

Surveillance and Surveillance Definitions - NHSN

Jo Ellen Walton, BSN, RN, CIC

Surveillance in Acute Care Facilities

- ❖ Central Line Associated Bloodstream Infections (CLABSIs)
- ❖ Catheter Associated Urinary Tract Infections (CAUTIs)
- ❖ Ventilator Associated Events (VAEs)
- ❖ Surgical Site Infections (SSIs)
- ❖ LabID Events
 - ❖ MRSA Bacteremia
 - ❖ Clostridium difficile Infection (CDI)

Healthcare Facility HAI Reporting Requirements to CMS via NHSN-- Current or Proposed Requirements

CMS Reporting Program	HAI Event	Reporting Specifications	Reporting Start Date
Hospital Inpatient Quality Reporting (IQR) Program	CLABSI	Adult, Pediatric, and Neonatal ICUs	January 2011
	CAUTI	Adult and Pediatric ICUs	January 2012
	SSI: COLO	Inpatient COLO Procedures	January 2012
	SSI: HYST	Inpatient HYST Procedures	January 2012
	MRSA Bacteremia LabID Event	FacWideIN	January 2013
	<i>C. difficile</i> LabID Event	FacWideIN	January 2013
	Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel	January 2013
	Medicare Beneficiary Number	All Medicare Patients Reported into NHSN	July 2014
	CLABSI	Adult & Pediatric Medical, Surgical, & Medical/Surgical Wards	January 2015
	CAUTI	Adult & Pediatric Medical, Surgical, & Medical/Surgical Wards	January 2015

Definitions

CDC definition of a healthcare-associated infection (HAI) - an infection in which the date of event occurs on or after the 3rd calendar day of admission to an inpatient location.

Date of Event (DOE) - the date the first element used to meet an NHSN site-specific infection criterion occurs for the first time within the seven-day infection window period.

Infection Window Period (IWP) - the 7-days during which all site-specific infection criteria must be met. It includes the date the first positive diagnostic test that is used as an element of the site-specific infection criterion was obtained, the 3 calendar days before and the 3 calendar days after.

Diagnostic Test Examples

- ❖ lab specimens
- ❖ imaging test
- ❖ procedure or exam
- ❖ physician diagnosis
- ❖ initiation of treatment

Localized Sign or Symptom Examples

- ❖ Diarrhea
- ❖ Site specific pain
- ❖ Purulent exudate



Definitions cont.

Location of attribution - the inpatient location where the patient was assigned on the date of event.

❖ Transfer rule - if the date of event is the day of transfer/discharge, or the next day, the infection is attributed to the transferring location.

Adm day Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Location of attribution
ICU	ICU	ICU	ICU - 5 E Date of event for HAI	5E	5E	HAI is attributable to ICU
CCU	CCU	CCU - 4G	4G	4G	4G Date of event for HAI	HAI is attributable to 4G
CTVU	CTVU	CTVU - 4H 4H - CCU	CCU Date of event for HAI	CCU	CCU	HAI is attributable to CTVU

Definitions cont.

Repeat Infection Timeframe (RIT) - the 14-day timeframe during which no new infections of the same type are reported.

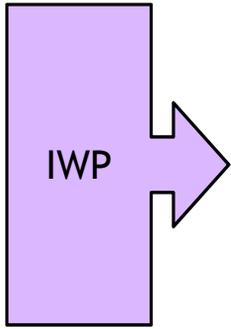
- ❖ The date of event is Day 1 of the RIT.
- ❖ Additional pathogens identified during the RIT from the same type of infection are added to the event.
- ❖ The RIT applies during a patient's single admission, including the day of discharge and day after. The RIT does not carry over from one admission to another, even if readmission is to the same facility.
- ❖ The RIT for endocarditis (ENDO) is extended to include the remainder of the patient's current admission.

Definitions cont.

Secondary Bloodstream Infection (BSI) Attribution Period - the period in which a blood specimen must be collected for a secondary BSI to be attributed to a primary site infection. It includes the Infection Window Period combined with the RIT. It is 14-17 days in length depending on the date of event.

- ❖ In order for a BSI to be determined secondary to another site of infection, an NHSN site-specific definition must be met AND
 - ❖ at least one organism from the blood specimen matches an organism identified from the site-specific infection element OR
 - ❖ the organisms identified in the blood specimen is an element that is used to meet the NHSN site-specific infection criteria, and is collected during the infection window period

Note: The infection window period, POA, HAI, and RIT do not apply to SSI, VAE, or LabID Events.



