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Welcome to

California



Determination of Secondary Bloodstream Infections (BSI)

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Vicki Keller and Lori Schaumleffel
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health

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NHSN training courses

www.cdc.gov/nhsn

Objectives

1. Identify the relationship of site-specific infections to secondary bloodstream infections (BSI)
2. Review Secondary BSI Guide and apply to educational case scenarios
3. Describe pathogen assignment

Chapter 4 Appendix 1: Secondary Bloodstream Infection Guide

- Not Applicable to Ventilator-associated Events
- Guidance is central to making surveillance determination of primary vs secondary BSI



Defining “an organism cultured from blood is not related to an infection at another site”

- A BSI that is associated with an infection at another site is referred to as a Secondary BSI and never reported as an LCBI or CLABSI.
- A CLABSI may not be secondary to an infection at another site, i.e. CLABSI is a primary BSI
- A primary BSI occurs when there no other infection site identified as the source of the bloodstream infection

Secondary BSI Attribution Period

- The period in which a positive blood culture must be collected to be considered as a secondary bloodstream infection to a primary site of infection
- This period includes the Infection Window Period combined with the 14-day Repeat Infection Timeframe (RIT)
- This period is 14-17 days in length depending on when the date of event falls within the RIT

Note: A primary BSI will not have a Secondary BSI Attribution Period

Example: Secondary BSI Attribution Period

Secondary
BSI
Attribution
Period

(Infection
Window Period
+
Repeat
Infection
Timeframe)

Hospital Day	SUTI Criterion
9	
10	
11	Temp = 101.5° F
12	Temp = 102.1° F
13	Urine culture: >100,0 cfu/ml, <i>E. coli</i>
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

15 days

APPENDIX 1-Secondary Bloodstream (BSI) Guide

Secondary BSI scenarios

- The patient must meet one of the NHSN site specific definitions (CDC/NHSN Surveillance Definitions for Specific Types of Infections, UTI, PNEU or SSI),
- **And** either **1** or **2** below must also be true:

1. An organism identified from the site specific infection is used as an element to meet the site-specific criterion

AND

the blood specimen contains at least one matching organism to that site specific specimen, and is collected during the secondary attribution period.

OR

2. The positive blood specimen is an element used to meet the site-specific infection criterion, and is collected during the site specific infection's infection window period

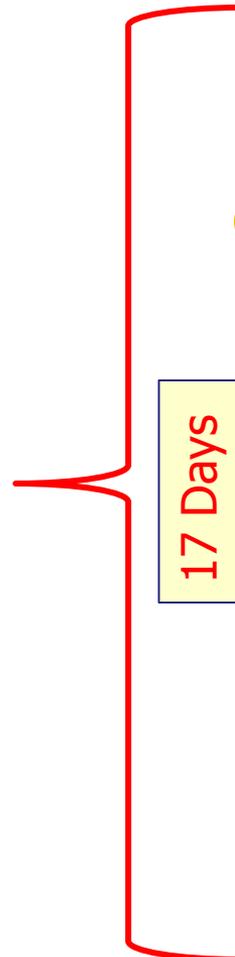
Secondary BSI Scenario 1 – Example 1

1. An organism identified from the site specific infection is used as an element to meet the site-specific criterion
AND
 - The blood specimen contains at least one matching organism to that site specific specimen, and is collected during the secondary attribution period.
 - **Example:** Patient meets criterion 1 for a symptomatic urinary tract infection (suprapubic tenderness and $>10^5$ CFU/ml of *E. coli*) and blood culture collected 5 days later grown *E. coli*. This is a SUTI with a secondary BSI and the reported organism is *E. coli*.

Secondary BSI Attribution Period

Secondary BSI Attribution Period

(Infection Window Period + Repeat Infection Timeframe)



Day	Criterion
9	
10	
11	
12	
13	Suprapubic tenderness, Urine culture: >100,0 cfu/ml, <i>E. coli</i>
14	
15	
16	
17	
18	Blood culture <i>E. coli</i>
19	
20	SUTI with secondary BSI Pathogen: <i>E. coli</i> Date of Event: Day 13
21	
22	
23	
24-26	

