National Healthcare Safety Network Central Line Associated Bloodstream Infection (CLABSI)- Surveillance

SURVEILLANCE DEFINITIONS

CASE STUDIES

Introduction

- 7,991 CLABSI in 2017[1]
- Average cost of a HAI CLABSI is $48,108[1]
- Can result in increased hospital length stay, cost and risk of mortality
- Can be prevented through proper insertion techniques and management of the central line

Did covid-19 impact other IP metrics?

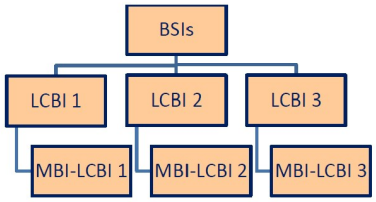
- The national SIR for CLABSIs increased significantly by 28% in 2020 Q2 versus 2019 Q2.[1]
- APIC Survey: Online survey including 1,083 IP members (October-November 5, 2020)[2]
  - 27.8% noted CLABSIs had increased
  - 21.4% noted CAUTIs had increased

Study Information	Rate/Baseline Rate	Comments
Study: Analysis of NHSN data for CLABSI early in the COVID-19 pandemic in the United States **Time Period:** April-June 2020 versus April-June 2019 (pre-COVID cohort) **Setting:** All US hospitals who were voluntarily submitting CLABSI data. Data from 936 acute care hospitals were included	(↑) 28% increase in national SIR (95% CI 20.0-33.6); from 0.68 in 2019 to 0.87 in 2020 Critical care units had the greatest SIR increase: 39%, from 0.75 in 2019 to 1.04 in 2020	• Device utilization increased from 0.21 in 2019 to 0.23 in 2020 • CLABSI reporting dropped by 17% nationally for April-June 2020

[1]Patel PR et al. Infect Control Hosp Epidemiol; published online March 15,2021

[2]https://apic.org/news/national-survey-shows-healthcare-facilities-implementing-ppe-crisis-standards-of-care/

Key Concepts



- **Laboratory Confirmed Bloodstream Infection (LCBI)**
  - Primary BSI: Organism cultured from the blood that is not related to an infection at another site.
    - Primary BSIs will create a 14-day BSI Repeat Infection Timeframe (RIT).
- **Secondary BSI**
  - Bloodstream infection that is not reported as an LCBI because it is associated with a site-specific infection at another body site which has seeded the bloodstream.
    - Secondary BSIs do not create a BSI RIT
    - Site-specific infection will create a site-specific RIT
    - Site-specific infection will created a Secondary BSI Attribution Period

Key Concepts

- **Infection Window Period (IWP)**
  - The 7-day period: in which all site-specific infection criterion must be met.
  - It includes the date of collection of the first blood specimen which identifies an organism in the blood, 3 calendar days before and 3 calendar days after.
- **Day of Event (DOE)**
  - LCBI 1:DOE will always be the date of the blood specimen collection which identifies an organism in the blood (will always be a recognized pathogen). *No symptom required*
  - LCBI 2 or 3:DOE will always be the first date an element that is used to meet the LCBI 2 or 3 criteria (symptom or the first of 2 cultures with matching common commensal organisms) occurs within the BSI IWP. *Symptom required* Event (DOE)

Key Concept

- **Secondary BSI Attribution Period (SBAP)**
  - The period in which a blood specimen must be collected for a secondary BSI attributed to a primary site of infection
  - ***SBAP = IWP + RIT***
  - ***14-17 days depending on DOE***
- **Eligible Organism**
  - Any organism eligible to meet LCBI or MBI-LCBI criteria
  - Does not include excluded organism

Key Concept

Excluded LCBI organisms

- Organisms that are parasites and viruses
- Organisms belonging to the following genera: *Campylobacter* spp., *C. difficile,* Enteropathogenic and Enterohemorrhagic *E. Coli. Salmonella* spp.,*Shigella* spp., *Listeria* spp., *Yersinia* spp., *Vibrio*
- Organisms belonging to the following genera cannot be used to meet **any** NHSN definition: *Blastomyces, Histoplasma, Coccidioides, Paracoccidioides, Cryptococcus, and Pneumocystis*

Key Concepts

Central line (CL):

- An intravascular catheter that terminates at or close to the heart, OR in one of the great vessels that is used for infusion, withdrawal of blood or hemodynamic monitoring.

