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Spot the BSI: Understanding the Bloodstream Infection (BSI) Event Definition

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Objectives

- At the end of this presentation, you will be able to:
 - Apply NHSN surveillance criteria to correctly identify Laboratory-Confirmed Bloodstream Infections (LCBI 1, 2, and 3).
 - Determine central line eligibility and accurately attribute BSI events as Central Line-Associated Bloodstream Infection (CLABSI) by understanding central line definitions, access requirements, eligibility timelines, and CLABSI exclusions.
 - Recognize and apply mucosal barrier injury laboratory-confirmed bloodstream infection (MBI-LCBI) criteria.

The Case Begins

- Every positive blood culture tells a story.....
 - Investigate the evidence
 - Apply the rules
 - Solve the case
- Time to put on your surveillance hat.....



Your mission: Spot the BSI



Why This Matters

- **The Impact:**

- ~18,100 CLABSIs occur annually in U.S. acute care facilities

- **The Consequences:**

- Prolonged hospital stays
- Increased costs
- Risk of mortality

- **The Good News:**

- CLABSIs are preventable through proper insertion techniques and line management





Your Detective's Glossary

Key Terms

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

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PATIENT SAFETY COMPONENT MANUAL

Chapter 4: Bloodstream Infection Event

Key Terms

- **Date of Event (DOE)**
 - The date when the first element occurs for the first time within the infection window period
- **Infection Window Period (IWP)**
 - 7-day period that includes the collection date of the first positive diagnostic test, the 3 calendar days before and the 3 calendar days after
- **Repeat Infection Timeframe (RIT)**
 - 14-day period during which a new infection of the same type is not reported (DOE = Day 1)



Refer to the NHSN Patient Safety Manual, Chapter 2
Identifying Healthcare Associated Infections in NHSN

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limited to only 1000 participants

The First Clue: What Type of BSI

Primary Bloodstream Infection (BSI)

- A laboratory confirmed BSI that is NOT secondary to an infection at another body site

Secondary BSI

- A BSI thought to be seeded from a site-specific infection at another body site



Confirm the BSI is NOT secondary before assigning LCBI.

Access: What Counts

Performance of ANY of the following during current inpatient admission:



Line Placement



Use of Central Line For **Infusion**



Withdrawal of Blood



Hemodynamic Monitoring

Essential Evidence: Defining Infusion

- Administration of any solution through the lumen of a catheter into a blood vessel

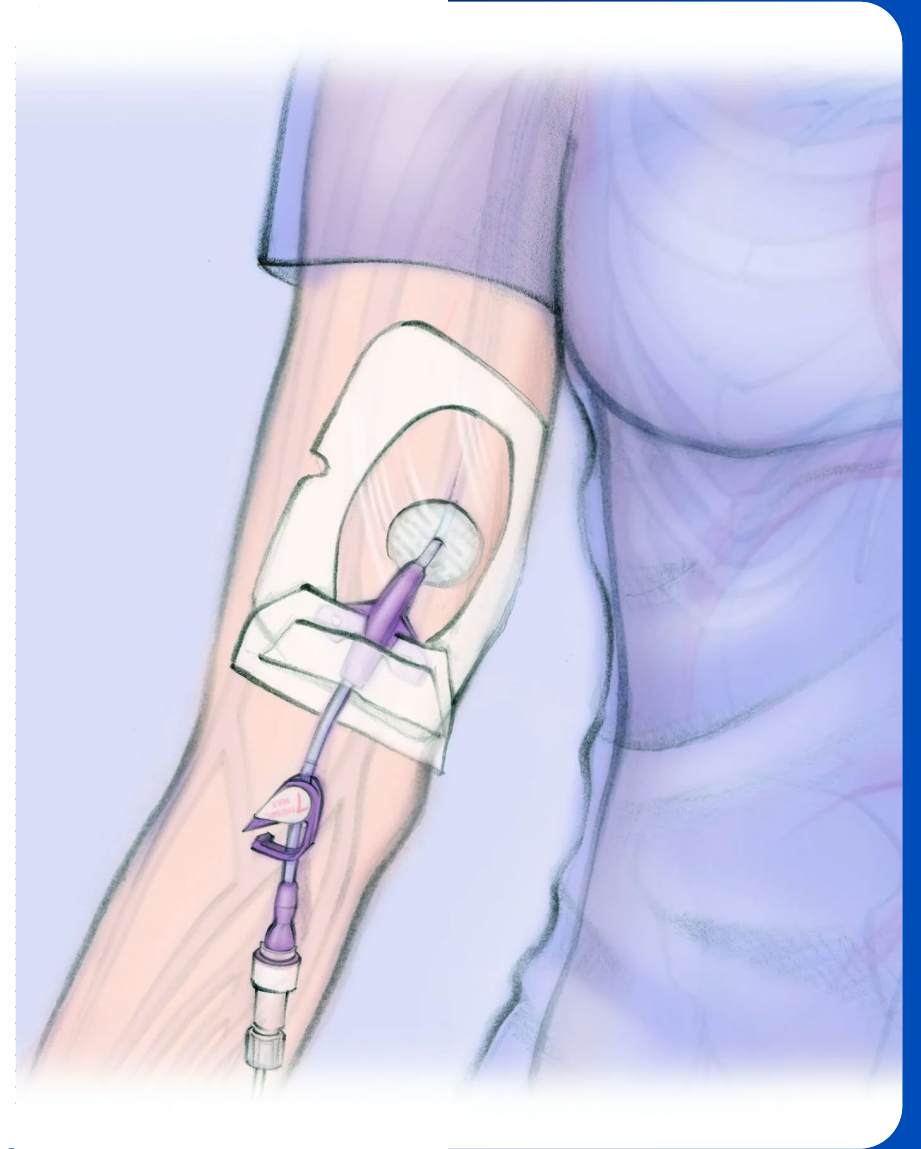
Continuous Infusion	IV Antimicrobials	Intermittent Infusion	Hemodialysis Treatment	Blood Transfusion
<ul style="list-style-type: none">• Nutritional fluids, medications	<ul style="list-style-type: none">• Antibiotics, antifungals, antivirals	<ul style="list-style-type: none">• IV flush, periodic medications	<ul style="list-style-type: none">• Dialysis procedures	<ul style="list-style-type: none">• Blood products, platelets, plasma

Access: Important Reminders

- **Admitted with CL in Place**
 - If only CL present → **CL Day 1 = first inpatient access**
- **What Counts as “Inpatient Access”?**
 - Any department serving inpatients (OR, IR, GI, Cath Lab, Dialysis, etc.)
- **Dialysis Patients**
 - Include in CLABSI surveillance in **assigned inpatient unit**
 - Even if dialysis staff are the only ones accessing the line
 - CLABSI is attributed to the **patient’s inpatient unit**