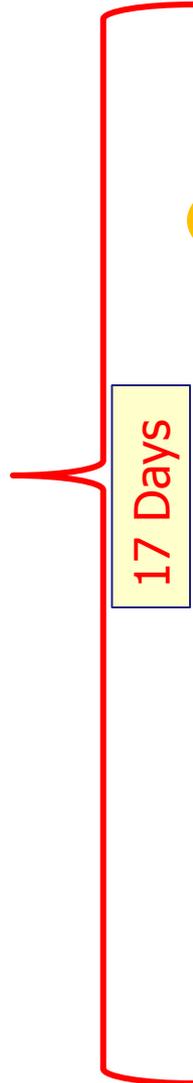
Secondary BSI Scenario 1 – Example 2

- Patient meets criterion 1 for a symptomatic UTI (suprapubic tenderness and $> 10^5$ CFU/ml of *E. coli* and $>10^5$ CFU/ml of *Candida glabrata*) and blood culture collected 5 days later within the secondary BSI attribution period grows *Candida glabrata* and *S. aureus*.
- This is a SUTI with *E. coli* and a primary BSI with *Candida glabrata* and *S. aureus* if no other primary infection site can be identified.
 - *Candida* is an excluded UTI organism
 - *S. aureus* does not match at least one organism found in the site specific culture (urine)

Secondary BSI Attribution Period

Secondary BSI Attribution Period

(Infection Window Period + Repeat Infection Timeframe)



Day	SUTI Criterion 1	LCBI Criterion 1	DAY	
9			9	
10			10	
11			11	
12			12	
13	Suprapubic tenderness, Urine culture: >100,000 cfu/ml, <i>E. Coli</i> & <i>C. glabrata</i>		13	
14			14	
15			15	
16			16	
17			17	
18	Blood culture: <i>E. glabrata</i> and <i>S. aureus</i>	Blood culture: <i>C. glabrata</i> and <i>S. aureus</i>	18	
19			19	
20	1) SUTI –Pathogen E. coli Date of Event: Day 13 2) LCBI- Pathogens: <i>C. glabrata</i> and <i>S. aureus</i> Date of Event: Day 18			20
21				
22				
23				
24-26				

Secondary BSI Scenario 2 – Example 1

2. The positive blood culture is an element used to meet the site-specific infection criterion, and is collected during the site specific infection's infection window period.
 - **Example-** Patient is febrile, has a new onset of cough and has positive chest x-ray indicating an infiltrate. *Pseudomonas aeruginosa* is isolated from the blood. Because the patient can meet PNU2 definition, the blood is considered a secondary BSI to a PNEU. No primary BSI would be reported.

Imaging Test Evidence	Signs/Symptoms	Laboratory
<p>Two or more serial chest imaging test results with at least one of the following^{1,2}:</p> <ul style="list-style-type: none"> • New or progressive and persistent infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤ 1 year old <p>Note: In patients <i>without</i> underlying pulmonary or cardiac disease (e.g., respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), <u>one definitive</u> chest imaging test result is acceptable.¹</p>	<p>At least one of the following:</p> <ul style="list-style-type: none"> • Fever ($>38.0^{\circ}\text{C}$ or $>100.4^{\circ}\text{F}$) • Leukopenia (≤ 4000 WBC/mm^3) or leukocytosis ($\geq 12,000$ WBC/mm^3) • For adults ≥ 70 years old, altered mental status with no other recognized cause <p>And at least one of the following:</p> <ul style="list-style-type: none"> • New onset of purulent sputum³ or change in character of sputum⁴, or increased respiratory secretions, or increased suctioning requirements • New onset or worsening cough, or dyspnea or tachypnea⁵ • Rales⁶ or bronchial breath sounds • Worsening gas exchange (e.g., O_2 desaturations [e.g., $\text{PaO}_2/\text{FiO}_2 \leq 240$]⁷, increased oxygen requirements, or increased ventilator demand) 	<p>At least one of the following:</p> <ul style="list-style-type: none"> • Organism identified from blood ^{8,13} • Organism identified from pleural fluid^{9,13} • Positive quantitative culture⁹ from minimally-contaminated LRT specimen (e.g., BAL or protected specimen brushing) • $\geq 5\%$ BAL-obtained cells contain intracellular bacteria on direct microscopic exam (e.g., Gram's stain) • Positive quantitative culture⁹ of lung tissue • Histopathologic exam shows at least one of the following evidences of pneumonia: <ul style="list-style-type: none"> ○ Abscess formation or foci of consolidation with intense PMN accumulation in bronchioles and alveoli ○ Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae

Site-specific criteria that require positive blood specimens

Organisms identified from blood as an element

Site	Element	Page
BURN	1	17-23
IAB	2b	17-19
JNT	3c	17-6
MEN	2c & 3c	17-8
OREP	3a	17-22
PNU2	Lab finding	6-6
PNU3	Lab finding	6-8
UMB	1b	17-25



Organisms identified from blood with imaging test evidence of infection

Site	Element	Page
BONE	3a	17-5
DISC	3a	17-5
GIT	2c	17-18
IAB	3b	17-19
SA	3a	17-9
USI	3b & 4b	17-26
ENDO	4a, 4b, 5a & 5b (specific organisms) 6e & 7e plus other criteria as listed	17-10

