs, specialty care areas, oncology units, and other locations in the institution. Separate rates and ratios will also be calculated for different types of catheters in specialty care areas/oncology locations and for birth weight categories in NICUs.

Descriptive analysis output options of numerator and denominator data, such as line listings, frequency tables, and bar and pie charts are available in the NHSN application. CLABSI SIRs, rates, and run charts are also available. Guides on using NHSN analysis features are available from: http://www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html.

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Appendix1: Secondary Bloodstream Infection (BSI) Guide (*not applicable to Ventilator-associated Events [VAE]*)

What is the meaning of the statement "not related to infection at another site" in relation to a positive blood culture?

The purpose of using the CDC/NHSN infection criteria is to identify and consistently categorize infections that are healthcare-associated into major and specific infection sites or types. LCBI criteria include the caveat that the organism(s) cultured from the blood cannot be related to infection at another site (i.e., must be a primary BSI). One must be sure that there is no other CDC-defined primary site of infection that may have seeded the bloodstream secondarily; otherwise the bloodstream infection may be misclassified as a primary BSI and erroneously associated with the use of a central line, i.e., called a CLABSI. For locations performing in-plan VAE surveillance, refer to Figure 4 in this appendix, as well as the VAE chapter for specific guidance on assigning a secondary BSI to a VAE.

For purposes of NHSN, in order for a bloodstream infection to be determined to be secondary to a primary infection site, (i.e. related to an infection at another site, such that the primary site of infection may have seeded the bloodstream secondarily), the patient must meet all three‡ below:

1. **Meet one of the NHSN site specific definitions (CDC/NHSN Surveillance Definitions for Specific Types of Infections),**
2. **Have a positive blood culture within the Secondary BSI Attribution Period (See Chapter 2),**
   AND
3. **Meet requirements in Secondary BSI Scenario 1 or 2 below.**

‡**Exception:**
Since necrotizing enterocolitis (NEC) criteria include neither a site specific culture nor a positive blood culture, an exception for assigning a BSI secondary to NEC is provided. A BSI is considered secondary to NEC if the patient meets one of the two NEC criteria **AND** a positive blood culture(s) collected during the secondary BSI attribution period is positive for an LCBI pathogen or the same common commensal is cultured from two or more blood cultures drawn on separate occasions collected on the same or consecutive days.

Secondary BSI Scenarios

Below are two potential scenarios with guidance on how to distinguish between the primary or secondary nature of a BSI. The definition of "matching organisms", and important notes and reporting instructions are also provided.

See Figure 3: Secondary BSI Guide for algorithmic display of the following instructions.

Scenario 1: Blood and site-specific specimen cultures match for at least one organism: In a patient suspected of having an infection, if blood and a site-specific specimen are collected for culture and both are positive for at least one matching organism, AND if the site-specific culture is an element used to meet the infection site criterion, the BSI is considered secondary to that site-specific infection.

a. **Example:** Patient meets HAI criteria for a symptomatic urinary tract infection (suprapubic tenderness and $>10^5$ CFU/ml of *E. coli*) and blood culture collected during the secondary BSI attribution period is positive for *E. coli*. This is an HAI SUTI with a secondary BSI and the reported organism is *E. coli*.
b. **Example:** Patient meets HAI criteria for a symptomatic urinary tract infection (suprapubic tenderness and $>10^5$ CFU/ml of *E. coli*) and blood culture collected during the SUTI secondary BSI attribution period grows *E. coli* and *P. aeruginosa*. This is an HAI SUTI with a secondary BSI and the reported organisms are *E. coli* and *P. aeruginosa*, since both site and blood culture are positive for at least one matching pathogen.
c. **Example:** Patient meets HAI criteria for a symptomatic urinary tract infection (suprapubic tenderness and $>10^5$ CFU/ml of *E. coli*) and blood culture collected during the SUTI secondary BSI attribution period *E. coli* and *S. epidermidis*. This is an HAI SUTI with a secondary BSI and the reported organism is only *E. coli*, since the single common commensal *S. epidermidis* positive blood culture by itself does not meet BSI criteria.