Date	Hosp day	Device day	SUTI criterion	2nd BSI	Room
8/3	4	2			
8/4	5	3			
8/5	6	4			
8/6	7	5	Temp 101.5F		
8/7	8	6	Temp 100.5F		
8/8	9	7	urine cx >100,000cfu Ecoli		
8/9	10	8			
8/10	11	9			
8/11	12	10			
8/12	13	11			
8/13	14	12			
8/14	15	13			
8/15	16	14			
8/16	17	15			
8/17	18	16			
8/18	19	17			
8/19	20	18			

RIT

Date of Event

Secondary BSI Attribution Period



NEW in
2017

2017 Organism Lists Updates

- Added newly identified organisms
- Reflect changes to organism taxonomy
- Expands the Mucosal Barrier Injury-Laboratory Confirmed Bloodstream Infection (MBI-LCBI) list
- 498 organisms → 1,003 organisms
- 32 genera → 89 genera
- Expands the Common Commensal list
 - 431 organisms → 540 organisms → **669 organisms**
 - **Most are Gram-positive rods (diphtheroids/noncorynebacterial coryneforms)**
- 7 genera → 13 genera
- <https://www.cdc.gov/nhsn/acute-care-hospital/clabsi/index>
- Anticipated additions to 2018 Common Commensal list can be found at <https://www.cdc.gov/nhsn/pdfs/newsletters/nhsn-members-meeting-2017.pdf>



2018
Anticipated
Updates

Chapter 17: Other Definitional Changes for 2017

ORAL -added back to criterion 3a, “from mucosal scrapings or exudate”

- 3. Patient has at least one of the following signs or symptoms with no other recognized cause: ulceration, raised white patches on inflamed mucosa, or plaques on oral mucosa

And at least one of the following:

- a. virus identified from mucosal scrapings or exudate 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).

LUNG, SA, and NEC-provided guidance to allow clinical correlation to be used in cases where imaging tests are equivocal for infection

- (LUNG 3) Patient has imaging test evidence of abscess or infection (excludes imaging test evidence of pneumonia) which if equivocal is supported by clinical correlation (i.e., physician documentation of antimicrobial treatment for lung infection).

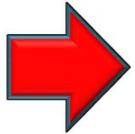


NEW in
2017

Chapter 17: Other Definitional Changes for 2017 (cont.)

ENDO (endocarditis)

- Extended the Infection Window Period to 21 days total: 10 days before the diagnostic test, the day of the diagnostic test and 10 days after the diagnostic test
- Extended the ENDO Repeat Infection Timeframe to the duration of the admission
- Extended the ENDO Secondary Bloodstream Infection Attribution Period to the entire duration of the admission for the organism that is used to meet the ENDO criterion



2017 CDC/NHSN Patient Safety Manual Summary of Revisions can be found at <https://www.cdc.gov/nhsn/pdfs/pscmanual/psc-january-2017-revisions.pdf>

Central Line Associated Bloodstream Infection (CLABSI)

Definitions:

Primary bloodstream infection (BSI) - lab-confirmed bloodstream infection (LCBI) that is not secondary to an infection at another body site.

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

- ❖ Aorta, pulmonary artery, superior and inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, femoral veins, and the umbilical artery/vein in neonates.
- ❖ Not considered central lines: arterial catheters, arteriovenous fistula or graft, Extracorporeal membrane oxygenation (ECMO), hemodialysis reliable outflow dialysis catheters, Intra Aortic Balloon Pump (IABP) device, central line which is not accessed or inserted during the hospitalization, peripheral intravenous (PIV) catheters, midline catheters, and Ventricular Assist Devices (VADs).



ECMO, VADs,
Midlines
added in
2017

CLABSI

Definitions (cont.)

Infusion - the introduction of a solution through a blood vessel via a catheter lumen. Includes continuous infusions such as IV fluids, TPN, meds; or intermittent, such as IVPB, blood transfusions, hemodialysis, or flushes.

CLABSI - A lab-confirmed BSI (LCBI) where a central line was in place for >2 calendar days on the date of event, with day of device placement being day 1

AND

The line was in place on the date of event or the day before.

- ❖ If the central line was in place for >2 days then removed, the date of event of the LCBI must be the day of removal or the next day to be a CLABSI
- ❖ If the patient is admitted or transferred into a facility with an implanted port in place, and this is the only central line, the day of first access in an inpatient location is considered day 1.

