Getting it Right!

NHSN Definitions

Slides authored by CDC NHSN staff with minor modifications by speaker

Objectives

- Identify where the definition of healthcare-associated infection and criteria for specific sites of infection can be found
- Apply site-specific infection criteria to case studies
- Count device- and patient-days correctly

Healthcare-associated Infection (HAI)

- A localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s)
  - There must be no evidence that the infection was present or incubating at the time of admission
  - Occurs in a patient in a healthcare setting and
- When the setting is a hospital, meets the criteria for a specific infection (body) site as defined by the CDC
- When the setting is a hospital, may also be called a nosocomial infection

Horan TC, Andrus ML, Dudeck MA. CDC/NHSN surveillance definition of healthcare-associated infection and criteria for specific types of infections in the acute care setting. *Am J Infect Control 2008;36:309-32*

HAI

- The following infections are not considered healthcare associated:
  - Infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection
  - Infections in infants that have been acquired transplacentally & become evident $\leq$ 48 hours after birth
  - Reactivation of a latent infection

Horan TC, Andrus ML, Dudeck MA. CDC/NHSN surveillance definition of healthcare-associated infection and criteria for specific types of infections in the acute care setting. *Am J Infect Control 2008;36:309-32*

HAI

- The following conditions are not infections:
  - Colonization–presence of microorganisms on skin, mucous membranes, in open wounds, or in excretions or secretions but are not causing adverse clinical signs or symptoms
  - Inflammation that results from tissue response to injury or stimulation by noninfectious agents, such as chemicals

Horan TC, Andrus ML, Dudeck MA. CDC/NHSN surveillance definition of healthcare-associated infection and criteria for specific types of infections in the acute care setting. *Am J Infect Control 2008;36:309-32*

Definition: Central Line

- **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:

Aorta
Pulmonary Artery
Superior Vena Cava
Inferior Vena Cava
Brachiocephalic Vein
Internal Jugular Vein
Subclavian Vein
External Iliac Vein
Common Femoral Vein

Types of Central Lines

- Temporary- A central line that is NOT tunneled.

- Permanent- A central line that is tunneled.

- In neonates, the umbilical artery is considered a great vessel
- 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
- 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

Definition: CLABSI

- A primary bloodstream infection (BSI) in a patient that had a central line *within* the 48 hour period before the development of the BSI
- If the BSI develops in a patient within 48 hours of discharge from a location, indicate the discharging location on the infection report
- There is no minimum time period that the central line must be in place in order for the BSI to be considered central-line associated.

Transfer Rule

- If the BSI develops in a patient within 48 hours of transfer from one inpatient location to another, indicate the transferring location on the infection report.
  - ***Example**: A patient with a central line is transferred from the Orthopedic unit to the ICU on Monday. On Tuesday afternoon, he spikes a fever and is determined to have a CLABSI. The location of the CLABSI is recorded as the Orthopedic unit.*
- It is not required to monitor for CLABSIs after the patient is discharged from the facility. However, if discovered, they should be reported to NHSN. No additional central line days are recorded.

CLABSI Numerator Data

- Use Primary Bloodstream Infection (BSI) form for each CLABSI that is identified during the month.
- Indicate the specific type of BSI
  - Laboratory-confirmed Bloodstream Infection (LCBI)- can be used for any patient, including patients $\leq$ 1 year of age.

  OR
  - Clinical Sepsis (CSEP)- is only used for
    - Neonates ($\leq$ 30 days old)
    - Infants ($\leq$ 12 months old)

LCBI Criterion 1

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

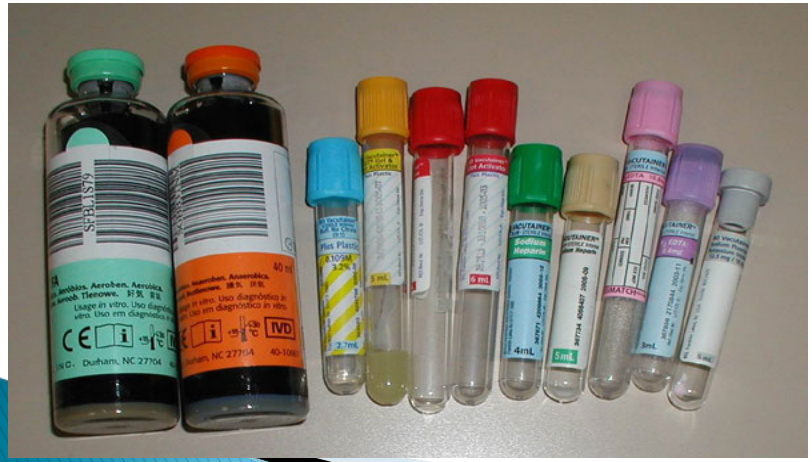
AND

- Organism cultured from blood is NOT related to an infection at another site

Example: Jon Smith had a PICC line inserted on admission (June 1). On hospital day 4, he became confused and experienced chills. Blood cultures were drawn which grew *E. faecalis.*

Mr. Smith meets criteria for LCBI Criterion 1.