Scenario 2: Blood and site-specific specimen cultures do <u>not</u> match: There are two scenarios that can occur when a patient suspected of having an infection has blood and a site-specific specimen cultured but the organisms do not match.

a. If the blood isolate is an element used to meet the site-specific criterion, then the BSI is considered secondary to that site-specific infection. (For your convenience, a list of infection criterions that include positive blood culture as an element are included in Table 5 below).

    i. **Example:** Postoperative patient becomes febrile and complains of nausea and abdominal pain. Blood and an aseptically-obtained T-tube drainage specimen are collected for culture. A CT scan done that day shows fluid collection suggestive of infection. Culture results show *Escherichia coli* from the T-tube drainage specimen

but the blood grows *Bacteroides fragilis.* Because the patient meets IAB criteria during the infection window period, by positive site-specific culture (IAB criterion 3a) and by positive blood culture as an element of a different criterion of the same infection site (IAB 3b), the blood is considered a secondary BSI to an IAB and both organisms would be listed as the IAB infection pathogens. No primary BSI would be reported.

ii. **Example:** Patient is febrile, has a new onset of cough and has positive chest radiographs indicating the presence of an infiltrate. Blood and bronchoalveolar lavage (BAL) cultures are collected. Culture results show *Klebsiella pneumoniae* > 10^4 cfu/ml from the BAL and *Pseudomonas aeruginosa* from the blood. Because the patient can meet PNU2 definition by using the positive blood culture as one of the elements of the infection criterion (i.e. infiltrate on chest x-rays, fever, new onset of cough and positive blood culture), the blood is considered a secondary BSI to a PNEU. No primary BSI would be reported.

b. If the site-specific culture is an element used to meet the infection site criterion and the blood isolate is not, then the BSI is considered a primary infection.

iii. **Example:** Postoperative patient has an intraabdominal abscess (IAB) noted during reoperation and purulent material is obtained at that time which grows Escherichia coli. The patient spikes a fever two days later and blood culture shows *Bacteroides fragilis*. Because the organisms from the site and blood cultures do not match, and no site-specific criterion that includes positive blood culture as an element is met, both a site-specific infection (GI-IAB criteria 1 and 2) and a primary BSI would be reported.

iv. **Example:** Unconscious ICU patient with a Foley catheter and central line for past four days spikes a fever; blood, urine and sputum specimens are collected for culture. The urine culture grows >100,000 CFU/ml of *Escherichia coli*, blood culture grows Enterococcus faecium, and sputum shows oral flora only. Because the organisms from the urine and blood cultures do not match, and a UTI criterion that includes positive blood culture as an element is not met, both a SUTI (SUTI criterion 1a) and a primary BSI would be reported. This infection does not meet the ABUTI criterion since that requires at least one matching organism in urine and blood in an asymptomatic patient.

Table 5: Site-specific criteria that require blood cultures

Organisms cultured from blood as an element

Site	Element	Page
BURN	1	17-20
JNT	3c	17- 5
MEN	2c & 3c	17-7
OREP	3a	17-19
PNU2	Lab finding	6-6
PNU3	Lab finding	6-8
UMB	1b	17-22

Organisms cultured from blood <u>with</u> imaging test evidence of infection

Site	Element	Page
BONE	3a	17-4
DISC	3a	17-4
GIT	2c	17-16
IAB	3b	17-17
SA	3a	17-8
USI	3b & 4b	17-23
ENDO	*4*a, 4b, 5a & 5b (specific organisms) 6e & 7e plus other criteria as listed	17-9

A **matching organism** is defined as one of the following:

1. If genus and species are identified in both cultures, they must be the same.
    a. **Example:** A blood culture reported as *Enterobacter cloacae* and an intraabdominal specimen of *Enterobacter cloacae* are matching organisms.
    b. **Example:** A blood culture reported as *Enterobacter cloacae* and an intraabdominal specimen of *Enterobacter aerogenes* are NOT matching organisms as the species are different.

2. If the organism is less definitively identified in one culture than the other, the identifications must be complementary.
    a. **Example:** A surgical wound growing *Pseudomonas* spp. and a blood culture growing *Pseudomonas aeruginosa* are considered a match at the genus level and therefore the BSI is reported as secondary to the SSI.
    b. **Example:** A blood culture reported as *Candida albicans* and a culture from a decubitus reported as yeast are considered to have matching organisms because the organisms are complementary, i.e. Candida is a type of yeast.