Great Vessels for CLABSI Reporting	
Aorta	Subclavian veins
Pulmonary Artery	External iliac veins
Superior vena cava	Common iliac veins
Inferior vena cava	Femoral veins
Brachiocephalic veins	Umbilical artery/vein (neonate)
Internal jugular veins	

Key Concepts

- **Central Line Access**
  - Line placement, needle into the port, infusion or withdrawal through the line, flushes, hemodynamic monitoring
  - **Access = an eligible line for CLABSI events**
- **Eligible Central Line**
  - A central line (CL) that has been in place > 2 consecutive calendar days following the *first access* of the central line, in an inpatient location, during the current admission

NOTE: Eligible for CLABSI events until the day after removal from the body or patient discharge, whichever comes first.

Key Concepts

Types of Central Lines

- **Temporary**: A non-tunneled, non-implanted catheter
- **Permanent:** A Tunneled (including certain dialysis) catheters or implanted port
- **Umbilical catheter:** Inserted through the umbilical artery or vein in a neonate

Key Concepts

Lines that are <u>NOT</u> considered central lines for NHSN reporting

- Arterial Catheters
- Arteriovenous fistula
- Arteriovenous graft
- Ventricular Assist Devices (VAD)
- Peripheral IV's
- Atrial catheters (also known as transthoracic intra-cardiac catheters)
- Extracorporeal membrane oxygenation (ECMO)
- Intraaortic balloon pump (IABP) devices
- Hemodialysis reliable outflow (HERO) dialysis catheters
- Femoral arterial catheters

Introducer

Definitions

- **Central line days:**
  - The number of days a central line has been accessed to determine if a LCBI is a CLABSI
- **Denominator device days:**
  - The count of central lines on an inpatient unit that is recorded in the monthly denominator summary data
- **Central Line Associated BSI (CLABSI)**
  - 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

Knowledge Check

3/1	3/2	3/3	3/4	3/5	3/6	3/7
Admit with port in place	Port in place	Port in place	Port in place	Port in place	Port in place	Port in place
Not accessed	Not accessed	Accessed	Accessed	Port de-accessed at 2pm	Not accessed	Not accessed
		CL Day 1	CL Day 2	CL Day 3	CL Day 4	CL Day 5

1. When would the patient become eligible for a CLABSI? 3/5 – 3rd CL day
2. How long would this patient remain eligible for a CLABSI?

The port will remain eligible for a CALBSI unit it is removed or the patient is discharged, whichever comes first.

Knowledge Check

Patient admitted on 4/1 to an inpatient unit with a central line in place and fluid infusion started on 4/1.

4/3	4/4	4/5	4/6	4/7	4/8	4/9	4/10
CL in place	CL in place	CL removed at 9am	CL placed at 2pm	CL in place	CL in place	CL removed at 8am	No CL
CL Day 3	CL Day 4	CL Day 5	CL Day 6	CL Day 7	CL Day 8	CL Day 9	

1. When would the patient become eligible for a CLABSI? 4/3
2. How long would this patient remain eligible for a CLABSI? 4/3 thru 4/10

Blood Stream Infection Definitions

Considerations when investigating a BSI

1. What is the IWP?
2. Is it POA?
3. Is this secondary to another site specific source of infection?
4. If no secondary, is it LCBI 1, LCBI 2 or LCBI 3 based on organism & symptom if required?
5. Is it device associated?
6. Does it meet Mucosal Barrier Injury (MBI) definition?