CLABSI Criterion 1

- ❖ Patient of any age has a recognized pathogen identified from one or more blood specimens by a culture or non culture based microbiologic testing method

AND

- ❖ Organism(s) identified in blood is not related to an infection at another site

AND

- ❖ A central line was in place >2 calendar days on the date of event

Pt adm - day 1	Day 2	Day 3	Day 4	Day 5	Day 6 Date of Event	Day 7	Day 8
PIV	PICC placed day 1	PICC day 2	PICC day 3	PICC day 4	PICC day 5	PICC day 6	PICC day 7
Cultures or other source of infection					BCx – Staph aureus		

CLABSI Criterion 2

- ❖ Patient of any age has a least one of the following s/sx: fever ($>38^0/100.4^0$), chills, or hypotension

AND

- ❖ Organism(s) identified from blood is not related to an infection at another site

AND

- ❖ The same NHSN common commensal is identified from two or more blood specimens drawn on separate occasions.
 - Separate occasions - two separate blood draws were collected on the same or consecutive calendar days, and were collected in a manner which suggests that two separate blood draw site preparations were performed.

AND

- ❖ A central line was in place >2 calendar days on the date of event

<https://www.cdc.gov/nhsn/xls/master-organism-com-commensals-lists.xls>

CLABSI Criterion 2

8/1 – pt adm	8/2	8/3	8/4 Date of Event	8/5	8/6	8/7	8/8
RIJ central line day 1	CL day 2	CL day 3	CL day 4	CL day 5	CL day 6	CL day 7	CL day 8
S/SX				Temp 101F			
Cultures or other source of infection			BCx x 2 at 11:08 – Staph epi 11:20 – CNS				

Infection window period

If the lab identifies one culture at the species level and identifies the companion culture at the genus level, as in the example above, these are considered matching organisms.

If both culture results are identified at the species level, the organisms must match.

Example:

- Staph epi and Staph similans - both are coag negative Staph organisms; but, do not match at the species level. Blood cultures, with only these organisms identified, would not meet NHSN criteria for LCBI.

CLABSI Criterion 3

- ❖ Patient ≤ 1 year of age has at least one of the following s/sx: fever ($>38^{\circ}/100.4^{\circ}$), hypothermia ($<36^{\circ}/96.8^{\circ}$), apnea, or bradycardia

AND

- ❖ Organism(s) identified from blood is not related to an infection at another site

AND

- ❖ The same NHSN common commensal is identified from two or more blood specimens drawn on separate occasions.

AND

- ❖ A central line was in place >2 calendar days on the date of event

- CLABSIs will not be reported for a blood specimen identifying Group B Streptococcus during the first 6 days of life. A BSI RIT will be set, but no central line association will be made.



NEW in
2017

Mucosal Barrier Injury LCBI Infection (MBI-LCBI)

Patient meets criteria for:

LCBI 1 with ONLY intestinal organisms from the MBI-LCBI organisms list

OR

LCBI 2 or LCBI 3 with only viridans group streptococci but no other organism

AND

Patient meet at least one of the following:

1. Is an allogeneic hematopoietic stem cell recipient within the past year with one of the following documented during same hospitalization as positive blood specimens
 - ▶ Grade III or IV gastrointestinal graft versus host disease
 - ▶ ≥ 1 liter diarrhea in a 24 hour period (or ≥ 20 ml/kg in a 24-hour period for patients < 18 years of age) with onset on or within 7 calendar days before the date the first positive blood specimen was collected.
2. Is neutropenic, defined as at least 2 separate days with values of absolute neutrophil count or total WBC < 500 cells/mm³ within a 7-day time period which includes the date the positive blood specimen was collected (day 1), the 3 calendar days before and the 3 calendar days after.



**2018
Anticipated
Updates**

Additional patient conditions which will not be considered CLABSI; specific documentation will be required

- Epidermylosis bullosa - inherited connective tissue disorder; patient is vulnerable to infections secondary to blistering of the skin
- Munchhausen by Proxy

Additional organisms excluded from cause of CLABSI

- Enterohemorrhagic E. coli

Catheter-Associated Urinary Tract Infections (CAUTIs)

Definitions

Indwelling catheter - a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a drainage bag.

- ❖ Condom or in-and-out catheters are not included; neither are nephrostomy tubes, ileoconduits, or suprapubic catheters unless a Foley catheter is also in place.

Catheter-associated UTI (CAUTI) - A UTI where an indwelling urinary catheter was in place on the date of event or the day before and was in place for >2 calendar days.