Secondary BSI Attribution Period

Secondary BSI Attribution Period

(Infection Window Period
+
Repeat Infection Timeframe)

15 Days

Day	PNU2 Criterion
9	
10	
11	New cough
12	Temp = 102.1°F
13	Chest X-Ray: Infiltrate
14	Chest X-Ray: Infiltrate
15	Blood culture: <i>Pseudomonas aeruginosa</i>
16	
17	
18	
19	PNU 2 with secondary BSI Pathogen: <i>P. aeruginosa</i> Date of Event: Day 11
20	
21	
22	
23	
24	

Secondary BSI Scenario 3 – Example 1

- If there is no matching organism identified from blood and site-specific specimen which is used to meet the site-specific infection definition, nor is an organism identified from blood specimen used to meet the site-specific infection – this is a Primary BSI.

Secondary BSI Scenario 3 – Example 1

Example:

- Patient with a needle aspirate from decubitus ulcer is + for *E. Coli*, swelling of wound edges and erythema (Day13) in Infection Window Period. Meets DECU criterion 1.
- Patient spikes a fever 7 days later and blood cultures (BC) show *S. aureus*.
- Because the organisms from the site and BC do not match (scenario 1) and no site-specific criterion that includes +BC as an element is met (scenario 2), both a site-specific infection (DECU) and a primary BSI would be reported.

DECU Criterion

DECU-Decubitus ulcer infection, including both superficial and deep infections

Decubitus ulcer infections must meet the following criterion:

1. Patient has at least **two** of the following signs or symptoms with no other recognized cause:
erythema, tenderness, or swelling of decubitus wound edges,

AND

Organisms identified from needle aspiration of fluid or biopsy of tissue from ulcer margin by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST).