The Device in Question: What is a Central Line

- An intravascular catheter that:
 - Terminates at, in, or close to the heart OR in one of the great vessels
 - AND
 - Is used for infusion, withdrawal of blood, or hemodynamic monitoring
-
- Neither the **type of device** nor the **insertion site** determines if it's a central line for NHSN purposes

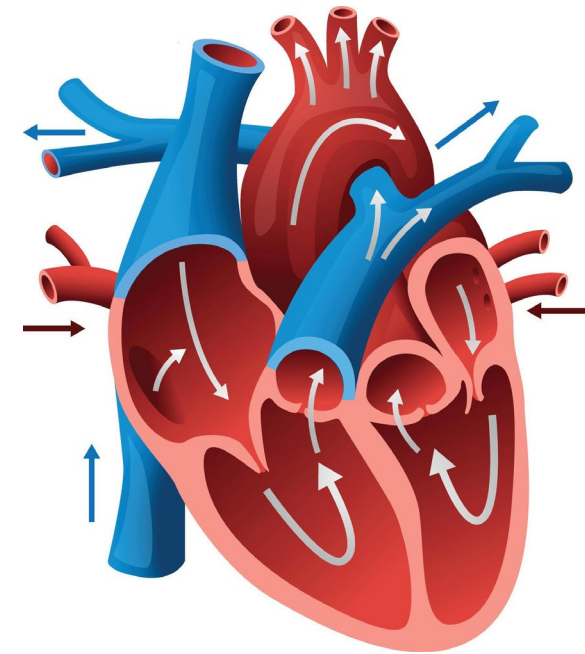


It's all about the location of the tip and its use.

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Great Vessels

- Aorta
- Superior vena cava
- Brachiocephalic veins
- Subclavian veins
- Common iliac veins
- In neonates: Umbilical artery/vein
- Pulmonary artery
- Inferior vena cava
- Internal jugular veins
- External iliac veins
- Femoral veins



Reference these great vessels when assessing CLABSI and CL days.

Types of Central Lines for NHSN

Permanent Central Line

- Tunneled catheters (including tunneled dialysis catheters)
- Implanted catheters (including ports)

Temporary Central Line

- A non-tunneled, non-implanted catheter

Umbilical Catheter

- Vascular catheter inserted through umbilical artery or vein in neonate
- ALL umbilical catheters are central lines

Devices NOT Central Lines ✖

- Arterial catheters*
- Arteriovenous graft
- HERO dialysis catheter
- Peripheral IV
- Total Artificial Heart (TAH)
- Arteriovenous fistula
- ECMO
- IABP devices
- Midlines**
- Ventricular Assist Device (VAD)

★ New for 2026



* Unless in pulmonary artery, aorta, or umbilical artery

** Unless the central line definition is met

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Central Line Special Considerations

- **Migration**

- If originally confirmed central → remains a CL
- No ongoing tip verification required
- Remains a CL until removed or patient discharged

- **Non-Lumened Catheters**

- Not a CL if **no lumen** and not used for infusion, blood draw, or monitoring
 - Example: non-lumened pacemaker wires

- **Lumened Pacemaker Wires**

- May qualify as a CL if used for infusion, blood draw, or monitoring

Link to the Scene: Eligible Central Line

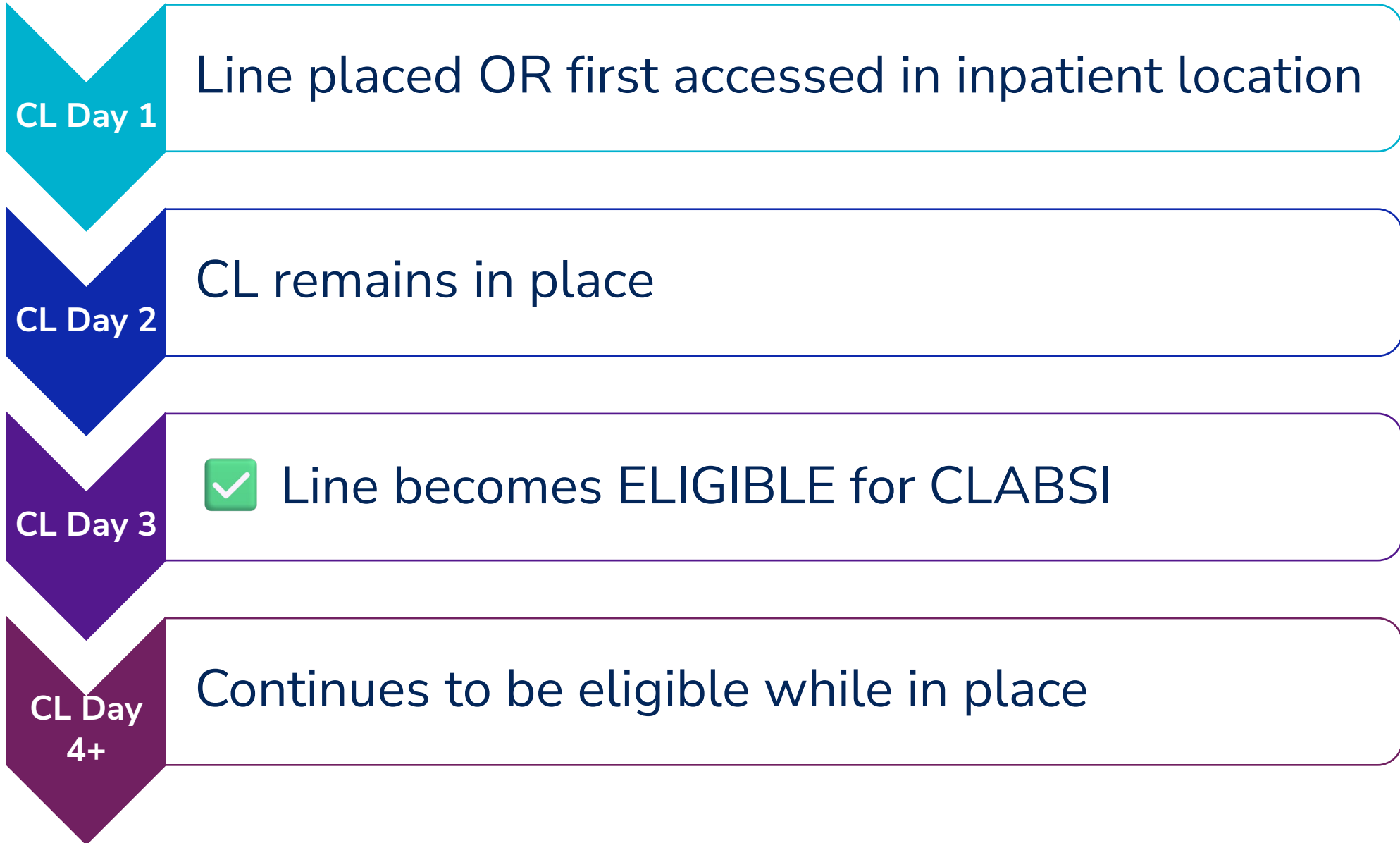
A central line (CL) in place for
MORE than 2 consecutive calendar days