Notes:

- Antibiograms of the blood and potential primary site isolates do not have to match.
- If the blood isolate by itself does not meet BSI criteria (e.g., only one positive blood culture of a common commensal), then that isolate may not be used to indicate the presence of a secondary BSI (see scenario1c).

Reporting Instructions:

- For reporting secondary BSI for possible PVAP, see Figure 4 and Chapter 10.
- Do not report secondary bloodstream infection for vascular (VASC) infections, Ventilator-Associated Conditions (VAC), or Infection-related Ventilator-Associated Complications (IVAC), pneumonia 1 (PNEU 1).

Pathogen Assignment

Pathogens cultured from secondary BSIs, should be added to those pathogens reported for the primary infection type. The Secondary BSI data collection field should be checked yes.

A secondary BSI pathogen may be assigned to two different primary site infections (e.g., UTI and an IAB infection). Two primary site infections have been identified and a blood culture is collected within both the SUTI and the IAB secondary BSI attribution period. The blood culture pathogen matches both primary site infection pathogens. Therefore the pathogen is reported for both primary sites as a secondary bloodstream infection.

Example 1: Pathogen Assignment

Hospital Day	BSI	RIT	Infection Window Period	Infection Window Period		BSI
1						
2						
3						
4		1	**Urine culture**: >100,000 cfu/ml *K. pneumoniae*			
5		2	Fever >38.0 C			
6		3				
7		4				
8		5		Fever >38.0 C, Abdominal pain		
9		6		CT Scan : Abdominal abscess		
10		7	**Blood culture**: *K. pneumoniae*	Blood culture: *K. pneumoniae*		
11		8				
12		9				
13		10				
14		11				
15		12				
16		13				
17		14				
18						
19						
20						
21						
22						
23						
			SUTI & Secondary BSI **Date of Event = 4** **Pathogen: *K. pneumoniae***	**IAB & Secondary BSI** **Date of Event = 8** **Pathogen: *K. pneumoniae***		

Infection Window Period
(First positive diagnostic test, 3 days before and 3 days after)

Repeat Infection Timeframe (RIT)
(date of event = day 1)

Secondary BSI Attribution Period (Infection Window Period + RIT)

Date of Event (DOE)
(Date the first element occurs for the first time within the infection window period)

Pathogens excluded from specific infection definitions (e.g., yeast in UTI, or Enterococcus spp. for PNEU) are also excluded as pathogens for BSIs secondary to that type of infection (i.e., they cannot be added on to one of these infections as a pathogen). The excluded organism must be accounted for as either 1) a primary bloodstream infection (BSI/CLABSI) or, 2) a secondary bloodstream infection attributed to another primary infection (e.g., IAB, SINU). A blood culture with yeast and *E. faecalis* is collected during the SUTI RIT. A BSI secondary to SUTI is identified. *E. faecalis* is already documented as a pathogen, but the yeast will not be reported as a secondary BSI pathogen, because yeasts are excluded as organisms in the UTI definition. Because no other primary source of infection for which the yeast BSI can be assigned as secondary is found, a primary BSI with yeast is identified.

Example 2: Pathogen Assignment (continued)

Infection Window Period
(First positive diagnostic test, 3 days before and 3 days after)