Secondary BSI Attribution Period

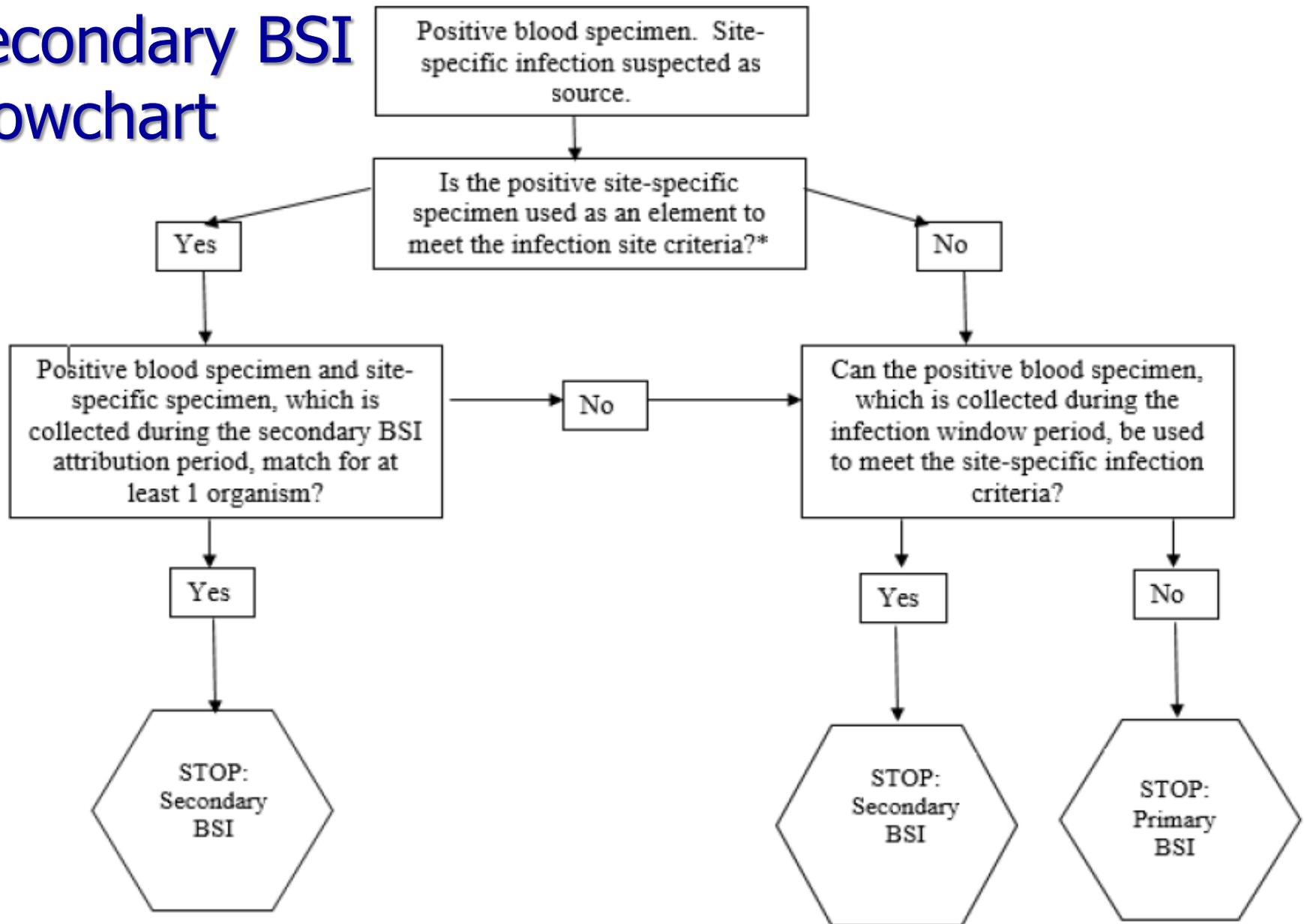
Secondary BSI Attribution Period

(Infection Window Period + Repeat Infection Timeframe)

Day	DECU	LCBI	DAY
9			9
10			10
11			11
12			12
13	Wound culture: <i>E.coli</i> Swelling & erythema wound		13
14			14
15			15
16			16
17			17
18			18
19			19
20	Fever	BC – <i>S. aureus</i>	20
21			21
22			22
23			23
24-26			24-26

- 1) DECU: *E. Coli*
Date of Event: Day 13
- 2) Primary BSI: *S. aureus*
Date of Event: Day 20

Secondary BSI Flowchart



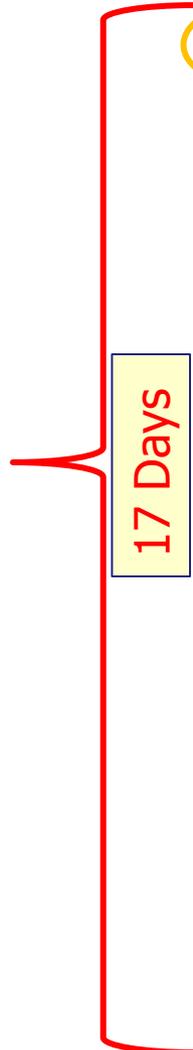
Secondary BSI Pathogen Assignment

- When pathogens are excluded from specific infection definitions, e.g. for UTI, PNEU, they are also excluded from being assigned as secondary BSI pathogens.
- Excluded pathogens must be attributed to another primary site-specific infection as a secondary BSI or must be identified as a primary BSI.
- Excluded pathogens can be found in the NHSN CAUTI, UTI and Other Urinary System Infection (USI) and the Ventilator Associated Events (VAE) and PNEU protocols.

Secondary BSI Attribution Period

Secondary BSI Attribution Period

(Infection Window Period + Repeat Infection Timeframe)



Day	SUTI Criterion 1	LCBI Criterion 1	DAY
9			9
10		LCBI Pathogen: <i>C. albicans</i> Date of Event day 14	
11	Temp= 101.5°F		
12	Temp=102.1°F		
13	Urine culture:>100,000 cfu/ml, <i>E. coli</i>		13
14	Blood culture: <i>E. coli</i> , and <i>C. albicans</i>	Blood culture: <i>C. albicans</i>	14
15			15
16			16
17			17
18	Urine culture:>100,000 cfu/ml, Enterococcus		18
19			19
20			20
21	SUTI –with Secondary BSI Pathogen: <i>E. coli</i>, & <i>Enterococcus</i> Date of Event: day 11		21
22			22
23			23
24			24-27

Secondary BSI Pathogen Assignment - continued

- When additional BSI pathogens are identified within a Repeat Infection Timeframe, they are added to the original infection event.
- Depending upon reporting requirements (federal, state, local) a BSI pathogen may be reported for more than one infection source.

Example: Assigned as a secondary BSI pathogen to 2 different primary infection sites, e.g., UTI and IAB)

Secondary BSI Attribution Period
 (Infection Window Period + Repeat Infection Timeframe)

Day	SUTI Criterion	IAB Criterion	DAY
8			8
9		Temp=101.5°F	9
10			10
11	Temp101.5°F	CT guided drainage of abdominal fluid collection: <i>E. coli</i>	11
12	Temp 102.5°F		12
13	Urine Culture: >100,000 cfu/ml, <i>E. coli</i>		13
14			14
15			15
17	Blood culture: <i>E. coli</i>	Blood culture: <i>E. coli</i>	17
16			16
17	SUTI with Secondary BSI		17
18	Pathogen: E. coli		18
19	Date of Event: 11		19
20			20
21			21
22-24			22