Following **first access** in an **inpatient location**

During **current** admission

- Key Points:
 - Eligible for CLABSI events
 - Remain eligible until day after removal or patient discharge
 - De-accessing does NOT remove from surveillance

Tracking Central Line Eligibility



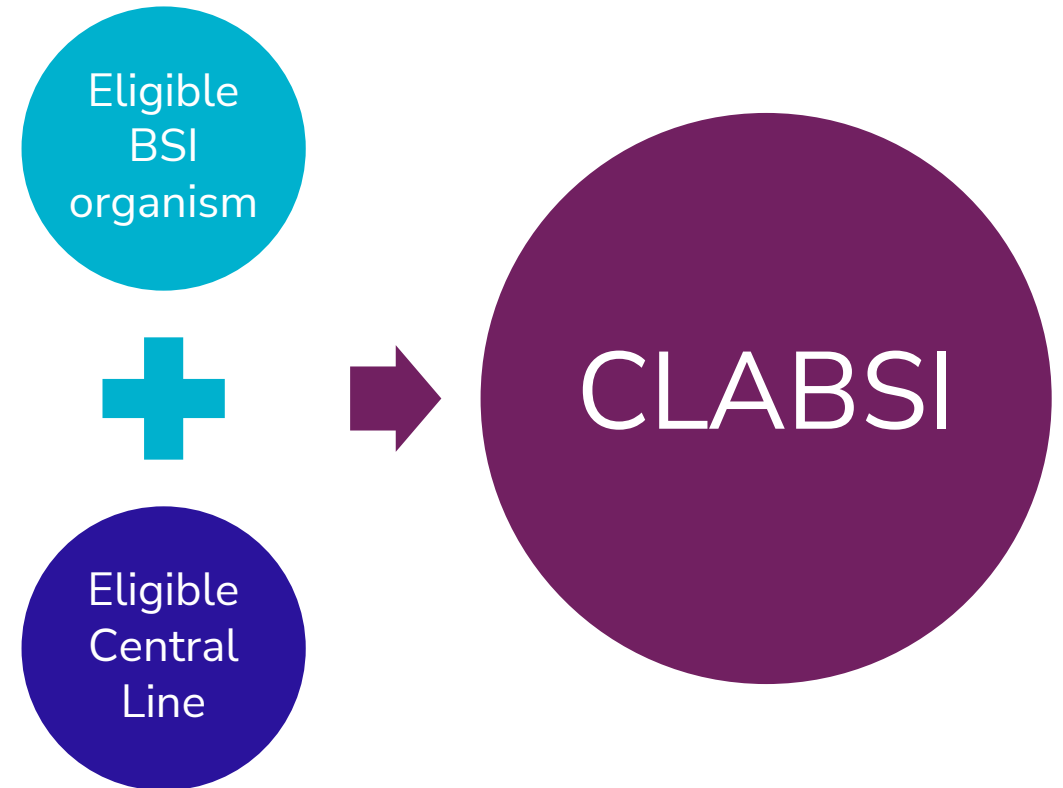
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Central line-associated BSI (CLABSI) Definition

- A laboratory confirmed bloodstream infection where:
 - An **eligible BSI organism** is identified

AND

- An **eligible central line** is present
 - on the LCBI DOE or the day before



Eligible BSI Organism:

Any organism eligible to meet LCBI or MBI-LCBI criteria

Knowledge Check #1

- Which statement is TRUE regarding central line eligibility for CLABSI?
 - A. A central line becomes eligible on the day it is inserted.
 - B. A central line becomes eligible after 2 calendar days in place.
 - C. A central line becomes eligible on or after CL Day 3 following first inpatient access.
 - D. De-accessing a line removes it from CLABSI surveillance.



Knowledge Check #1

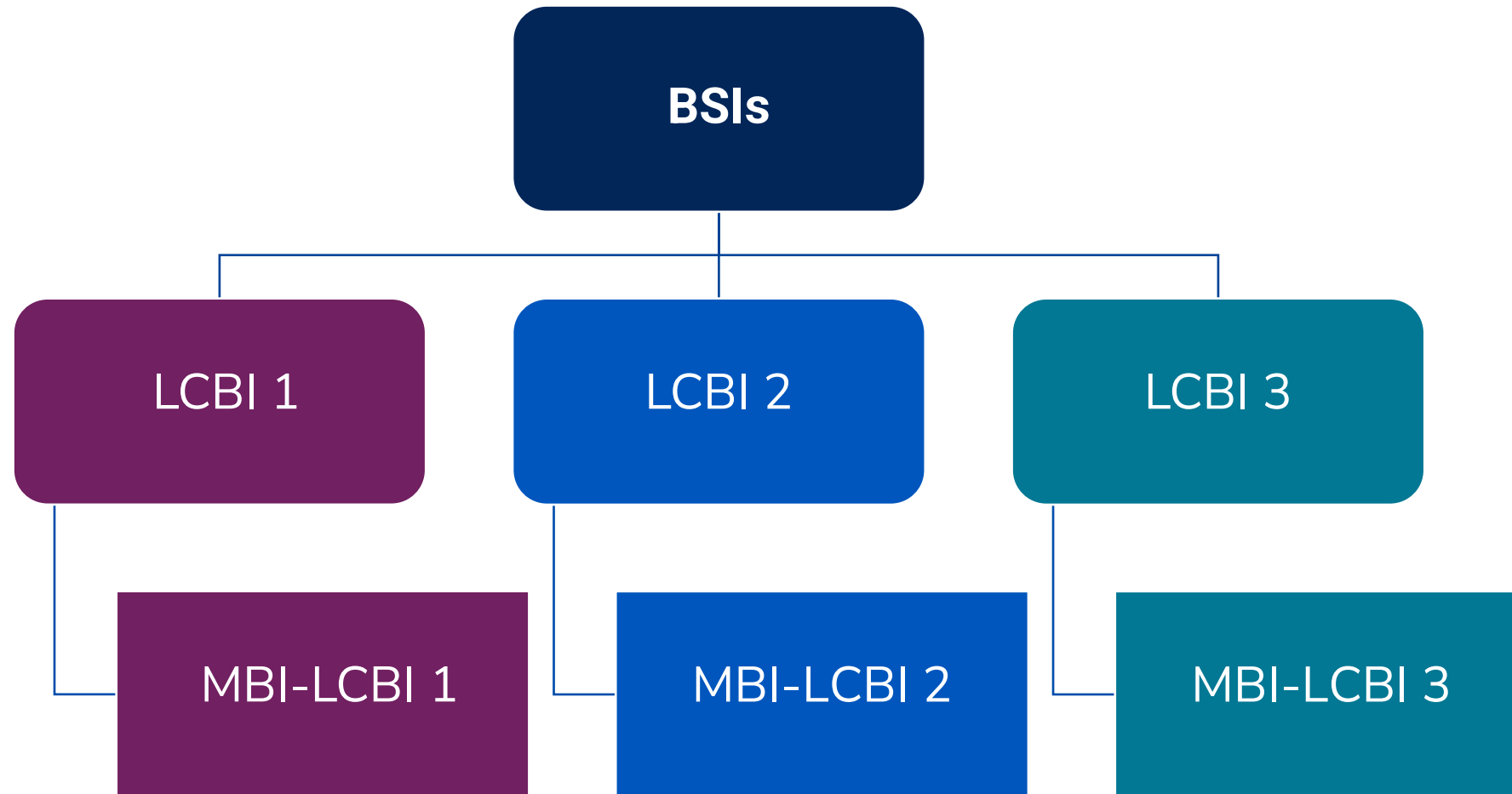
- Which statement is TRUE regarding central line eligibility for CLABSI?
 - A. A central line becomes eligible on the day it is inserted.
 - B. A central line becomes eligible after 2 calendar days in place.
 - C. A central line becomes eligible on or after CL Day 3 following first inpatient access.
 - D. De-accessing a line removes it from CLABSI surveillance.
- **Correct Answer: C**
 - CL Day 1 = day of first inpatient access
 - Line must be in place for >2 consecutive calendar days
 - Eligible on or after CL Day 3
 - De-accessing does NOT remove from surveillance