One or more blood cultures means that at least one bottle from a blood draw is reported by the laboratory as having organisms (i.e., is a positive blood culture).



Recognized pathogen does not include organisms considered common skin contaminants. A few of the recognized pathogens are Staph aureus, Enterococcus spp., E coli, Pseudomonas spp., Klebisiella spp., etc.

LCBI Criterion 2

- Patient has at least **one** of the following signs or symptoms: fever (>38 C), chills, or hypotension

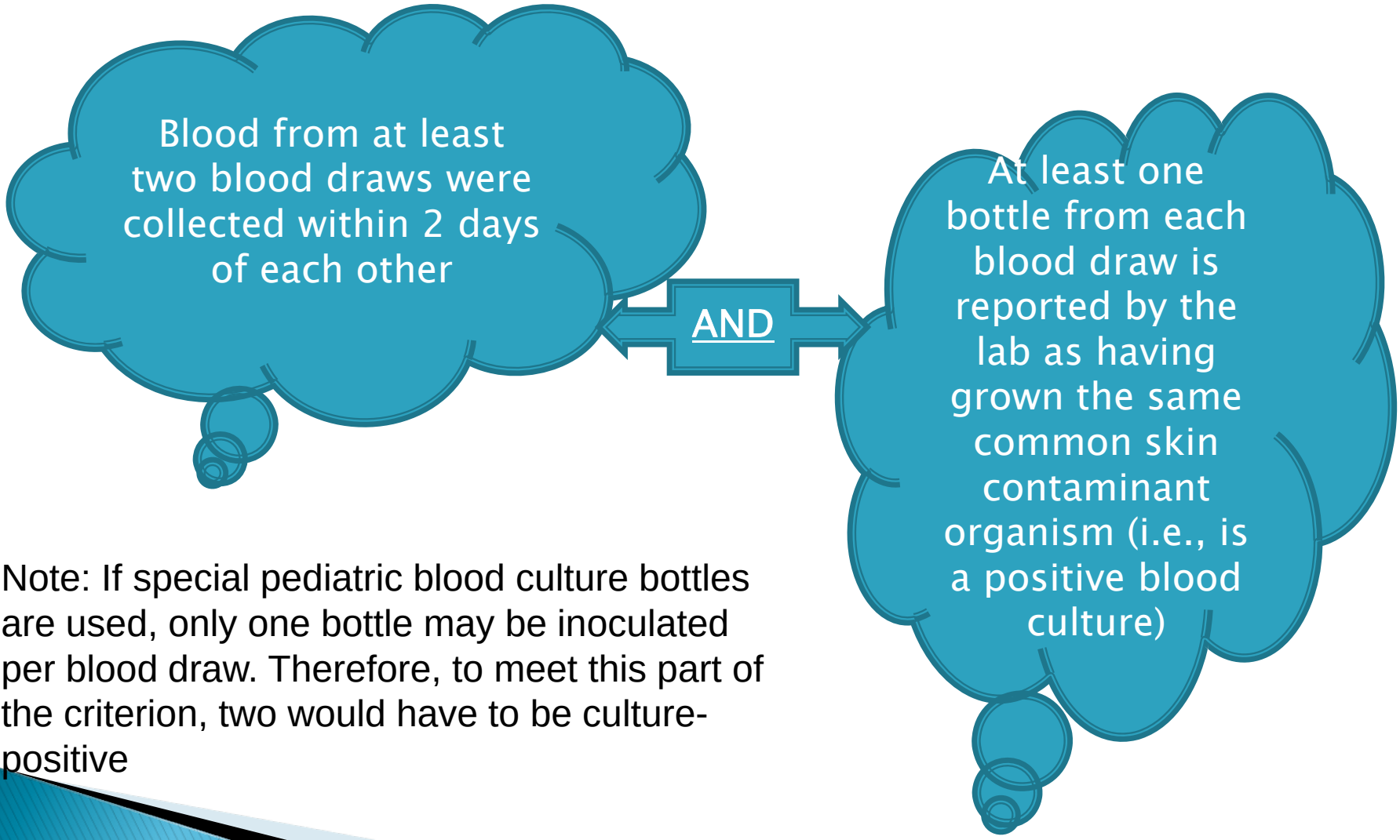
AND

- Signs and symptoms and positive lab results are **not** related to an infection at another site

AND

- Common skin contaminant is cultured from **two** or more blood cultures drawn on separate occasions.