IAB (not-surgical) with Secondary BSI
Pathogen: E. coli
Date of Event:9

SUTI with Secondary BSI
Pathogen: E. coli
Date of Event: 11



Secondary BSI Attribution Period
 (Infection Window Period + Repeat Infection Timeframe)

Day	SUTI Criterion	LCBI Criterion	DAY
8			8
9		Blood Culture: <i>Staph aureus</i>	9
10			
11	Temp 101.5°F		
12	Temp 102.1°F		
13	Urine Culture: >100,000 cfu/ml, <i>E. coli</i>		13
14			14
15			15
17	Blood culture: <i>E. coli</i>	Blood culture: <i>E. coli</i>	17
16			16
17			17
18			18
19			19
20			20
21			21
22-24			22

LCBI
Pathogen: *Staph aureus* & *E.coli*
Date of Event: day 9

SUTI with Secondary BSI
Pathogen: *E. coli*
Date of Event: 11



Case Studies – Apply your Knowledge

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Scenario 1

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- 7/18: 64-year-old female admitted to your long-term acute care facility from acute care on 7/31 following a lengthy admission for stroke. Patient on a ventilator, central line in place and in use. Percutaneous endoscopic gastrostomy tube in use.
- Past Medical History: Hypertension, diabetic, 1 pack/day smoker, occasional alcohol use.

Scenario 1 continued

- 7/25: Central line still in place. Fever 100.6°F. PEG tube site slightly reddened, but without drainage.
- 7/26: Fever 101.0°F. Blood and urine culture collected. Remains on ventilator. Blood cultures positive for gram positive cocci. Antibiotics begun.
- 7/27: Fever 101.4°F. Final report of blood cultures collected on 7/26= positive for *S. aureus*. Urine cultures are negative.

Does this patient have an LCBI?

1. Yes, this patient has an LCBI criterion 1
2. No, this patient has a SKIN infection with secondary BSI

Rationale:

- ✓ Pathogen recovered from blood culture which is not related to infection at another site
- ✓ SKIN or ST criterion not met

Does this patient have a CLABSI?

1. Yes
2. No

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Rationale

- ✓ Date of event = 7/26
Note that LCBI criterion 1 has a single element, positive BC with a pathogen
- ✓ Must use the date of blood collection for date of event
- ✓ >2 days of central line use, and line in place on date of event, therefore CLABSI

DAY	LCBI Criterion	SKIN/ST Criterion	DAY
5	CL		5
6	CL		6
7	CL		7
8 (7/25)	T: 100.6°F Central Line Yes	Erythema	8
9 (7/26)	T: 101.0°F Blood culture: <i>Staph aureus</i>		9
10 (7/27)	T: 101.4°F		10
11			11
12			12
13			13
14			14
15			15
16			16
17-23			17

Note: No other SKIN or ST criteria elements

Scenario 2

- A 73-year-old Caucasian male seen in the ER on 6/10 with nausea and vomiting, abdominal pain and fever.
- History: Hypertension, hiatal hernia, esophageal reflux. Admission vital signs & labs: BP 153/73, P 69, T 102oF, Amylase 4,900, Lipase 4000, BUN 18, Cr 1.8, WBC 22.7, HCT 39. CT suggestive of pancreatitis.
- Admission: Admitted to the Medical ICU 6/10.
- Diagnosis Pancreatitis.
- Transferred to 5 West Medical on 6/30.

Scenario 2 continued

Date	Temp	Diagnostic Findings
6/10	102°F	73 y/o male, Admit Med/ICU , nausea, vomiting, abdominal pain, and fever. NG tube placed, NPO, IV fluids and supportive care. BC x 2.
6/13	Afebrile	Poor peripheral access, TPN, Central line placed (L subclavian), CXR verified position. BC results from 6/10 negative.
6/15	Afebrile	CHF (CXR shows fluid), Lasix administered to correct.
6/16	Afebrile	Increased abdominal pain & vomiting, Levaquin & Flagyl started.
6/30	Afebrile	DC'd TPN, PO fluids tolerated, transferred to 5 West Medical.
7/1	103°F	Nausea, vomiting, BC x2 collected, one is positive for coagulase-negative staphylococcus. Central line removed.
7/3	Afebrile	DC'd Levaquin & Flagyl and began Vancomycin x 10 days.
7/6	Afebrile	Inserted Rt. Subclavian central line to continue therapy.
7/16	Afebrile	Discharged.

Does this patient have a CLABSI?

1. Yes, this patient has a CLABSI because the catheter tip is positive for the same organism as the blood culture.
2. No. This patient's BSI is secondary to a GIT infection.
3. No, this patient does not have a CLABSI because only one blood culture is positive with a common skin commensal.