Laboratory-Confirmed Bloodstream Infection (LCBI) Criteria

Identify the Crime: Types of LCBIs



Important:

MBI-LCBI is a subset of LCBI. Must fully meet LCBI criteria FIRST, then evaluate for corresponding MBI-LCBI.

Clue #1: LCBI 1

- Patient of any age has a recognized bacterial or fungal pathogen (NOT on common commensal list):
 1. Identified from ≥ 1 blood specimen by culture

OR

 2. Identified to genus/species by non-culture based testing (NCT)*

AND

Organism(s) identified in blood is NOT related to infection at another site
- ***NCT Note:** If blood collected for culture within 2 days before OR 1 day after NCT, disregard NCT and use only culture. If no blood for culture in this period, use NCT for surveillance.



***NCT is methodology that identifies an organism directly from blood specimen without inoculation to culture media.**

LCBI 1: Case Notes to Remember

- Meeting **Both** LCBI 1 and LCBI 2/3
 - If patient meets both LCBI 1 AND LCBI 2 or 3, report LCBI 1 with:
 - Recognized pathogen as pathogen #1
 - Common commensal as pathogen #2
- **LCBI 1 DOE**
 - An eligible organism in blood is the **ONLY** element needed to meet LCBI 1
 - **LCBI 1 DOE** will **ALWAYS** be the collection date of the first positive blood specimen used to set the BSI IWP

Clue #2: LCBI 2

- Patient of any age has at least **ONE** of:

- Fever ($>38.0^{\circ}\text{C}$)
- Chills
- Hypotension

AND

- Organism(s) in blood NOT related to infection at another site

AND

- Same NHSN common commensal identified by culture from ≥ 2 blood specimens collected on separate occasions



Refer to NHSN Terminology Browser for common commensal organisms.

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Clue #3: LCBI 3

- Patient ≤ 1 year of age has at least **ONE** of:
 - Fever ($>38.0^{\circ}\text{C}$)
 - Hypothermia ($<36.0^{\circ}\text{C}$)
 - Apnea
 - Bradycardia

AND

- Organism(s) in blood NOT related to infection at another site

AND

- Same NHSN common commensal identified by culture from ≥ 2 blood specimens collected on separate occasions



Refer to NHSN Terminology Browser for common commensal organisms.

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LCBI 2 AND 3: Case Notes to Remember

- **7-Day IWP**
 - Criterion elements must occur within 7-day IWP
 - Collection date of positive blood + 3 days before + 3 days after
- **LCBI 2 DOE**
 - Date first element occurs for first time during BSI IWP (whether sign/symptom OR positive blood)
- **Example Timeline:**
 - 6/1: Fever $>38.0^{\circ}\text{C}$ → Date of 1st element → **LCBI 2 DOE = 6/1**
 - 6/4: S. epidermidis (1 of 2) → Date of 1st diagnostic test = 6/4
 - 6/5: S. epidermidis (2 of 2)



Collection date of FIRST specimen sets BSI IWP.