Definitions

LCBI Criterion 1:

- Patient of any age has a recognized bacterial or fungal pathogen, not included on the NHSN common commensal list identified from one or more blood specimens obtained by a culture by non-culture based microbiologic testing (NCT) methods to the genus or species level

AND

- Organism(s) cultured from blood is not related to an infection at another site (Appendix B Secondary BSI Guide)

Key Concepts

LCBI Criterion 1:

- Blood specimen used to set the IWP
- DOE will always be the collection date of the first positive blood specimen
  - No additional elements (in other words, no sign or symptom such as fever) are needed to meet LCBI criterion 1.
- If a patient meets both LCBI 1 and LCBI 2, report LCBI 1 with the recognized pathogen as pathogen #1 and the common commensal at pathogen #2
- For the purposes of meeting LCBI-1, NCT is defined as a methodology that identifies an organism directly from a blood specimen without inoculation of the blood specimen to any culture media. For instance, NCT does not include identification by PCR of an organism grown in a blood culture bottle or any other culture media.

Definitions

LCBI Criterion 2

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

AND

- Organism(s) cultured from blood is <u>not</u> related to an infection at another site (Appendix B Secondary BSI Guide)

AND

- The same common commensal is cultured from <u>two</u> or more blood cultures drawn on separate occasions.

Definitions

LCBI Criterion 3

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

AND

- Organism(s) cultured from blood is not related to an infection at another site (Appendix B Secondary BSI Guide)

AND

- The same NHSN common commensal is cultured from two or more blood cultures drawn on separate occasions.

Key Concepts

LCBI Criterion 2 and 3:

- Blood from as least two separate blood draws collected on the same or consecutive calendar days
  - The two matching common commensal specimens represent a single element for use in meeting LCBI 2 and 3 criteria
  - The date of the first blood specimen sets the IWP
- Two separate site preparations (decontamination steps)were performed during specimen collection
- The blood cultures are assigned separate accession numbers, processed individually and are reported separately in the final laboratory report.

Key Concepts

LCBI Criterion 2 and 3:

- Criterion elements must occur within the 7-day IWP which includes the collection date of the positive blood specimen, the 3 calendar days before and the 3 calendar days after.
- At least one element (specifically, a sign or symptom of fever, chills or hypotension) is required to meet LCBI 2 and 3: the LCBI 2 or 3 DOE will always be the date the first element occurs for the first time during the IWP, whether that be a sign or symptoms or the positive blood specimen.

Key Concept

Determining matching organisms:

- If the organism is less definitively identified in one culture than the other, the identifications must be complementary.
  - Example: A blood culture growing *CNS* and a blood culture growing *S. epidermidis* are considered a match because *S. epidermidis is a CNS*
  - Example: A blood culture growing *CNS* and a blood culture growing *Staphylococcus* are NOT considered matching because *Staphylococcus can be either CNS or CPS*

Note: How to Report Speciated & Un-Speciated Results table can be found on page 4-19 of the NHSN BSI protocol

Key Concept

Determining matching organisms:

- If genus and species are identified in both specimens, they must be the same
  - ***Example:*** *A blood specimen reported as Enterobacter cloacae and an intraabdominal specimen of Enterobacter cloacae are matching organisms.*
  - ***Example:*** *A blood specimen reported as Enterobacter cloacae and an intraabdominal specimen of Enterobacter aerogenes are NOT matching organisms as the species are different*.
- If the organism is less definitively identified than the other, the lesser must be identified at least to the genus level:
  - **Example**: A surgical wound growing *Pseudomonas* spp. and a blood specimen growing *Pseudomonas aeruginosa* are considered a match at the genus level and therefore the BSI is reported as secondary to the SSI.