- ❖ If the catheter was in place for >2days then removed, the date of the event must be the day of removal or the next day for the UTI to be catheter associated.

CAUTI Criterion 1a

Must meet all three:

1. Patient had an indwelling urinary catheter that had been in place for >2 days on the date of event AND was either present for any portion of the day on the date of event or removed the day before the date of event
2. Patient has at least one of the following s/sx:
 - Fever ($>38^{\circ}/100.4^{\circ}$)
 - Suprapubic tenderness*
 - Costovertebral angle pain or tenderness*
 - Urinary urgency**
 - Urinary frequency**
 - Dysuria**
3. Patient has a urine culture with no more than 2 species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the UTI criterion must occur during the infection window period.

*with no other recognized cause

**These symptoms cannot be used when catheter is in place because the catheter can cause the patient to have these complaints.

CAUTI Criterion 2

Must meet all three:

1. Patient is ≤ 1 year of age, had an indwelling urinary catheter that had been in place for >2 days on the date of event AND was either present for any portion of the day on the date of event or removed the day before the date of event
2. Patient has at least on of the following s/sx:
 - Fever ($>38^{\circ}/100.4^{\circ}$)
 - Hypothermia ($>36^{\circ}/96.8^{\circ}$)
 - Apnea*
 - Bradycardia*
 - Lethargy*
 - Vomiting*
 - Suprapubic tenderness*
3. Patient has a urine culture with no more that 2 species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the UTI criterion must occur during the infection window period.

*with no other recognized cause

CAUTI - ABUTI Criterion

Asymptomatic Bacteremic UTI (ABUTI)

1. Patient had an indwelling urinary catheter that had been in place for >2 days on the date of event AND was either present for any portion of the day on the date of event or removed the day before the date of event
2. Patient has no s/sx of SUTI 1 or 2
3. Patient has a urine culture with no more than 2 species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml.
4. Patient has organism identified from blood specimen with at least one matching bacterium to the bacterium identified in the urine specimen, or meets LCBI criterion 2 (without fever) and matching common commensal in the urine. All elements of the ABUTI criterion must occur during the infection window period.

CAUTI

Excluded pathogens which cannot be used to meet CAUTI criteria:

- ❖ Mixed flora
- ❖ Candida species or yeast not otherwise specified
- ❖ Mold
- ❖ Dimorphic fungi
- ❖ Parasites

CAUTI

Notes

- ❖ Fever is a nonspecific symptom of infection; it cannot be excluded from CAUTI determination because it has been clinically deemed to be secondary to another infection.
- ❖ Supra-pubic tenderness by palpation (with empty bladder) or by subjective complaint, lower abdominal pain, bladder or pelvic discomfort are acceptable as part of the CAUTI criterion.
- ❖ Left or right lower back or flank pain are examples of symptoms that can be used as costovertebral angle pain or tenderness.

Ventilator Associated Events (VAEs)

- ❖ The VAE surveillance definition was implemented in January 2013. Several modifications have been implemented since 2013.
- ❖ Based on objective, streamlined, and potentially automatable criteria that identify a broad range of conditions and complications occurring in mechanically-ventilated adult patients.
- ❖ Three definition tiers:
 - Ventilator-Associated Condition (VAC)
 - Infection-related Ventilator-Associated Complication (IVAC)
 - Possible Ventilator-Associated Pneumonia (PVAP)
- ❖ VAEs are identified by using a combination of objective criteria:
 - deterioration in respiratory status after a period of stability or improvement on the ventilator,
 - evidence of infection or inflammation, and
 - laboratory evidence of respiratory infection

Ventilator Associated Events (VAEs)

- ❖ Patients must be mechanically ventilated for at least 4 calendar days to fulfill VAE criteria (where the day of intubation and initiation of mechanical ventilation is day 1)
- ❖ The earliest date of event for VAE (the date of onset of worsening oxygenation) is day 3 of mechanical ventilation.
- ❖ Patients on high frequency ventilation or extracorporeal life support are EXCLUDED from VAE surveillance
- ❖ Excluded organisms/pathogens for IVAC and PVAP
 - ❑ Normal or mixed respiratory flora, normal or mixed oral flora
 - ❑ *Candida* species or yeast not otherwise specified
 - ❑ Coagulase-negative *Staphylococcus* species
 - ❑ *Enterococcus* species, unless identified from lung tissue or pleural fluid specimens
 - ❑ *Blastomyces*, *Histoplasma*, *Coccidioides*, *Paracoccidioides*, *Cryptococcus* and *Pneumocystis*.
 - These organisms rarely, if at all, the cause healthcare-associated infections

Ventilator Associated Events (VAEs)

Definitions

Date of event - the first calendar day in which the daily minimum PEEP or FiO₂ increases above the thresholds outlined in the VAE definition algorithm

The baseline period of stability or improvement on the ventilator - ≥ 2 calendar days of stable or decreasing daily minimum FiO₂ or PEEP values immediately preceding the first day of increased daily minimum PEEP or FiO₂

The minimum daily PEEP or FiO₂ - the lowest setting during a calendar day that was maintained for at least 1 hour

❖ PEEP values between 0 cmH₂O and 5 cmH₂O will be considered equivalent.