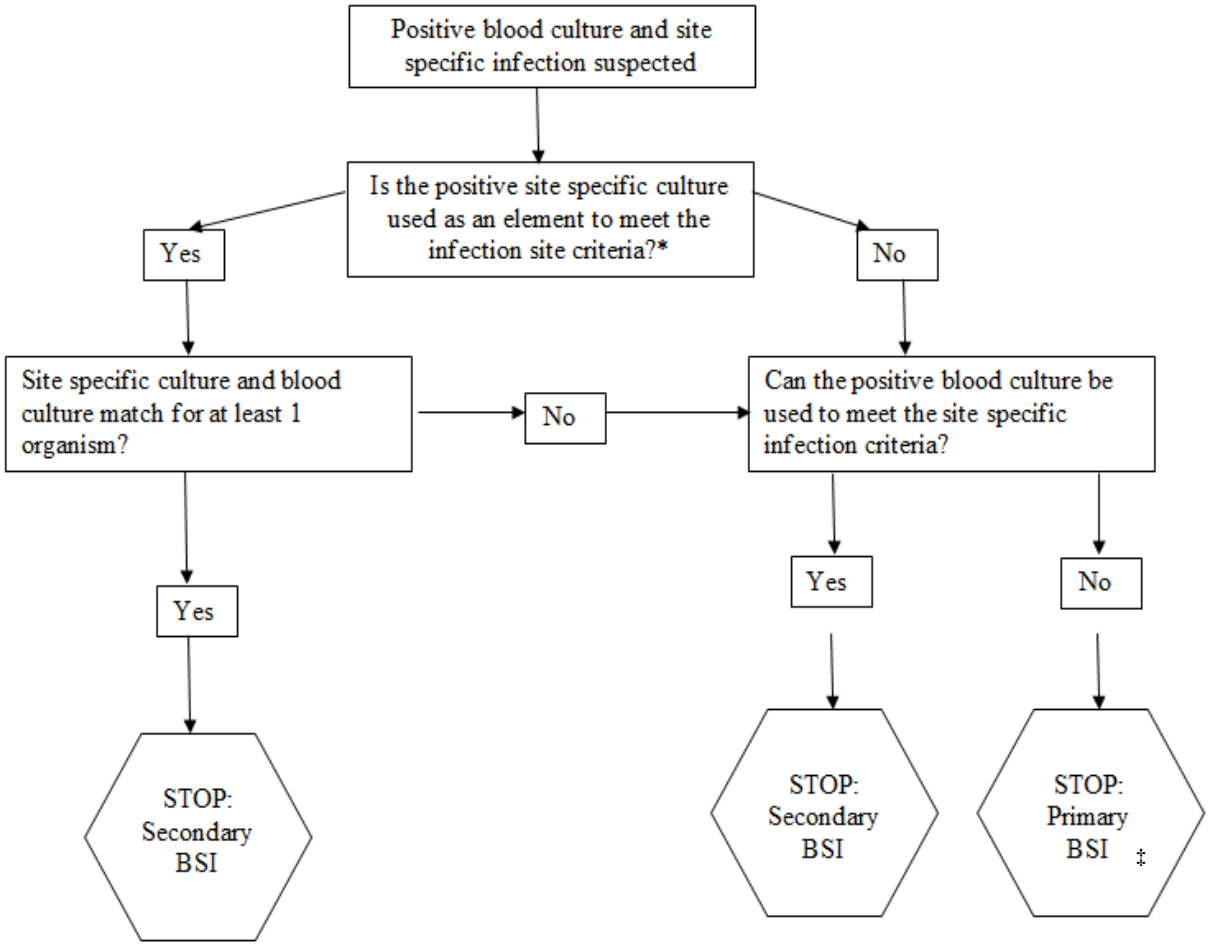
Repeat Infection Timeframe (RIT)
(date of event = day 1)

Secondary BSI Attribution Period
(Infection Window Period + RIT)

Date of Event (DOE)
(Date the first element occurs for the first time within the infection window period)

Hospital Day	BSI	RIT	Infection Period	Infection Window Period	RIT
1					
2					
3		1	Dysuria		
4		2	**ture**: cfu/ml s		
5		3			
6		4			
7		5			
8		6			
9		7			
10		8			
11		9	**ture:** / Yeast	**Blood culture:** *E. faecalis* / Yeast	1
12		10			2
13		11			3
14		12			4
15		13			5
16		14			6
17					7
18					8
19					9
20					10
21					11
22					12
23					13
24					14
25					
			UTI & Secondary BSI **Date of Event = 3** **Pathogen: *E. faecalis***	**Primary BSI** **Date of Event = 11** **Pathogen: Yeast**	