Exception: *A blood specimen reported as Candida albicans and a culture from a decubitus reported as yeast not otherwise specified are considered to have matching organisms because the organisms are complementary, i.e. Candida is a type of yeast*

Knowledge Check

- 3/3: 77 year old male admitted to MICU for COVID.
- 3/4: **C**entral line placed in MICU.
- 3/9**:** Fever and chills and blood cultures collected
  - Culture positive for *Serratia marcescens*(recognized pathogen, not a CC)
  - No other source of infection was identified

1. Does the patient meet criteria of an LCBI?
2. If yes,
   1. what type: LCBI 1, 2 or 3?
   2. Is it a CLABSI?
   3. What is the day of event?
3. If no, why?

Knowledge Check

- 12/18: 65 year old female is admitted to the 6ONC and a port was placed for chemotherapy.
- 12/19: She develops a temp of 39°C
- 12/20: Blood cultures are collected with the same time stamp but different accession numbers
  - *Coagulase-negative Staphylococcus (CNS)* x2 identified from both cultures
  - No other source of infection is identified

1. Does the patient meet criteria of an LCBI?
2. If yes,
   1. what type: LCBI 1, 2 or 3?
   2. Is it a CLABSI?
   3. What is the day of event?
3. If no, why?

Definitions

Mucosal Barrier Injury Laboratory-Confirmed Bloodstream Infection -MBI-LCBI 1

- Patient of any age meets LCBI 1 with at least one blood culture identified by a culture or non-culture based microbiologic testing method with ONLY intestinal organisms from the MBI Organism List and patient meets at least one of the following:
  1. Allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood culture:
     - Grade III or IV GI graft versus host disease (GI GVHD)
     - ≥ 1 liter diarrhea in a 24 hour period (< 18 years ≥ 20 ml/kg in a 24 hour period) with onset on or within 7 calendar days before the date the positive culture was obtained
  2. Is neutropenic, defined as at least 2 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.

Definitions

MBI-LCBI 2

- Patient of any age meets LCBI 2 when the blood cultures are growing only Viridans Group *streptococcus* or *Rothia* spp. but no other organisms

MBI-LCBI 3

- Patient < 1 year of age meets LCBI 3 for when the blood cultures are growing only Viridans group *streptococcus* or *Rothia* spp. but no other organisms

- With at least two matching blood specimens
- Identified by culture

Defintions

MBI- LCBI 2 and 3 cont.

- **AND** patient meets at least one of the following:
  1. Allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood culture:
     - Grade III or IV GI graft versus host disease (GI GVHD)
     - ≥ 1 liter diarrhea in a 24 hour period (< 18 years ≥ 20 ml/kg in a 24 hour period) within onset on or within 7 calendar days before the date the positive culture was obtained
  2. Is neutropenic, defined as at least 2 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

Key Concepts

- ANC/WBC levels should NOT be used to set the date of MBI-LCBI. The date the patient first meets the LCBI criteria is the date of the MBI-LCBI
- Any combination of ANC and/or WBC values can be used to meet neutropenic criteria provided they are collected on separate days within the IWP
- When a blood specimen positive for an organism not included on the NHSN MBI organism list is collected during the BSI RIT of an MBI-LCBI, the initial MBI-LCBI event is edited to an LCBI and the identified non-MBI organism is added.
- All CLABSI, whether LCBI or MBI-LCBI, must be reported if CLABSI is part of your Monthly Reporting Plan
- When reporting an LCBI, it is required to indicate which of the underlying conditions of the MBI-LCBI criterion was met, if any.
- The CLABSI SIR reports exclude MBI-LCBI events and MBI-LCBI events have their own SIR reports.