The phrase "two or more blood cultures drawn on separate occasions" means:



Note: If special pediatric blood culture bottles are used, only one bottle may be inoculated per blood draw. Therefore, to meet this part of the criterion, two would have to be culture-positive

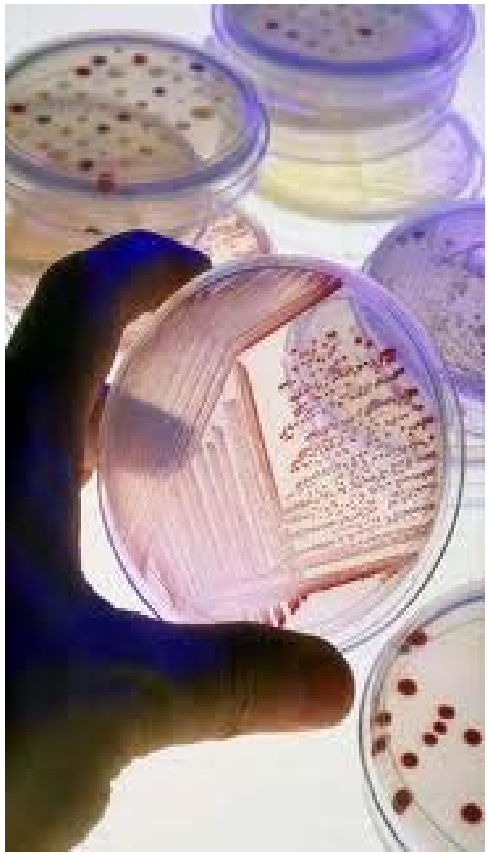
Determining the 'sameness' of two organisms

- If the common skin contaminant from one culture is identified to both genus and species level (e.g., *S. epidermis)* and the companion culture identifies only the genus with or without attributes (in this example, coagulase-negative staphylocci), then it is assumed that the organisms are the same.
- Report the genus/species to NHSN, i.e., in this example, report *S. epidermis.* See below:

Culture	Companion Culture	Report as…
Bacillus spp. (not anthracis)	*B. cereus*	*B. cereus*
S. salivarius	*Strep viridians*	*S. salivarius*

Determining the 'sameness' of two organisms

If common skin contaminant organisms are speciated (e.g., both are *B. cereus)*, but no antibiograms are done, or they are done for only one of the isolates, it is assumed that the organisms are the same.



Determining the 'sameness' of two organisms

If the common skin contaminants from the cultures have antibiograms that are different for the two or more antimicrobial agents, it is assumed that the organisms are not the same.

Example:

Organism Name	Isolate A	Isolate B	Interpret as …
S. Epidermis	All drugs **S**	All drugs **S**	Same
S. Epidermis	OX **R** GENT **R**	OX **S** GENT **S**	Different
Corynebacterium spp.	PENG **R** CIPRO **S**	PENG **S** CIPRO **R**	Different
Strep viridans	All drugs **S**	All drugs **S** except ERYTH **R**	Same

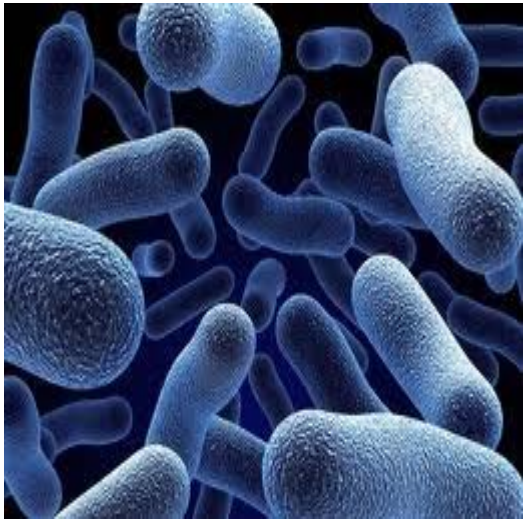
Collecting Blood Culture Specimens

Ideally, blood specimens for culture should be obtained from two to four blood draws from separate venipuncture sites (e.g., right and left antecubital veins), not through a vascular catheter.