Rationale:

- ✓ LCBI 2 requires 2 matching blood cultures.
- ✓ Catheter tips are not blood cultures and cannot be used for LCBI criteria.
- ✓ Also, patient does not meet criteria for any GI infection

Scenario 2 continued

Date	Temp	Diagnostic Findings
6/10	102°F	73 y/o male, Admit Med/ICU , nausea, vomiting, abdominal pain, and fever. NG tube placed, NPO, IV fluids and supportive care. BC x 2.
6/13	Afebrile	Poor peripheral access, TPN, Central line places (L subclavian), CXR verified position. BC results from 6/10 negative.
6/15	Afebrile	CHF (CXR shows fluid), Lasix administered to correct.
6/16	Afebrile	Increased abdominal pain & vomiting, Levaquin & Flagyl started.
6/30	102°F	DC'd TPN, PO fluids tolerated, transferred to 5 West Medical.
7/1	103°F	Nausea, vomiting, BC x2 collected, Central line removed.
7/2	Afebrile	Nausea.
7/3	Afebrile	7/1 one BC=Coagulase-negative Staph, one BC from 7/1 S. epidermidis DC'd Levaquin & Flagyl and began Vancomycin x 10 days.
7/6	Afebrile	Inserted Rt. Subclavian central line to continue therapy.
7/16	Afebrile	Discharged.

Does this patient have a CLABSI?

1. Yes, this patient has a CLABSI meeting LCBI Criterion 2.
2. No. This patient's BSI is secondary to a GIT infection.
3. No, this patient does not have a CLABSI because the common commensals do not match.

Rationale:

- ✓ This is an LCBI because *S. epidermidis* is a coagulase negative staph (CNS), making them matching organisms, collected on the same day

What is the Date of Event?

1. 7/1 – the date of the blood culture.

2. 6/30 – the first date of the 1st element (fever) is present during the infection window period (IWP)

Rationale

- ✓ Date of event = 6/30
- ✓ Note that LCBI criterion 2 requires a symptom, which in this case is fever and it occurs for the first time on 6/30.
- ✓ >2 days of central line use and line in place on the date of event, therefore a CLABSI

DAY	LCBI Criterion
17 (6/26)	
18	
19	
20	
21 (6/30)	T: 102.0°F;
22 (7/1)	T: 103.0°F; 2 Sets BC collected: CNS & <i>S. epidermidis</i> Central line D/C
23	
24	
25	
26	
27	
28	
29-33	

To which unit should the CLABSI be attributed?

1. Medical ICU
2. 5 West Medical

Rationale:

- ✓ Apply the Transfer Rule: If date of event is on the day of transfer from one location to another, or the next day, the infection is attributed to the transferring location.
- ✓ In this case the patient was transferred from the Medical ICU to 5 West Medical on the date of event.

Scenario 3

- 11/2: 45 year-old, admitted to the hospital with multiple myeloma admitted for conditioning for stem cell transplant and had central line inserted the same day.
- Admission vital signs & labs: BP 11/70, P 82/ T 36°C, WBC 5.2, HGB 8, HCT 29.

Scenario 3 continued

Date	Temp	Diagnostic Findings
11/2	36°C	Admitted; L arm PICC line placed in interventional radiology.
11/3		Typed and cross matched for 2 units packed RBC for treatment of anemia. Blood transfused through PICC.
11/4		c/o abdominal pain & distension, hypoactive bowel sounds noted.
11/5	39.2°C	Medicated for abdominal pain (8 on 10 scale). Documented pain on abdominal palpation.
11/6	38.8°C	Continues to complain of abdominal pain unresolved with pain meds. Tenderness again noted on palpation of L lower abdomen.
11/7	39.0°C	BC x2 collected. Patient sent for CT scan of the abdomen. Report notes: "abscess present in L lower abdominal cavity". Drain placed in the L lower abdominal cavity and cultures sent. Antibiotics started.
11/9	37.8°C	BC from 11/7 positive for <i>Bacteroides fragilis</i> x2 Patient reports decreased abdominal pain.
11/12	36°C	Drain removed. Bowel sounds present. Follow-up CT scan reveals intra-abdominal abscess is resolved. Patient discharged.