		Day -7	Day -6	Day -5	Day -4	Day -3	Day -2	Day -1	Day 1*	Day 2
A	WBC	100	800	400	300	ND	ND	320	400	230
B	ANC	ND	410	130	ND	ND	120	110	ND	110

MCBI-LCBI 1

+ BC w/Candida spp. x1

MCBI-LCBI 2

+ BC with Viridans strep x2 and fever > 38°C

Key Concept

- All blood cultures (regardless of collection method) must be included in surveillance if participating in NHSN CLABSI surveillance
  - Bloods collected via venipuncture
  - Bloods collected through vascular catheters
- Cannot be considered a contaminant unless single unmatched Common commensal (surveillance vs. clinical determination)
- Only Primary BSIs create a 14 day RIT
- Do not report a BSI that has a DOE within the BSI RIT.
  - Do add additional orgnaism identified that are eligivle for BSI events to the original BSI.

CLABSI Exclusions

- The event is reported to NHSN but is NOT considered central line associated.
- The Central Line field is marked “Yes” if an eligible central line has been in place for more than 2 consecutive calendar days on the BSI DOE and is still in place on the BSI DOE or the day before.
- The events do not contribute to the CLABSI SIR measure.
- In each instance where the date of event of subsequent positive blood specimens are outside of the established BSI RIT, meeting the exclusion criteria, the subsequent positive blood must be investigated as primary or secondary to another site-specific infection.
  - The CLABSI exclusion criteria must be met again in a new BSI IWP to determine if the positive blood specimen is central line associated.
- Meeting LCBI criteria in exclusion situations will result in setting a BSI RIT and any associated device days should be included in counts for denominator summary data.

CLABSI Exclusions

- **Extracorporeal life support (ECLS or ECMO)**
  - A BSI meeting LCBI criteria with an eligible CL where ECMO is present for > 2 days on the BSI DOE and is still in place on the DOE or day before is considered an LCBI.
- **Ventricular assist device (VAD)**
  - A BSI meeting LCBI criteria with an eligible CL where a VAD is present for > 2 days on the BSI DOE and is still in place on the DOE or day before is considered an LCBI.
- **Patient Injection**
  - A BSI meeting LCBI criteria that is accompanied by documentation of observed or suspected patient injection in the vascular access device will be considered LCBI
  - This is specific to INJECTION and not tampering or manipulating
  - Documentation must occur within the BSI IWP

CLABSI Exclusions

- **Epidermolysis bullosa (EB)**
  - Documentation of a diagnosis during current admission
- **Munchausen Syndrome by Proxy (MSBP) or Factitious Disorder Imposed on Another (FDIA)**
  - Documentation or a diagnosis of known or suspected MSBP during the current admission

CLABSI Exclusions

- **Pus at the Vascular Access Site**
  - All the following elements are needed:
    - Central line and another vascular access device
    - Pus at the site at one of the below vascular access devicse
    - Specimen collected from that site with at least one matching organism to an organism identified in blood

Vascular Access Devices Included In This Exception	
Arterial catheters unless in the pulmonary, aorta or umbilical artery	Hemodialysis reliable outflow (HERO) dialysis catheters
Arteriovenous fistulae Non-accessed CL (those neither inserted nor used during current admission)	Intra-aorta balloon pump (IABP) devices
Arteriovenous grafts	Arteriovenous fistulae
Atrial catheters	Peripheral IV or Midlines

Definitions

Secondary BSI:

In order for a bloodstream infection to be determined to be secondary to another site of infection the following requirements must be met.

- At least one organism from the blood specimen matches an organism identified from the site-specific specimen that is used as an element to meet the NHSN site-specific infection criterion AND the blood specimen is collected during the secondary BSI attribution period

OR

- An organism identified in the blood specimen is an element that is used to meet the NHSN site-specific infection criterion, and therefore is collected during the site-specific infection window period

SBAP = Infection Window Period **PLUS** the Repeat Infection Timeframe

Secondary BSI Guide

Table B1 Chapter 4
page 36

Table B1: Secondary BSI Guide: List of all NHSN primary site-specific definitions available for making secondary BSI determinations using Scenario 1 or Scenario 2