These 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 NHSN criteria, but you should work with appropriate personnel to facilitate better specimen collection practices for blood cultures.

Case Studies



Case Study 1

- A 18 week old patient in your NICU with a birth weight of 560 grams and present weight of 2600 grams developes apnea, a fever >38 degrees and has a positive blood culture on Monday and Tuesday with Coag. Staph. Pos. organism, the patient had its PICC line discontinued at 0900 on Saturday and developed the above symptoms at 0730 on Monday.

- Would this be a CLABSI?
- Which weight would you use for documenting this infection?
- Would this infection be reported in the NHSN for both CUSP and the State of Nevada?

Case Study 2

- Patient with a MDRO Acinetobacter b infection in a wound on his lower leg, developes hypotension and blood culture shows the same organisms is growing in one blood culture. The patient had a PICC line inserted 5 hours ago.

Is this a BSI?

Is this a CLABSI?

Would this be reported in the NHSN for CUSP? For the State of Nevada?

Case Study 3

- Elderly female was admitted to your hospital with a fever >38, chills, she had a foley and PICC line in place on admission. Blood cultures and urine cultures are order with the following results:

  Blood culture grows MRSA

  Urine culture grows MSSA

Is this a BSI?

Is this a CLABSI?

Do you have 2 infections?

Would both of these results be reported in the NHSN for CUSP?

For State of Nevada?

Case Study 4

- A six week old patient develops apnea in your PICU, the patient has a central line with TPN running and a diagnosis of failure to thrive. The physician orders blood cultures x 2, the first culture was drawn on Monday at 0600 and the second was drawn on Wednesday at 0930 both cultures return as Staph Epi.

Is this a BSI?

Is this a CLABSI?

Do you have 2 infections?

Would both of these results be reported in the NHSN for CUSP?

For State of Nevada?

What would be the best next action?

Case Study 5

- A patient in your ICU has a Ventilator Associated Infection caused from MRSA, the patient develops chills and the physician orders blood cultures x3, two of the three blood cultures return growing MRSA and Kleb p.

Is this a BSI?

Is this a CLABSI?

Do you have 1 or 2 infections?

Would both of these results be reported in the NHSN for CUSP?

For State of Nevada?

Case Study 6

- A patient is admitted with a SSI following a total knee surgery. The surgical site grows Enterococcus faecalis that is ESBL+, the surgeon orders blood cultures x 2, one culture has “no growth”, the second culture is Corynebacterium spp.

Is this a BSI?

Is this a CLABSI?

Do you have 1 or 2 infections?

Would both of these results be reported in the NHSN for CUSP?

For State of Nevada?

Case Study 7

A patient has been in your ICU for 14 days, a central line was inserted on the 2nd day of admission, after 14 days the patient is transferred to a IMC and developes a fever 2 days (46 hours) after the transfer. Blood cultures are ordered and both grow MRSA, it is noted that the patient had a MRSA surveillance nasal smear done on admission that was negative for MRSA.

Is this a BSI?

Is this a CLABSI?

What unit gets credit for this infection?

Would both of these results be reported in the NHSN for CUSP?

For State of Nevada?

What could be done to prevent this infection?

Case Study 8

- A patient has been in your IMC for 6 days with both a peripheral I.V. and a central line. On the 6th day the patient becomes hypotensive and is moved to the ICU, two days later the patient developes a fever and hypotension again, blood cultures are ordered times 2 and both grow MDRO Pseudomonas a.

Is this a BSI?

Is this a CLABSI?

What unit gets credit for this infection?

Would these results be reported in the NHSN for CUSP?

For State of Nevada?

References

Allen-Bridson, K., *Epidemiology and laboratory capacity for infectious disease program.* HAI Grantee Meeting. October 2009

Centers for Disease Control and Prevention. *Central line associated bloodstream infection event module.* http://www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf

Horan, T., *Getting it right! Learning how to use the NHSN Surveillance definitions.* Division of Healthcare Quality Promotion. Centers for Disease Control and Prevention. July 2010.

O'Grady NP, Alexander M, Dellinger EP, Gerberding JL, Heard SO, Maki DG, et al. *Guidelines for the prevention of intravascular catheter related infections.* MMWR 2002:51 (No. RR-10:1-26).

http://www.cdc.gov/nhsn.html

For more information refer to the NHSN website *NHSN Manual: Patient Safety Component Protocol* located at *http://www.cdc.gov/ncidod/dhqp/nhsn_members.html*

- Tables of instruction for completing all forms
- Key terms
- Operative procedure codes
  - NHSN data collection forms