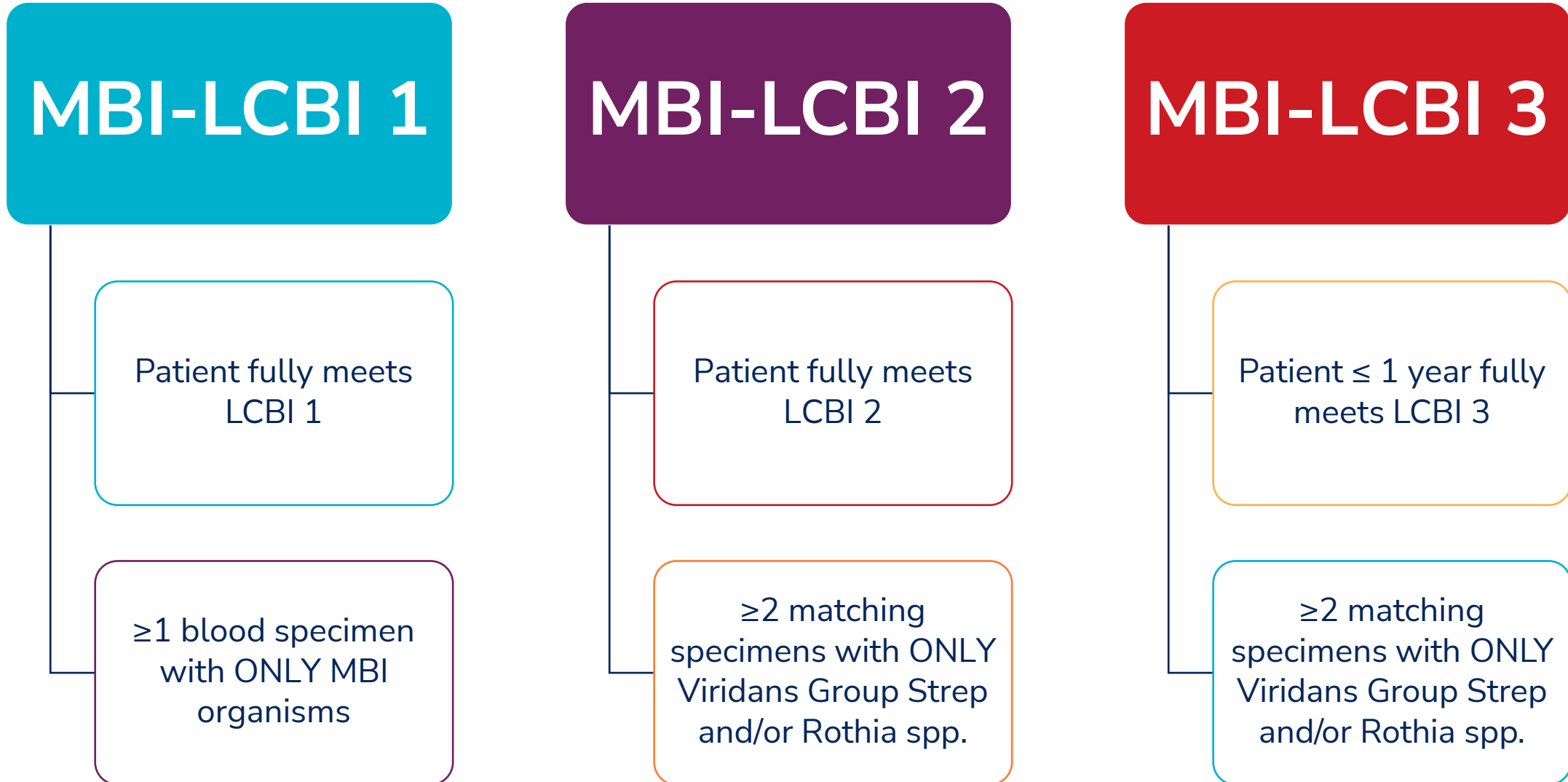
Specimen Investigation

- **"Two or more blood specimens drawn on separate occasions"**
 - ≥ 2 blood specimens
 - Collected on the same or consecutive calendar days
- **What Counts as Separate Draws?**
 - Separate specimen (accession) numbers
 - Processed independently
 - Reported separately in final lab report
- **Key Surveillance Rule**
 - ALL positive blood cultures must be included
 - Draw site (central vs peripheral) does NOT exclude a specimen



Catheter tip cultures are NOT eligible for LCBI criteria.

Solve Special Cases: Mucosal Barrier Injury (MBI)



MBI-LCBI

Patient Must Meet ONE of:

1. Allogeneic Hematopoietic Stem Cell Transplant

- Recipient within past year with ONE of following during same hospitalization:
 - a. Grade III or IV GI graft versus host disease (GI GVHD)**OR**
 - b. ≥ 1 -liter diarrhea in 24 hours (≥ 20 mL/kg/24hr for age < 18) with onset on or within 7 days before positive blood collected

2. Neutropenic

- At least TWO separate days with ANC and/or WBC < 500 cells/mm³
- Within 7-day period: positive blood date + 3 days before + 3 days after



Non-MBI organism during MBI-LCBI RIT → change event to LCBI and add organism.

MBI-LCBI: Case Notes to Remember

- **MBI-LCBI DOE**
 - ALWAYS the date prerequisite LCBI criteria are met
- **"No Other Organisms" Means**
 - No identification of:
 - Non-MBI-LCBI pathogen (e.g., *S. aureus*), OR
 - 2 matching common commensals from blood on separate occasions that would meet LCBI criteria
 - If this occurs, infection does NOT meet MBI-LCBI criteria



**Refer to NHSN Terminology
Browser for eligible MBI
organisms**

MBI-RIT Exception

- **When Non-MBI Organism Found During MBI-LCBI RIT:**
 - Generally, MBI-LCBI is edited to LCBI and non-MBI organism is added
- **EXCEPTION - MBI-LCBI Will NOT Change to LCBI If:**
 - Both conditions are met:
 1. Blood culture with non-MBI organism collected during existing BSI (MBI-LCBI) RIT

AND

 2. Blood culture with non-MBI organism deemed **SECONDARY** to an NHSN site-specific infection



See Example 5 in Secondary BSI Guide section text boxes

CLABSI Exclusions – Part 1

ECMO

Extracorporeal life support present >2 days on BSI DOE and in place on DOE or day before

VAD

Ventricular assist device present >2 days on BSI DOE and in place on DOE or day before

TAH

Total artificial heart present >2 days on BSI DOE and in place on DOE or day before

★ **New for 2026**

**Patient
Injection**

Documented observed/suspected patient INJECTION into vascular access within BSI IWP (NOT tampering/manipulation)



Event reported to NHSN, Central Line field marked "Yes" but excluded from CLABSI SIR calculation

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CLABSI Exclusions – Part 2

**Epidermolysis
Bullosa (EB)**

Documentation of EB diagnosis during current admission

Note: Limited to genetic forms of EB in pediatric population

**Pus at Vascular
Access Site**

Pus at site of non-CL vascular access device (arterial cath, AV fistula/graft, HERO, IABP, non-accessed CL, peripheral IV, midline)

AND specimen from that site has ≥ 1 matching organism to blood organism identified during BSI IWP

**Munchausen
Syndrome by
Proxy (MSBP)**

Documentation or diagnosis of known/suspected MSBP, also known as factitious disorder imposed on another (FDIA)



For all exclusions, meeting LCBI criteria sets a BSI RIT and device days included in denominator summary

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Knowledge Check #2

- Which statement must be TRUE before an event can be classified as MBI-LCBI?
 - A. The patient is neutropenic.
 - B. The patient has a central line.
 - C. The event fully meets LCBI criteria first.
 - D. The organism is a common commensal.



Knowledge Check #2

• Which statement must be TRUE before an event can be classified as MBI-LCBI?

A. The patient is neutropenic.

B. The patient has a central line.

C. The event fully meets LCBI criteria first.

D. The organism is a common commensal.

• **Correct Answer: C**

- MBI-LCBI is a **subset of LCBI**
- The event must **fully meet LCBI criteria FIRST**
- Then assess:
 - Eligible MBI organism
 - Neutropenia or qualifying transplant criteria
 - No non-MBI organisms present





BSI Investigator Briefing

Key Reporting Instructions

Key Reporting Instructions

- Group B *Streptococcus* (GBS) in Neonates
 - GBS with DOE ≤ 6 days of life → **Not a CLABSI**
 - BSI RIT set; device days still counted
- Single Common Commensal
 - One positive = contaminant
 - Cannot meet LCBI 2/3 or secondary BSI
 - Does not block MBI-LCBI if criteria require “only” organism
- Recognized Pathogen = Any organism **NOT** an NHSN common commensal



Refer to NHSN Terminology Browser for common commensal organisms.