Scenario 1	Scenario 2
A positive blood specimen must contain at least **one eligible matching organism** to the site-specific specimen	Positive blood specimen must be an **element** of the **site-specific definition**
And the blood specimen is collected in the site-specific **secondary BSI attribution period**	**And** blood specimen is collected in the site-specific **infection window period**
And an eligible organism **identified from the site-specific specimen** is used as an element to meet the site-specific definition	And an eligible organism **identified in a blood specimen** is used as an element to meet the site-specific definition

Site	Criterion
ABUTI	ABUTI
BONE	1
BRST	1
CARD	1
CIRC	2 or 3
CONJ	1a
DECU	1
DISC	1
EAR	1, 3, 5 or 7
EMET	1
ENDO	1
EYE	1
GE	2a
GIT	2a, 2b (only yeast)
IAB	1 or 3a
IC	1
JNT	1
LUNG	1
MED	1
MEN	1
ORAL	1, 3a, 3d (only yeast)
OREP	1
PJI	1 or 3e
PNEU	2 or 3
SA	1
SINU	1
SSI	SI, DI or OS
SKIN	2a
ST	1
UMB	1a
UR	1a or 3a
USI	1
SUTI	1a, 1b or 2
VASC *only as SSI*	1
VCUF	3

Site	Criterion
ABUTI	ABUTI
BONE	3a
BURN	1
DISC	3a
ENDO	4a, 4b, 5a or 5b (specific organisms) 6e or 7e plus other criteria as listed
GIT	1b or 2c
IAB	2b or 3b
JNT	3c
MEN	2c or 3c
OREP	3a
PNEU	2 or 3
SA	3a
UMB	1b
USI	3b or 4b

Key Concepts

- **Exception**: **Necrotizing enterocolitis (NEC) in infants ≤1 year of age.**
  - This definition does not included criteria for a matching site specific specimen nor an organism identified in blood that can be used to meet criteria.
  - However a BSI is considered secondary to NEC if the patient meets one of the two NEC criteria AND an organism from blood, collected during the SBAP is an LCBI pathogen or the same common commensal from 2 or more blood specimens collected on the same or consecutive days.

- **Note: Endocarditis (ENDO) definition:**
  - The SBAP includes the 21 day IWP and all subsequent days of the patient current admission.
  - The secondary pathogen assignment is limited to organisms identified in blood specimens that match the organism used to meet the ENDO definition

Key Concepts

- Additional eligible pathogens recovered during the RIT from the same type of infection are added to the event.
- The organism in the blood culture must be eligible for use in the site-specific infection criteria.
- An organism may be attributed to more than 1 type of infection
- A positive blood culture on admission does not automatically set a BSI RIT.
  - It is necessary to determine if the organism found on admission was primary or secondary to determine if subsequent blood cultures must be investigates as a possible LCBI
  - Only a primary BSI sets an RIT.
  - Secondary BSIs do not, the RIT is set by the primary type of infection

Key Concept

- 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.
- Antibiograms of the blood and potential primary site isolates do not have to match.
- Catheter tip cultures cannot be used in place of blood specimens for meeting LCBI citerai
- 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

Key Concepts

Scooping

- If a single blood culture contains an organism that matches the site specific specimen and an organism that does not match:
  - Scoop up the non-matching organism
  - The non-matching organism is adopted one time only
  - If there are subsequent blood cultures with the orphaned organism, you must assess these blood cultures for LCBI criteria.
  - If a blood culture contains ONLY a non-matching organism, it must be assessed for a LCBI

Knowledge Check

- 9/1 65 year old male with fever and urine culture collected
  - Urine culture positive for 100K *E.coli*
- 9/7 pt with fever and hypotension, blood cultures collected
  - Blood cultures positive for *E.coli* and *Entercoccus* sp.