Review IAB definition

Table 5: Site-specific criteria that require positive blood specimens

Organisms identified from blood as an element			Organisms identified from blood <u>with</u> imaging test evidence of infection		
Site	Element	Page	Site	Element	Page
BURN	1	17-23	BONE	3a	17-5
IAB	2b	17-19	DISC	3a	17-5
JNT	3c	17- 6	GIT	2c	17-18
MEN	2c & 3c	17-8	IAB	3b	17-19
OREP	3a	17-22	SA	3a	17-9
PNU2	Lab finding	6-6	USI	3b & 4b	17-26
PNU3	Lab finding	6-8	ENDO	4a, 4b, 5a & 5b (specific organisms) 6e & 7e plus other criteria as listed	17-10
UMB	1b	17-25			

IAB Definition Criterion

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3. Patient has at least **two** of the following signs or symptoms: fever ($>38.0^{\circ}\text{C}$), nausea*, vomiting*, abdominal pain*, or jaundice*

And at least **one** of the following:

- a. organisms seen on Gram stain or identified from drainage or tissue obtained during invasive procedure or from an aseptically-placed drain (e.g., closed suction drainage system, open drain, T-tube drain, CT guided drainage) by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not
- b. organisms identified from blood by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST) and imaging test evidence suggestive of infection (e.g., ultrasound, CT scan, MRI, radiolabel scans [gallium, technetium, etc.] or on abdominal x-ray), which if equivocal is supported by clinical correlation (i.e., physician documentation of antimicrobial treatment for intraabdominal infection). The organism(s) identified in the blood must contain at least one of the following organisms: *Bacteroides* spp., *Candida* spp., *Clostridium* spp., *Enterococcus* spp., *Fusobacterium* spp., *Peptostreptococcus* spp., *Prevotella* spp., *Veillonella* spp., or Enterobacteriaceae*

What type(s) of HAI does this patient have?

1. The patient has an IAB with *B. fragilis* and a CLABSI with *B. fragilis*
2. The patient has an IAB with *B. fragilis* and secondary BSI
3. The patient has a NEC infection with *B. fragilis* and a secondary BSI.

IAB 3B-Secondary BSI

What is the date of event?

Day	IAB Criterion
1	
2	
3	
4 11/4	Abdominal pain
5 11/5	T: 39.2°C, abdominal pain
6 11/6	T: 38.8°C, abdominal pain
7 11/7	T. 39.0°C CT result: intraabdominal abscess; Blood culture : <i>B. fragilis</i>
8	
9	
10	
11-17	

Non-SSI IAB with
Secondary BSI
Pathogen: B fragilis
Date of event: 11/4

Scenario 4

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- Day 1** 79 y/o male, admitted with 3 necrotic toes secondary to peripheral vascular obstructive disease. Taken to OR for toe amputation. Central line, which was in place on admission for antibiotics, is accessed.
- Day 6** Patient progressing well until fever spike of 101.3°F. Amputation site reddened, purulent material, collected for cultures. Blood collected for culture. Empiric antibiotics begun.
- Day 8** Wound cultures positive for *S. aureus*. Blood cultures positive for *E. faecium*.

Does this patient have a CLABSI?

1. Yes, the patient has a CLABSI with *E. faecium*.
2. No, the BSI is secondary to a superficial SSI.

Rationale

- ✓ The blood culture did not match an organism recovered from the wound culture nor can a positive blood culture be used to meet the superficial SSI criteria
- ✓ Therefore, unless there is another source of infection, this is a primary BSI
- ✓ Central line in place >2 days on date of LCBI, therefore CLABSI

Note Soft Tissue (ST) is not on the list

Organisms identified from blood as an element			Organisms identified from blood <u>with</u> imaging test evidence of infection		
Site	Element	Page	Site	Element	Page
BURN	1	17-23	BONE	3a	17-5
IAB	2b	17-19	DISC	3a	17-5
JNT	3c	17-6	GIT	2c	17-18
MEN	2c & 3c	17-8	IAB	3b	17-19
OREP	3a	17-22	SA	3a	17-9
PNU2	Lab finding	6-6	USI	3b & 4b	17-26
PNU3	Lab finding	6-8	ENDO	4a, 4b, 5a & 5b (specific organisms) 6e & 7e plus other criteria as listed	17-10
UMB	1b	17-25			

Scenario 5

1/1	60 y/o female admitted to the acute care hospital following a fall and pelvic fracture requiring surgery.
1/5	Patient has post op urinary retention requiring Foley catheterization.
1/10	Patient continues to require Foley catheterization.
1/11	Patient spikes a temp to 101.5°F.
1/12	Temp 102.1°F.
1/13	Urine cx collected >100,000 CFU/ml of <i>E. coli</i> .
1/14	BC collected – <i>E. coli</i> and <i>C. albicans</i> .
1/18	Urine cx collected >100, 000 CFU/ml <i>Enterococcus</i> .

Scenario 5

Is this a SUTI with a secondary BSI with *E. coli*, *C. albicans*, and *Enterococcus*?

- A. No. *Candida* is an excluded pathogen for UTI
- B. Yes. Because the *Candida* was isolated along with a matching organism to the urine. It is included as a urinary pathogen.