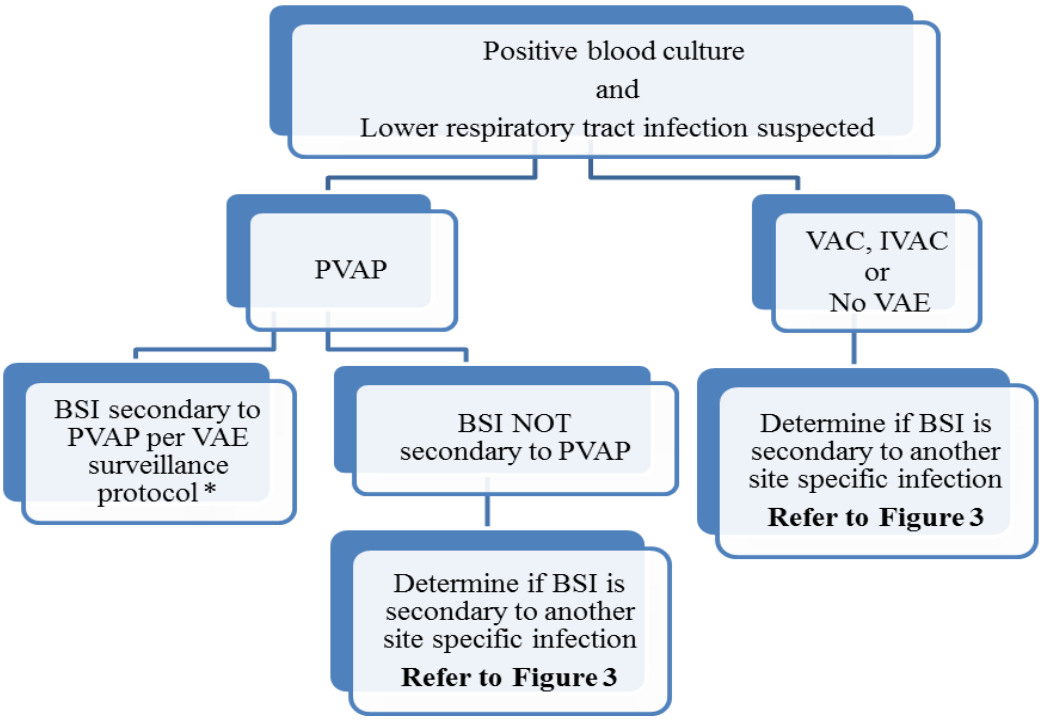
Figure 3: Secondary BSI Guide for eligible organisms*‡
(Not applicable to Ventilator-associated Events [VAE], See Figure 4)



*If an organism is excluded as a causative agent for a site specific infection (i.e. yeast in UTI), the blood cannot be considered secondary to that site.

‡**Exception:** Since necrotizing enterocolitis (NEC) criteria include neither a site specific culture nor a positive blood culture, an exception for assigning a BSI secondary to NEC is provided. A BSI is considered secondary to NEC if the patient meets one of the 2 NEC criteria AND a positive blood culture(s) collected during the secondary BSI attribution period is positive for an LCBI pathogen or the same common commensal is cultured from 2 or more blood cultures drawn on separate occasions collected on the same or consecutive days.

Figure 4: VAE Guidance for Secondary BSI Determination



*Secondary BSIs may be reported for possible VAP (PVAP) events, provided that at least one organism isolated from the blood culture matches an organism isolated from an appropriate respiratory tract specimen (including respiratory secretions, pleural fluid and lung tissue). The respiratory tract specimen must have been collected on or after the 3rd day of mechanical ventilation and within 2 calendar days before or after the day of onset of worsening oxygenation to be considered as a criterion for meeting the PVAP definitions. In addition, the positive blood culture must have been collected during the 14-day event period, where day 1 is the day of onset of worsening oxygenation.

- In cases where PVAP is met with only the histopathology criterion and no culture is performed, and there is also a positive blood culture, a secondary BSI to VAE is not reported.
- In cases where a culture of respiratory secretions, pleural fluid or lung tissue is performed and does not grow an organism that matches an organism isolated from blood, a secondary BSI to VAE is not reported.

Note: Candida species or yeast not otherwise specified, coagulase-negative Staphylococcus species, and Enterococcus species cultured from blood cannot be deemed secondary to a PVAP, unless the organism was also cultured from pleural fluid or lung tissue.

