TENNESSEE DEPARTMENT OF HEALTH
HEALTHCARE-ASSOCIATED INFECTIONS AND ANTIMICROBIAL RESISTANCE PROGRAM
Surveillance Definitions

BLOOD STREAM INFECTION (BSI)

(Last updated January 1, 2011)

Primary bloodstream infections (BSI) are laboratory-confirmed bloodstream infections (LCBI) that are not secondary to an infection meeting CDC/NHSN criteria at another body site (see criteria on body site specific checklist). Report BSIs that are central-line associated (i.e., a central line or umbilical catheter was in place at time of, or within 48 hours before, onset of event).

> **NOTE:** There is no minimal period of time that the central line must be in place in order for the BSI to be considered central line-associated.

Primary vs. secondary attribution: Because a fever is a non-specific sign of infection, it is possible that an individual may run a fever due to more than one infection at a time. It would be impossible to determine which infection (if not both) was the cause of the fever. Therefore, if all other criteria besides fever are met, both infections would be reported if surveillance for both of these events were being performed.

Source: NHSN September 2011 Newsletter
URL: www.cdc.gov/nhsn/PDFs/Newsletters/newsletter-Sept-2011.pdf

> **NOTE:** Although CDC provided interpretive guidance related to primary vs. secondary attribution in the September NHSN Newsletter, TDH has asked that IPs apply this interpretive guidance starting January 2011 to ensure a full calendar year of comparable data.

Location of attribution: the location where the patient was assigned on the date of the BSI event, which is further defined as the date when the first clinical evidence appeared or the date the specimen used to meet the BSI criteria was collected, whichever came first.

EXAMPLE: Patient has a central line inserted in the Emergency Department and then is admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for BSI. This is reported to NHSN as CLABSI for the MICU, because the Emergency Department is not an inpatient location and no denominator data are collected there.

TRANSFER RULE EXEMPTION: If a CLABSI develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below:

- Patient with a central line in place in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for BSI. This is reported to NHSN as a CLABSI for the SICU.
- Patient is transferred to the medical ward from the MSICU after having the central line removed. Within 24 hours, patient meets criteria for BSI. This is reported to NHSN as a CLABSI for the MSICU.
- Patient with a central line in place is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for a BSI. This is reported to NHSN as a CLABSI for the CCU.
- Patent on the urology ward of Hospital A had the 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 with a BSI. This CLABSI should be reported to NHSN for, and by, Hospital A and attributed to the urology ward. No additional catheter days are reported.

BLOOD STREAM INFECTION (BSI)

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 femoral veins, and 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 these vessels or in or near the heart to qualify as a central line.
2. An introducer is considered an intravascular catheter, and depending on the location of its tip, may be a central line.
3. Pacemaker wires and other nonlumened devices inserted into central blood vessels or the heart are not considered central lines, because fluids are not infused, pushed or withdrawn through such devices.
4. The following devices are not considered central lines: extracorporeal membrane oxygenation (ECHMO), femoral arterial catheters and Intra-aortic balloon pump (IABP) devices.

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.

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

Temporary central line: A non-tunneled catheter

Permanent central line: Includes

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

LCBI – Laboratory-Confirmed Blood Stream Infection

DEFINITION: LCBI must meet at least **ONE** ☐ of the following criteria:

☐ **Criterion 1**: ***(Last updated January 1, 2010)***

- Patient of any age has a recognized pathogen cultured from one or more blood cultures

AND

- The organism cultured from blood is not related to an infection at another site (see notes 1 and 2 below)

Criterion 2: *(Last updated January 1, 2010)*

- Patient of any age has at least **ONE** Δ of the following signs or symptoms:
  - Δ fever (>38°C)
  - Δ chills
  - Δ hypotension

AND

- Patient has signs and symptoms and positive laboratory results are not related to an infection at another site

AND

- Patient has a common skin commensal is cultured from two or more blood cultures drawn on separate occasions.

EXAMPLES OF COMMON SKIN COMMENSAL:
diphtheroids [*Corynebacterium* spp. not C. diphtheriae], *Bacillus* spp [not *B. anthracis*], *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., *Micrococcus* spp.