Not LCBI Suspects ❌

EXCLUDED as

LCBI Pathogens

Eligible for secondary BSI but NOT as sole pathogen in primary BSI

- Parasites and viruses
- Enteric organisms: *Salmonella*, *Shigella*, *Yersinia*, *Campylobacter*, *Listeria*, *Vibrio*
- Pathogenic *E. coli*: STEC, ETEC, EPEC, EIEC, EAEC, DAEC
- *C. difficile*, *Giardia*

EXCLUDED Community-Associated Organisms

Cannot be used to meet ANY NHSN definition

- Fungi: *Blastomyces*, *Histoplasma*, *Coccidioides*, *Paracoccidioides*, *Cryptococcus*, *Pneumocystis*
- Vector-borne bacteria: *Anaplasma spp.*, *Ehrlichia spp.*, *Borrelia spp.*, *Rickettsia spp.*

Organism Reporting Rules

- Recognized Pathogen + Common Commensal
 - If criteria meet **LCBI 1 and LCBI 2/3** → **Report LCBI 1**
 - Recognized pathogen = **Pathogen #1**
 - Common commensal = **Pathogen #2**
 - Common commensal **cannot** be entered as Pathogen #1
- Determining “Sameness”
 - Use **genus and species only**
 - Complementary organisms count as the same
 - *Example: S. epidermidis + Coagulase-negative staph*
 - Do NOT use: colony morphology, biotype, antibiogram
- Reporting Level Rules
 - Report to **species level** when available
 - If no species → report genus
 - If no genus → report as listed (*e.g., Gram-positive bacillus*)
 - If susceptibilities differ → report **more resistant panel**

Central Line Days vs Denominator Device Days

Central Line Days

- Number of days a CL is accessed to determine if LCBI is a CLABSI
- CLABSI eligibility starts on Day 3 (after access)
- *Used for: Determining CLABSI association*

Denominator Device Days

- Count of CLs on an inpatient unit recorded in monthly denominator summary data
- **Count begins:** First day CL is present, regardless of access
- *Used for: Monthly reporting and rate calculations*

Denominator Data

What's Counted

- Device days & Patient days
- Same time, daily
- Per surveillance location

Collection Methods

- Manual: Daily counts, monthly totals
- Manual: Weekly sampling for ICUs/wards (not SCA/ONC/NICU)
- Electronic

Counting Rules

- One CL per patient/day
- Include all CLs regardless of access
- SCA/ONC: If both temporary and permanent, report only temporary
- NICU stratification by birthweight

Electronic Data Collection

- **Electronic counts MAY be used after validation**
 - For ANY location, after proving within 5% (+/-) of manual counts for minimum 3 consecutive months
- **Validation Process:**
 1. Conduct manual once-daily counts
 2. Compare to electronic counts from same period
 3. Calculate variance for each month
 4. Must be $\leq 5\%$ variance for 3 consecutive months
 5. Validate separately for EACH surveillance location
- **When Converting Between Electronic Systems:**
 - New electronic system MUST be validated against MANUAL counts
 - Do NOT validate new system against old electronic system
 - Validating electronic vs electronic can magnify errors
 - If new system not within 5%, resume manual counting

Your Investigation Checklist



Go back to the definition



Check timing windows (IWP, RIT)



Confirm organism criteria



Verify CL eligibility (Day 3+, accessed)



Check for exclusions





Case Files

Put Your Skills to the Test

Spot the BSI: Case #1

- **Patient:** 65-year-old admitted for pneumonia
- **Hospital Day 1:** PICC line placed
- **Hospital Day 3:** Blood culture collected → positive for *Staphylococcus epidermidis*
- **Hospital Day 3:** Second blood culture from different site → negative
- **Clinical note:** "Likely contaminant, patient clinically stable"



Is this a BSI event?

Case #1: Answer & Why

- **NOT a BSI Event** ✖
 - *S. epidermidis* is a common commensal organism
 - A single common commensal = contaminate
 - LCBI 2 requires ≥ 2 positive blood cultures on **separate occasions**
 - Only 1 positive culture positive
 - Cannot meet LCBI 1 (not a recognized pathogen)
- **Important Note:** Clinical impression doesn't override surveillance criteria

65-year-old admitted for pneumonia
HD 1: PICC placed
HD 3: Blood culture → *Staphylococcus epidermidis*
HD 3: Second culture (different site) → negative
Clinical note: "Likely contaminant," patient stable

Spot the BSI: Case #2

- **Patient:** 45-year-old with tunneled dialysis catheter (placed 2 weeks ago)
- **Hospital Day 1:** Admitted for cellulitis, catheter in place and accessed
- **Hospital Day 2:** Fever 38.5°C, chills
- **Hospital Day 3:** Blood culture #1 → *Staphylococcus epidermidis*
- **Hospital Day 3:** Blood culture #2 (separate draw) → *Staphylococcus epidermidis*
- **No other infections identified**

 **Is this a BSI event? If yes, is it a CLABSI?**

Case #2: Answer & Why

- **YES - BSI Event** ✓

- ✓ LCBI 2: Fever + 2 blood cultures with same common commensal on separate occasions

- ✓ Elements within 7-day IWP

- ✓ DOE = HD 2 (first element = fever)

- ✓ Not related to another site

- **NOT a CLABSI** ✗

- Tunneled dialysis catheter in place and accessed

- Day of first ACCESS in inpatient location = HD 1

- CL Day 1 = HD 1, CL Day 2 = HD 2, CL Day 3 = HD 3 (ELIGIBLE)

- ✗ DOE = HD 2 (fever) - line NOT eligible yet

- **Conclusion:**

- LCBI 2 but NOT CLABSI - line not eligible on DOE or day before

45-year-old with tunneled dialysis catheter (placed 2 weeks prior)

HD 1: Admitted for cellulitis; catheter in place & accessed

HD 2: Fever (38.5°C), chills

HD 3: Blood culture #1 → *S. epi*

HD 3: Blood culture #2 → *S. epi*

Spot the BSI: Case #3

- **Patient:** 7-day-old infant in NICU
- **Hospital Day 5:** Umbilical catheter in place (inserted day 1)
- **Hospital Day 5:** Apnea episodes documented
- **Hospital Day 6:** Blood culture #1 → *Staphylococcus epidermidis*
- **Hospital Day 7:** Blood culture #2 → *Staphylococcus epidermidis*
- **No other infections identified**

 **Is this a BSI event? If yes, is it a CLABSI?**

Case #3: Answer & Why

- **YES - LCBI 3** ✓

- ✓ Patient ≤ 1 year of age
- ✓ Apnea (qualifying sign/symptom for infants)
- ✓ Same common commensal (*S. epi*)
from 2 blood cultures on separate occasions
- ✓ Elements within 7-day IWP
- ✓ DOE = HD 5 (first element = apnea)

- **YES - CLABSI** ✓

- ✓ Umbilical catheter = central line (all umbilical caths are CLs)
- ✓ CL Day 1 = HD 1, Day 2 = HD 2, Day 3 = HD 3 (eligible HD 3+)
- ✓ DOE = HD 5, eligible CL present on DOE

- **Conclusion:** LCBI 3 CLABSI

7-day-old infant in NICU
HD 5: Umbilical catheter in place
(inserted Day 1)
HD 5: Apnea episodes documented
HD 6: Blood culture #1 → *S. epi*
HD 7: Blood culture #2 → *S. epi*

Spot the BSI: Case #4

- **Patient:** 28-year-old with port-a-cath (placed 6 months ago for chemo)
- **Hospital Day 1:** Admitted with neutropenia
- **Hospital Day 1:** Port accessed for antibiotics
- **Hospital Day 2:** WBC = 300 cells/mm³
- **Hospital Day 3:** Blood culture → *Escherichia coli*
- **Hospital Day 4:** WBC = 400 cells/mm³
- **No other infections identified**