Instructions for Completion of Primary Bloodstream Infection (BSI) Form (CDC 57.108)

Data Field	Instructions for Data Collection
Facility ID	The NHSN-assigned facility ID will be auto-entered by the computer.
Event #	Event ID number will be auto-entered by the computer.
Patient ID	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID	Optional. Enter the alphanumeric ID number assigned by the facility.
Medicare #	Conditionally required. Enter the patient's Medicare number for all events reported as part of a CMS Quality Reporting Program.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Check Female, Male, or Other to indicate the gender of the patient.
Date of Birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity	Optional. Specify if the patient is either Hispanic or Latino, or Not Hispanic or Not Latino.
Race	Optional. Specify one or more of the choices below to identify the patient's race: American Indian/Alaska Native Asian Black or African American Native Hawaiian/Other Pacific Islander White
Event type	Required. BSI.
Date of event	Required. The date when the first element used to meet the BSI infection criterion occurred for the first time, during the Infection Window Period. Enter date of this event using this format: MM/DD/YYYY. **NOTE:** If a device has been pulled on the first day of the month in a location where there are no other device days in that month, and a device-associated infection develops after the device is pulled, use the last day of the previous month as the Date of Event.
Post-procedure BSI	Optional. Check Y if this event occurred after an NHSN-defined procedure but before discharge from the facility, otherwise check N.
NHSN procedure code	Conditionally required. If Post-procedure BSI = Y, enter the appropriate NHSN procedure code. **NOTE:** A BSI cannot be "linked" to an operative procedure unless that procedure has already been added to NHSN. If the procedure was previously added, and the "Link to Procedure" button is clicked, the fields pertaining to the operation will be auto-entered by the computer.

Data Field	Instructions for Data Collection
ICD-9-CM procedure code	Optional. The ICD-9-CM code may be entered here instead of (or in addition to) the NHSN Procedure Code. If the ICD-9-CM code is entered, the NHSN code will be auto-entered by the computer. If the NHSN code is entered first, you will have the option to select the appropriate ICD-9-CM code. In either case, it is optional to select the ICD-9-CM code. Only those ICD-9-CM codes identified in Table 1 of the Surgical Site Infection Event Chapter (Chapter 9 of NHSN Manual: Patient Safety Component Protocol) are allowed. **NOTE:** ICD-10-CM/PCS codes will replace ICD-9-CM codes on October 1, 2015 however NHSN will not have the ability to receive these codes until the January 2016 release. The NHSN guidance for entry of surgical denominator data for the last quarter of 2015 data is to enter the NHSN Procedure Code (e.g. COLO or HYST) but do not enter any ICD-10-CM/PCS codes associated with the procedure.
MDRO Infection Surveillance	Required. Enter "Yes", if the pathogen is being followed for Infection Surveillance in the MDRO/CDI Module in that location as part of your Monthly Reporting Plan: MRSA, MSSA (MRSA/MSSA), VRE, CephR-*Klebsiella*, CRE (*E. coli*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, or *Enterobacter*), MDR-*Acinetobacter*, or *C. difficile*. If the pathogen for this infection happens to be an MDRO but your facility is not following the Infection Surveillance in the MDRO/CDI Module in your Monthly Reporting Plan, answer "No" to this question.
Location	Required. Enter the inpatient location to which the patient was assigned on the date of the BSI event. If the date of BSI occurs on the day of transfer or discharge from a location or the next day, indicate the transferring/discharging location, not the current location of the patient, in accordance with the Transfer Rule (see Key Terms section).
Date admitted to facility	Required. Enter date patient admitted to an inpatient location using this format: MM/DD/YYYY. • When determining a patient's admission dates to both the facility and specific inpatient location, the NHSN user must take into account all such days, including any days spent in an inpatient location as an "observation" patient before being officially admitted as an inpatient to the facility, as these days contribute to exposure risk. Therefore, all such days are included in the counts of admissions and patient days for the facility and specific location, and facility and admission dates must be moved back to the first day spent in the inpatient location. • When reporting a BSI which occurs on the day of or day after discharge use the previous date of admission as admission date.