Indicators of worsening oxygenation:

1. Increase in daily minimum* FiO₂ of ≥ 0.20 (20 points) over the daily minimum FiO₂ in the baseline period, sustained for ≥ 2 calendar days.
2. Increase in daily minimum* PEEP values of ≥ 3 cmH₂O over the daily minimum PEEP in the baseline period†, sustained for ≥ 2 calendar days.

Ventilator Associated Events (VAEs)

Definitions (cont.)

VAE Window Period - This is the period of days around the event date in which other VAE criteria must be met.

- ❖ It is usually a 5-day period and includes the 2 days before, the day of, and the 2 days after the VAE event date
- ❖ Exception - if the event date corresponds to day 3 or 4 of mechanical ventilation, the window period may only be 3 or 4 days, instead of 5.
- ❖ VAEs are defined by a 14-day period. The date of event is day 1. A new VAE cannot be identified or reported until this 14-day period has elapsed.

Ventilator Associated Events (VAEs)

Definitions (cont.)

New antimicrobial agent - any antimicrobial agent eligible for IVAC and PVAP criteria (NHSN manual 10-23 and 10-24) that is initiated on or after the third calendar day of mechanical ventilation AND within the VAE Window Period.

Qualifying Antimicrobial Day (QAD) - A day on which the patient was administered a new antimicrobial agent within the VAE Window Period. Four consecutive QADs are needed to meet the IVAC antimicrobial criterion.

Purulent Respiratory Secretions - secretions from the lungs, bronchi, or trachea that contain >25 neutrophils and <10 squamous epithelial cells per low power field [lpf, x100].

- ❖ Table 2: Instructions for using the purulent respiratory secretions criterion, based on laboratory reporting of respiratory secretion direct examination results. (NHSN Patient Safety Manual, 10-13)

Ventilator Associated Events (VAEs)

Ventilator-Associated Condition (VAC)

After a period of stability or improvement on the ventilator, the patient has at least one of the following indicators of worsening oxygenation:

1. Increase in daily minimum FiO₂ of ≥ 0.20 (20 points) over the daily minimum FiO₂ in the baseline period, sustained for ≥ 2 calendar days.

OR

2. Increase in daily minimum PEEP values of ≥ 3 cmH₂O over the daily minimum PEEP in the baseline period, sustained for ≥ 2 calendar days.

Ventilator Associated Events (VAEs)

Infection-related Ventilator-Associated Complication (IVAC)

On or after calendar day 3 of mechanical ventilation and within 2 calendar days before or after the onset of worsening oxygenation, the patient meets both of the following criteria:

1) Temperature $> 38^{\circ}\text{C}$ or $< 36^{\circ}\text{C}$, OR white blood cell count $\geq 12,000$ cells/mm³ or $\leq 4,000$ cells/mm³.

AND

2) A new antimicrobial agent(s) is started, and is continued for ≥ 4 calendar days.

Ventilator Associated Events (VAEs)

Possible Ventilator-Associated Pneumonia (PVAP)

On or after calendar day 3 of mechanical ventilation and within 2 calendar days before or after the onset of worsening oxygenation, ONE of the following criteria is met:

1. Criterion 1: Positive culture meeting specific quantitative or semi-quantitative threshold without requirement for purulent respiratory secretions.
2. Criterion 2: Purulent respiratory secretions AND identification of organisms NOT meeting the quantitative or semi-quantitative thresholds
3. Criterion 3: Organisms identified from pleural fluid specimen, positive lung histopathology, and positive diagnostic test for *Legionella* species or selected respiratory viruses.