 **Is this a BSI event?**
If yes, what type and is it a CLABSI?

Case #4: Answer & Why

- **YES - LCBI 1** ✓
 - ✓ *E. coli* is recognized pathogen
 - ✓ DOE = HD 3 (only element is positive blood)

- **YES - MBI-LCBI 1** ✓
 - ✓ Meets LCBI 1 with *E. coli* (MBI organism)
 - ✓ Neutropenic: WBC <500 on 2 separate days (HD 2=300, HD 4=400)
 - ✓ Elements within 7-day IWP

- **YES - CLABSI** ✓
 - Port accessed HD 1 = CL Day 1
 - HD 2 = CL Day 2, HD 3 = CL Day 3 (eligible)
 - ✓ DOE = HD 3 (eligible CL present on DOE)
 - ✗ MBI-LCBI events excluded from CLABSI SIR

- **Reported as:** MBI-LCBI 1 (not counted as CLABSI for SIR)

28-year-old with port-a-cath (placed 6 months prior for chemotherapy)
HD 1: Admitted with neutropenia; port accessed
HD 2: WBC 300 cells/mm³
HD 3: Blood culture → *E. coli*
HD 4: WBC 400 cells/mm³

Spot the BSI: Case #5

- **Patient:** 52-year-old admitted with septic shock
- **Hospital Day 1:** Triple lumen catheter placed in subclavian vein
- **Hospital Day 2:** Fever 38.8°C
- **Hospital Day 3:** Blood culture → *Staphylococcus aureus*
- **Hospital Day 4:** Line removed
- **No other infections identified**



Is this a BSI event? If yes, is it a CLABSI?

Case #5: Answer & Why

- **YES - LCBI 1** ✓
 - ✓ *S. aureus* is a recognized pathogen
 - ✓ Not related to another site
 - ✓ DOE = HD 3 (only element is positive blood)

- **YES - CLABSI** ✓
 - ✓ Triple lumen in subclavian vein = Central Line
 - ✓ CL Day 1 = HD 1 (placed = access)
 - ✓ CL Day 2 = HD 2
 - ✓ CL Day 3 = HD 3 (ELIGIBLE)
 - ✓ DOE = HD 3
 - ✓ Need eligible CL on DOE **OR** day before
 - ✓ Eligible CL present on DOE (HD 3)

- **Conclusion:** LCBI 1 CLABSI

52-year-old admitted with septic shock
HD 1: Triple lumen catheter placed (subclavian)
HD 2: Fever (38.8°C)
HD 3: Blood culture → *S. aureus*
HD 4: Line removed

Spot the BSI: Case #6

- **Patient:** 8-month-old infant in NICU
- **Hospital Day 4:** PICC line in place (inserted HD 1)
- **Hospital Day 4:** Hypothermia 35.5°C
- **Hospital Day 5:** Blood culture #1 → *Coagulase-negative Staphylococcus*
- **Hospital Day 5:** Blood culture #2 (separate draw) → *Staphylococcus epidermidis*
- **No other infections identified**

 **Do the organism match?**
Is this a BSI event? If yes, is it a CLABSI?

Case #6: Answer & Why

- Do Organisms Match?

- ✓ YES - *S. epidermidis* is a coagulase-negative *Staphylococcus*
- ✓ Organisms complementary
- ✓ Report as: *S. epidermidis*

- YES - LCBI 3 ✓

- ✓ Patient ≤ 1 year of age
- ✓ Hypothermia $< 36.0^{\circ}\text{C}$
- ✓ Same common commensal from 2 blood specimens on separate occasions
- ✓ Elements within 7-day IWP
- ✓ DOE = HD 4 (first element = hypothermia)

- YES - CLABSI ✓

- ✓ PICC in place since HD 1 (eligible HD 3+)
- ✓ DOE = HD 4, eligible CL present on DOE

- Conclusion: LCBI 3 CLABSI

8-month-old infant in NICU
HD 4: PICC in place (inserted HD 1)
HD 4: Hypothermia (35.5°C)
HD 5: Blood culture #1 → Coagulase-negative *Staphylococcus*
HD 5: Blood culture #2 → *S. epi*

Spot the BSI: Case #7

- **Patient:** 70-year-old oncology patient
- **Hospital Day 1:** Admitted with port in place (placed 3 months ago)
- **Hospital Day 1:** Port accessed for chemotherapy
- **Hospital Day 3:** Chills, fever 38.9°C
- **Hospital Day 4:** Blood culture #1 → *Enterococcus faecalis*
- **Hospital Day 4:** Blood culture #2 → *Candida albicans*
- **Hospital Day 1 labs:** WBC = 450 cells/mm³
- **Hospital Day 5 labs:** WBC = 300 cells/mm³
- **Patient is neutropenic oncology patient**

 **Is this a BSI event?**
If yes, what type and is it a CLABSI?

Case #7: Answer & Why

- **YES - LCBI 1** ✓
 - ✓ *E. faecalis* and *C. albicans* both recognized pathogens
 - ✓ Identified from blood by culture
 - ✓ DOE = HD 4 (only element is positive blood)
- **YES - MBI-LCBI 1** ✓
 - ✓ Meets LCBI 1
 - ✓ *E. faecalis* and *C. albicans* both on MBI organism list
 - ✓ Neutropenic: WBC <500 on 2 separate days (HD 1=450, HD 5=300)
 - ✓ Elements within 7-day IWP
- **NOT Counted as CLABSI** ✗
 - Port accessed HD 1 (eligible HD 3+). DOE = HD 4, eligible CL present.
 - BUT: MBI-LCBI events are EXCLUDED from CLABSI SIR measure.
- **Report as:** MBI-LCBI 1 with pathogens *E. faecalis* and *C. albicans*





70-year-old oncology patient
HD 1: Admitted with port in place (placed 3 months prior); accessed for chemotherapy
HD 3: Chills, fever (38.9°C)
HD 4: Blood culture #1 → *E. faecalis*
HD 4: Blood culture #2 → *C. albicans*
HD 1 WBC: 450 cells/mm³
HD 5 WBC: 300 cells/mm³




Spot the BSI: Case #8


- **Patient:** 35-year-old in ICU with ARDS on ECMO
- **Hospital Day 1:** ECMO initiated, femoral CL placed
- **Hospital Day 5:** Fever 39.1°C, hypotension
- **Hospital Day 5:** Blood culture → *Pseudomonas aeruginosa*
- **ECMO still in place on HD 5**
- **No other infections identified**

 **Is this a BSI event? If yes, is it a CLABSI?**

Case #8: Answer & Why

- **YES - LCBI 1** 
 -  *P. aeruginosa* is recognized pathogen
 -  DOE = HD 5 (only element is positive blood)
 -  Not related to another site