Data Field	Instructions for Data Collection
Risk Factors: If ICU/Other locations, central line	Required. Answer this question if the location is an intensive care unit (ICU) or location other than a specialty care area (SCA) or neonatal intensive care unit (NICU). Check Y if patient had a central line (CL) present for more than 2 calendar days on the date of event or the day before otherwise, check N. Day of device insertion = Day 1 **NOTE:** If the patient has both a peripheral and a central line and the BSI can clearly be attributed to the peripheral line (e.g., pus at insertion site and matching pathogen from pus and blood), check N.
Risk Factors: If Specialty Care Area/Oncology, Permanent central line Temporary central line	Required. Answer these questions if the location is an SCA or oncology location: Check Y if patient had a tunneled or implanted central line (CL) present for more than 2 calendar days on the date of event or the day before otherwise, check N. Day of device insertion = Day 1 Check Y if patient had a non-tunneled or non-implanted central line (CL) present for more than 2 calendar days on the date of event or the day before otherwise, check N. Day of device insertion = Day 1 **NOTE:** If the patient has both a central line and a vascular line that is not a central line (e.g., peripheral line, arterial line, etc.), and the BSI can clearly be attributed to the non-central line (e.g., pus at insertion site and matching pathogen from pus and blood), check N.
Risk Factors: If NICU, Central line Birth weight	Required. Answer these questions if the location is an NICU: Check Y if patient had a central line (CL) or umbilical catheter (UC) present for more than 2 calendar days on the date of event or the day before otherwise, check N. Day of device insertion = Day 1 Required. Enter patient's weight at the time of birth in grams, <u>not</u> the weight on the date of event. **NOTE:** If the patient has both a peripheral and a central line and the BSI can clearly be attributed to the peripheral line (e.g., pus at insertion site and matching pathogen from pus and blood), check N.
Any hemodialysis catheter present	Optional. Check Y if the patient had any central line in place for the purpose of hemodialysis. Check N if the patient had no central line in place for the purpose of hemodialysis. If the patient has >1 central line at the time of the

Data Field	Instructions for Data Collection
	event, check Y if any were in place for the purpose of hemodialysis. There is no requirement for this central line to have been accessed to check Y.
Location of device insertion	Optional. Enter the patient location where the central line was inserted. • If the patient has more than one central line, enter the location where the first central line was inserted. • If the patient has both a permanent and a temporary central line, enter the location where the temporary line was inserted.
Date of device insertion	Optional. Enter the date the central line was inserted. If the patient has more than one central line, facility may choose which insertion date to record.
Event Details: Specific event	Required. Check Laboratory-confirmed (LCBI).
Event Details: Specify criteria used:	Required. Check each of the elements of the criterion that were met.
Event Details: Died	Required. Check Y if patient died during the hospitalization, otherwise check N.
Event Details: BSI contributed to death	Conditionally required if patient died. Check Y if such evidence is available (e.g., death/discharge note, autopsy report, etc.) otherwise check N.
Event Details: Discharge date	Optional. Date patient discharged from facility using this format: MM/DD/YYYY.
Event Details: Pathogen identified	Required. This field will be auto entered by the computer as Y. Specify pathogens on reverse of form.
Pathogen # for specified Gram-positive Organisms, Gram-negative Organisms, Fungal Organisms, or Other Organisms	Up to three pathogens may be reported. If multiple pathogens are identified, enter the pathogen judged to be the most important cause of infection as #1, the next most as #2, and the least as #3 (usually this order will be indicated on the laboratory report). If the species is not given on the lab report or is not found on the NHSN drop down list, then select the "spp" choice for the genus (e.g., *Bacillus natto* is not on the list so would be reported as *Bacillus* spp.).
Antimicrobial agent and susceptibility results	Conditionally required if Pathogen Identified = Y. • For those organisms shown on the back of an event form, susceptibility results are required only for the agents listed. • For organisms that are not listed on the back of an event form, the entry of susceptibility results is optional. Circle the pathogen's susceptibility result using the codes on the event forms.

Data Field	Instructions for Data Collection
	For each box listing several drugs of the same class, at least one drug susceptibility must be recorded.
Custom Fields	Optional. Up to 50 fields may be customized for local or group use in any combination of the following formats: date (MM/DD/YYYY), numeric, or alphanumeric. **NOTE:** Each custom field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter any information on the event.