This is a SUTI 1 with a secondary BSI with *E. coli* and *Enterococcus*. *E. coli* in the blood is a matching organism to the site-specific infection. *Enterococcus* is within the SUTI repeat infection window, and is therefore added as a UTI pathogen.

★ *C. albicans* is an excluded organism for SUTI and since there is no other site of infection to which it can be attributed, is a primary LCBI

Scenario 6

DRAFT

8/14	A 41 y/o female has been in your unit of 2 weeks. She has a central line through which had been receiving hemodialysis since admission.
8/17	She develops fever of 39°C. Shaking & chills. BC X2 sent
8/19	BC + for <i>Pseudomonas aeruginosa</i> . Her central line insertion site shows inflammation but no other signs and there is no other documented infection.

Does this patient have a LCBI?

1. No, the patient does not have an LCBI
2. Yes, the patient has an LCBI with *P. aeruginosa*
3. Not Sure

Rationale:

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)
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Scenario 5 continued

Lets change this scenario and say that on 8/17 the patient's AV graft site is red and has a small amount of pus present.

Does this change your decision?

1. No, this patient still has a CLABSI
2. Yes, this is an LCBI but if reported, Central line should be "no". This will not be a CLABSI
3. Not sure.

Rationale

VASC-Arterial or venous infection

Note: If a patient meets the criteria for an LCBI in the presence of an intravascular infection report as an LCBI not as a VASC.

Arterial or venous infection must meet at least one of the following criteria:

1. Patient has organisms from extracted arteries or veins identified by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST)).
2. Patient has evidence of arterial or venous infection on gross anatomic or histopathologic exam.
3. Patient has at least one of the following signs or symptoms: fever ($>38.0^{\circ}\text{C}$), pain*, erythema*, or heat at involved vascular site*

AND

More than 15 colonies cultured from intravascular cannula tip using semiquantitative culture method.

4. Patient has purulent drainage at involved vascular site.
5. Patient ≤ 1 year of age has at least one of the following signs or symptoms: fever ($>38.0^{\circ}\text{C}$), hypothermia ($<36.0^{\circ}\text{C}$), apnea*, bradycardia*, lethargy*, pain*, erythema*, or heat at involved vascular site*

AND

More than 15 colonies cultured from intravascular cannula tip using semiquantitative culture method.

* *With no other recognized cause*

Updated 2016 Definition LCBI –VASC site

5. Occasionally, a patient with both a central line and another vascular access device develops a primary bloodstream infection (LCBI) that can clearly be attributed to the other vascular access site. If both pus at the insertion site and a culture of that pus, collected during the LCBI infection window period, has at least one matching organism to the blood specimen, the LCBI will not be considered associated with the central line. In this situation, enter “No” for the filed “Central Line?” in the NHSN application. You should, however, include the patient’s central line days in the summary denominator count. Vascular access devices included in this exception are limited to:

- a. Peripheral IV
- b. Arteriovenous fistula
- c. Arteriovenous graft
- d. Non-accessed central line (not accessed nor inserted during the hospitalization)

Scenario 5 continued

DRAFT

- Let's change this scenario one more time.
- On 8/18 the nurse contacts you and tells you she found a needle hidden in the patient's pannus and she believes the patient saved the oxycodone and injected it in her IV site and she documented her suspicions on 8/16.

Does this change your decision?

1. No, this patient still has a CLABSI
2. Yes, this is an LCBI, but if reported Central line should be "No". This will not be a CLABSI.
3. Not sure

Observed or suspected patient accession into vascular lines

1. A positive blood specimen meeting LCBI criteria, that is accompanied by **documentation** of observed or suspected patient accession into vascular access lines, within the BSI infection window period, will be considered ~~an LCBI~~, but not CLABSI for NHSN reporting purposes. A BSI RIT will be created. If reporting the BSI to NHSN, answer “No” to the event field “Central line?” If a facility is reporting CLABSIs electronically to NHSN via Clinical Document Architecture (CDA), no CLABSI should be reported for this event, since this BSI is not considered associated to the central line. If blood cultures collected after the BSI RIT are again positive, they must be investigated as a part of any BSI surveillance, Documentation of observed or suspected patient accession into vascular access lines, within the BSI infection window period, will again be necessary in order to determine that the LCBI is not central-line associated.

Summary

Accurate attribution of Secondary BSI requires you to

- Understand new key terms
- Identify the Infection Window and Date of Event
- Determine the Repeat Infection Timeframe
- Consider another primary source of infection
- Apply the new Secondary BSI guideline (Appendix 1 of Chapter 4)
- Assign pathogens as needed

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Questions?

For more information, please contact
HAIProgram@cdph.ca.gov

Thank you