- **NOT Counted as CLABSI (ECMO Exclusion)** 
 -  Femoral CL placed HD 1, eligible HD 3+
 -  DOE = HD 5, eligible CL present

- **ECMO Exclusion Applies:**
 - ECMO present >2 days on BSI DOE (HD 1-5 = 4 days)
 - ECMO in place on DOE (HD 5) 
 - **Result:** Report to NHSN, mark ECMO "Yes"
 - **NOT** counted in CLABSI SIR measure

- **Report as:** LCBI 1 with ECMO exclusion

35-year-old in ICU with ARDS on ECMO
HD 1: ECMO initiated; femoral CL placed
HD 5: Fever (39.1°C), hypotension
HD 5: Blood culture → *P. aeruginosa*
ECMO and CL still in place

Spot the BSI: Case #9

- **Patient:** 42-year-old admitted to medical ward
- **Hospital Day 2:** Subclavian CL placed
- **Hospital Day 3:** CL removed, new CL placed same day
- **Hospital Day 5:** Fever 38.6°C
- **Hospital Day 6:** Blood culture → *Klebsiella pneumoniae*
- **No other infections identified**

 **Is this a BSI event? If yes, is it a CLABSI?**

Case #9: Answer & Why

- **YES - LCBI 1** ✓

- ✓ *K. pneumoniae* is recognized pathogen
- ✓ DOE = HD 6 (only element is positive blood)

- **YES - CLABSI** ✓

- **First CL:** HD 2 = CL Day 1, HD 3 = CL Day 2 (then removed)
- **Second CL:** Placed same day (HD 3)
- **Key Question:** Do CL days restart or continue?
 - ✓ NO FULL CALENDAR DAY passed without CL in place
 - ✓ CL days continue UNINTERRUPTED
 - ✓ HD 3 = CL Day 3 (second line becomes eligible immediately)
 - ✓ HD 4 = CL Day 4, HD 5 = CL Day 5, HD 6 = CL Day 6
 - ✓ DOE = HD 6, eligible CL present
 - Same-day replacement = no gap in CL presence = days continue

- **Conclusion:** LCBI 1 CLABSI

42-year-old admitted to medical ward
HD 2: Subclavian CL placed
HD 3: CL removed → new CL placed
HD 5: Fever (38.6°C)
HD 6: Blood culture: *K. pneumoniae*

Spot the BSI: Case #10

- **Patient:** 28-year-old with tunneled dialysis catheter
- **Hospital Day 1:** Admitted to ICU, catheter in place (not accessed)
- **Hospital Day 2:** Catheter NOT accessed
- **Hospital Day 3:** Catheter accessed for first time
- **Hospital Day 7:** Blood culture → *Staphylococcus aureus*
- **No other infections identified**

 **Is this a BSI event? If yes, is it a CLABSI?**

Case #10: Answer & Why

- YES - LCBI 1
 - S. aureus* is recognized pathogen
 - DOE = HD 7 (only element is positive blood)

28-year-old with tunneled dialysis catheter
HD 1: Admitted to ICU; catheter in place (not accessed)
HD 2: Catheter not accessed
HD 3: First catheter access
HD 7: Blood culture → *S. aureus*

- YES - CLABSI
 - CL admitted with patient but NOT accessed HD 1-2
 - **First ACCESS** in inpatient location = HD 3
 - CL Day 1 = HD 3 (first access)
 - CL Day 2 = HD 4
 - CL Day 3 = HD 5 (eligible)
 - DOE = HD 7, eligible CL present since HD 5
 - For CLABSI eligibility, day of **first ACCESS** in inpatient location begins CL day count, not day line placed (if placed before admission)
- **Conclusion:** LCBI 1 CLABSI

Spot the BSI: Case #11

- **Patient:** 58-year-old with PICC line, oncology unit
- **Hospital Day 5:** Blood culture #1 → *Viridans group Streptococcus*
- **Hospital Day 6:** Blood culture #2 → *Viridans group Streptococcus*
- **Hospital Day 6:** Fever 38.4°C documented
- **Hospital Day 3 labs:** ANC = 450 cells/mm³
- **Hospital Day 7 labs:** ANC = 380 cells/mm³
- **Patient is stem cell transplant recipient (6 months ago)**
- **No GI GVHD or diarrhea documented**

 **Is this a BSI event?**
If yes, what type and is it a CLABSI?

Case #11: Answer & Why

- **YES - LCBI 2** ✓
 - ✓ Fever >38.0°C
 - ✓ Same common commensal (Viridans group Strep) from 2 blood specimens on separate occasions
 - ✓ Elements within 7-day IWP
 - ✓ DOE = HD 5 (date first element occurs = first positive blood)
- **YES - MBI-LCBI 2** ✓
 - ✓ Fully meets LCBI 2
 - ✓ ≥2 matching specimens with ONLY Viridans group Strep (no other organisms)
 - ✓ Neutropenic: ANC <500 on 2 separate days (HD 3=450, HD 7=380)
 - ✓ Within 7-day IWP (HD 5±3 days)
- **NOT Counted as CLABSI** ✗
 - Doesn't meet MBI transplant criteria with no GI GVHD or diarrhea. Patient qualifies via neutropenia instead. MBI-LCBI excluded from CLABSI SIR.

58-year-old oncology patient with PICC line (stem cell transplant 6 months prior)
HD 3 ANC: 450 cells/mm³
HD 5: Blood culture #1 → Viridans group *Streptococcus*
HD 6: Blood culture #2 → Viridans group *Streptococcus*
HD 6: Fever (38.4°C)
HD 7 ANC: 380 cells/mm³

How to Spot the BSI—Every Time

- Spotting BSIs gets easier with practice—and the definition is your best tool.
- When we all use the same rules, we get data we can trust, compare, and act on.



You're a BSI Detective



Resources

- **NHSN CLABSI FAQs**
 - <https://www.cdc.gov/nhsn/faqs/faq-bsi.html>
- **NHSN Terminology Browser**
 - <https://cdcnhsn.clinicalarchitecture.com/SymedicalCDCNHSNViewpoint/#/search>
- **NHSN Patient Safety Component Manual**
 - https://www.cdc.gov/nhsn/pdfs/pscmanual/pcsmanual_current.pdf
 - Chapter 2 - Identifying Healthcare-associated Infections (HAI) for NHSN Surveillance
 - Chapter 4 - Bloodstream Infection Event (Central Line-Associated Bloodstream Infection and Non-central Line Associated Bloodstream Infection)

Thank you.

For any questions or concerns, contact the NHSN Helpdesk.

- **NHSN-ServiceNow** to submit questions to the NHSN Help Desk.
- Access new portal at <https://servicedesk.cdc.gov/nhsncsp>.
- If you do not have a SAMS login, or are unable to access ServiceNow, you can still email the NHSN Help Desk at nhsn@cdc.gov.

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 <https://www.cdc.gov/>
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