Criterion 3: *(Last updated January 1, 2010)*

- Patient ≤1 year of age has at least **ONE** Δ of the following signs or symptoms:
  - Δ fever (>38°C core)
  - Δ hypothermia (<36°C core)
  - Δ apnea
  - Δ bradycardia

AND

- Patient has signs and symptoms and positive laboratory results are not related to an infection at another site

AND

- Patient has common skin commensal is cultured from two or more blood cultures drawn on separate occasions. (see Notes 3, 4 and 5 below).

EXAMPLES OF COMMON SKIN COMMENSAL:
diphtheroids [*Corynebacterium* spp. not C. diphtheriae], *Bacillus* spp [not *B. anthracis*], *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., *Micrococcus* spp.

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NOTES*: *(Last updated January 1, 2011)

1. In Criterion 1, the phrase "1 or more blood cultures" means that at least one bottle from a blood draw is reported by the laboratory as having grown organisms (i.e. is a positive blood culture).
2. In Criterion 1, the term "recognized pathogen" does not include organisms considered common contaminant (see Criteria 2 and 3 for a list of common contaminant). A few of the recognized pathogens are *S. aureus*, *Enterococcus* spp., *E. coli*, *Pseudomonas* spp., *Klebsiella* spp., *Candida* spp., and others.

3. In Criteria 2 and 3, the phrase "two or more blood cultures drawn on separate occasions" means (1) that blood from at least two blood draws were collected within two days of each other (e.g. blood draws on Monday and Tuesday or Monday and Wednesday would be acceptable for blood cultures drawn on separate occasions, but blood draws on Monday and Thursday would be too far apart in time to meet this criterion) and (2) that at least one bottle from each blood draw is reported by the laboratory as having grown the same common skin contaminant organism (i.e. is a positive blood culture). (See Note 4 for determining sameness of organisms.)
    a. For example, an adult patient has blood drawn at 8 AM and again at 8:15 AM of the same day. Blood from each blood draw is inoculated into two bottles and incubated (four bottles total). If 1 bottle from each blood draw set is positive for coagulase-negative staphylococci, this part of the criterion is met.

For example, a neonate has blood drawn for culture on Tuesday and again on Saturday, and both grow the same common contaminant. Because the time between these blood cultures exceeds the 2-day period for blood draws stipulated in Criteria 2 and 3, this part of the criteria is not met.

    b. A blood culture may consist of a single bottle for a pediatric blood draw because of volume constraints. Therefore, to meet this part of the criterion, each bottle from two or more draws would have to be culture positive for the same contaminant
4. If the common skin commensal is identified to the species level from one culture, and a companion culture is identified with only a descriptive name (e.g., to the genus level), then it is assumed that the organisms are the same. The speciated organism should be reported as the infecting pathogen (see examples).

Table 1. Examples of how to report speciated and unspeciated common skin contaminate organisms

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

5. Only genus and species identification should be utilized to determine the sameness of organisms. No additional comparative methods should be used (e.g., morphology or antibiograms) because laboratory testing capabilities and protocols may vary between facilities. This would 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.
6. LCBI criteria 1 and 2 may be used for patients of any age, including patients ≤1 year of age.

7. Specimen Collection Considerations:
   Ideally, blood specimens for culture should be obtained from 2 to 4 blood draws from separate venipuncture sites (e.g., right and left antecubital veins), not through a vascular catheter. Theses blood draws should be performed simultaneously or over a short period of time (i.e., within a few hours). If your facility does not currently obtain specimens using this technique, you may still report BSIs using the criteria and notes above, but you should work with appropriate personnel to facilitate better specimen collection practices for blood cultures.

REPORTING INSTRUCTIONS*: *Last updated January 1, 2011)

- Report organisms cultured from blood as BSI – LCBI when no other site of infection is evident.
- 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.
- Purulent phlebitis confirmed with a positive semi-quantitative culture of a catheter tip, but with either negative or no blood culture is considered a CVS-VASC, not a BSI or an SST-SKIN or ST infection.
- 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 (e.g., pus at the insertion site and matching pathogen from pus and blood). In this situation, enter “Central Line = No” in the NHSN application. You should, however, count the patient’s central line days in the summary denominator count.