1. Does the patient meet for a primary infection type?
   - If yes, what type and what is the DOE?
   - If no, why?
2. Does the patient meet LCBI?
   2. If yes, is this primary or secondary?
   3. If primary, why?
   4. If secondary, what is the primary infection type and what organisms are reported?

CLABSI surveillance

Device Days:

- A daily count of the number of patients with a specific device in the patient care location during a time period. Count at the same time each day.
- Only one central line per patient is counted per calendar day, regardless of the number of central lines present
- All central lines (of any type) are counted in the same way
- Include the line in the CL denominator summary data beginning the first day it is present in an inpatient location, regardless of access
- If electronic data used validate with manual count for a minimum of 3 months (+/- 5%)

Resources:

CLABSI Surveillance

http://www.cdc.gov/nhsn/acute-care-hospital/clabsi/index.html

Patient Safety Component Manual

- Chapter 2-Identifying HAI for NHSN Surveillance
- Chapter 4-Bloodsteam Infection Event
- Chapter 16-NHSN Key Terms
- Chapter 17- Surveillance Definitions for Specific Types of Infections

- FAQs

Case Studies & Discussion

Case Study #1

- 2/4: 32-year-old female admitted to the ED with fever (102oF) and abdominal pain. Patient has a port in place at the time of admission.
  - Past medical history – cervical cancer & cardiomyopathy due to a history of drug use
- 2/5: Admitted to the oncology floor and port is flushed.
- 2/6: Patient complains of pain at the port site (10/10) and the insertion site is red. Narcotics requested. 15 mg of oxycodone is given.
- 2/8: Blood cultures collected- Positive for: – *Micrococcus* x 1, *Candida albicans*, and *Enterococcus faecalis.*

1. Does this meet for LCBI?
   1. If yes, what type LCBI 1, LCBI 2 or MBI LCBI 1
   2. If no, why not?

2. Is this an HAI or a POA event?

Case Study #2

- 2/10 – 55 year old female with fever and positive blood cultures.
  - Her port is de-accessed and port removal is scheduled on 2/11
- 2/11- A peripherally Inserted Central Catheter (PICC) is placed for temporary access.
- 2/11 – The patient leaves the floor to visit with friends. The IV infusion is disconnected from the CL and the CL is clamped by the nurse so the patient can leave the unit.

Case Study #2 cont..

- When the patient returns to the unit, she is slurring words. The end-cap is missing from one of the ports, and the CL is un-clamped. Nurses suspect the patient tampered w/ the CL while off the floor.
- The nurse informs the physician is informed of events.
- The physician ask the patient about the event and the patient admits to using drugs. The nurse documents suspicion of line injection on 2/11.
- 2/12 - The patient spikes a fever of 38.4°C
  - Blood cultures are collected & are positive for *Enterobacter cloacae*, *Pseudomonas aeruginosa*, and *Candida glabrata*. The patient transferred to ICU.

1. Is the patient self-injection exclusion met? **Yes**

Case Study #2 cont.

- Which statement is eligible for use to meet this CLABSI exclusion?

1. Patient is suspected of tampering with her central line.
2. Patient returned to the unit slurring words and. Central line was uncapped and unclamped after returning to the unit.
3. Nurse documents there is a suspicion for line injection and notifies the physician.
4. When asked by the physician, patient admits to use of drugs

Case Study #3

- 2/22: Inpatient develops arrhythmias, lower extremity edema, and complains of shortness of breath-patient has a cardiac arrest.
  - R femoral TLC inserted
  - Chest X-ray shows severe, late-stage heart failure due to cardiomyopathy
  - VAD inserted to relieve heart failure
- 2/25: VAD remains in place, patient develops acute renal failure & spikes fever (101.6oF)
  - HD catheter placed and
  - blood cultures positive for *Enterococcus faecium* and *Klebsiella oxytoca*

1. Does this meet for LCBI?
   1. If yes, what type LCBI 1, LCBI 2 or MBI LCBI 1
   2. If no, why not?


Any
Questions