**2018
Anticipated
Updates**

VAE identified in a patient on airway pressure release ventilation (APRV) or related modes of mechanical ventilation

- Optional requirement to indicate as such on the VAE Form
- Optional to collect APRV days as a denominator

Event Information

Event Type: VAE - Ventilator-Associated Event
 Date of Event: [] [] [] [] [] []
 Post procedure: []
 MERO Infection Surveillance: []
 Location: []
 Date Admitted to Facility: [] [] [] [] [] []

Risk Factors

Location of Mechanical Ventilation: []
 Date Mechanical Ventilation Initiated: [] [] [] [] [] []
 APRV: []

Event Details

Specific Event: [] Possible Ventilator-Associated Pneumonia

Specify Criteria Used *

STEP 1:VAC (z: 1 Required)

Daily min FIO₂ increases \geq 0.20 (20 points) for \geq 2 days*
* after 2+ days of stable or decreasing daily minimum values

Daily min PEEP increase \geq 5 on H₂O for

STEP 2:VAC

Temperature \geq 38°C or \leq 36°C

OR

White blood cell count \geq 12,000 or \leq 4,000

A new antibiotic agent(s) is started, and is continued for \geq 4 days

STEP 3:VAP

Criterion #1: Positive culture of one of the following specimens, meeting quantitative or semi-quantitative thresholds as outlined in the protocol, with requirement for purulent respiratory secretions: *

Endotracheal aspirate

Report No Events

Total Patient Days *	685
Central Line Days *	125
Urinary Catheter Days *	151
Ventilator Days *	51
APRV Days *	25
Episodes of Mechanical Ventilation:	10

CLABSI:

CAP:

PedVAP:

Optional to provide
* will be removed

Ventilator Associated Events (VAEs)

Resources

Table 2: Instructions for using the purulent respiratory secretions criterion, based on laboratory reporting of respiratory secretion direct examination results, NHSN Patient Safety Manual, 10-13

Table 3: Threshold values for cultured specimens used in the PVAP definition, NHSN Patient Safety Manual, 10-16

VAE algorithm

- https://www.cdc.gov/nhsn/pdfs/pscmanual/10-vae_final.pdf

VAE calculator

- <https://www.cdc.gov/nhsn/vae-calculator/index.html>

VAE FAQs

- <https://www.cdc.gov/nhsn/pdfs/faqs/psc/faqs-vae.pdf>

VAE worksheet

- https://www.cdc.gov/nhsn/pdfs/vae/VAE_DataCollectionWorksheet_FINAL.docx

Laboratory Identified (LabID) Events

Laboratory-Identified (LabID) Event - All non-duplicate MDRO isolates from any specimen source and unique blood source MDRO isolates.

- ❖ Reported from all facility-wide inpatient (FacWideIn) locations
- ❖ Reported from all facility-wide outpatient locations (i.e. ED and Obs locations)
- ❖ All LabID Events must be reported by location
- ❖ A LabID Event calculator is available on the NHSN website to help with data entry decision making around the 14-day rule.

Community-Onset (CO) - LabID Event specimen collected in an outpatient location or an inpatient location ≤ 3 days after admission to the facility (i.e., days 1, 2, or 3 of admission).

Healthcare Facility-Onset (HO) - LabID Event specimen collected >3 days after admission to the facility (i.e., on or after day 4).

MRSA Bacteremia LabID Event

MRSA Unique Blood Source - An MRSA isolate from blood in a patient with no prior positive blood culture for the same location in ≤ 2 weeks, even across calendar months and different facility admissions.

- ❖ There should be 14 days with no positive MRSA blood culture result for the patient and location before another MRSA Blood LabID Event is entered into NHSN for the patient and location.
- ❖ The day of the specimen collection is day 1.
- ❖ A patient has a positive MRSA blood isolate while in the emergency department (ED). The patient is admitted to ICU; three days later, he has a second positive MRSA blood specimen. Both specimens would be entered into NHSN because the specimen is a unique blood source for each area. But, the second specimen will not be included in FacWideIn analysis reports.

MRSA Bacteremia LabID Event Example

Hosp day	Specimen	Location
1	+MRSA BCx	Drawn in ED - pt adm to ICU
2		ICU
3		ICU
4	+MRSA BCx	ICU
5	+MRSA BCx	ICU
6		ICU - Tele
7		Tele
8		Tele
9		
10		

Report LabID event for ED

Report LabID event for ICU

Do not report - this represents a duplicate blood source for ICU

Clostridium difficile LabID Event

CDI-positive laboratory assay - A positive laboratory test result for *C. difficile* toxin A and/or B (PCR and/or toxin assays), tested on an unformed stool specimen (must conform to the container)

OR

A toxin-producing *C. difficile* organism detected by culture or other laboratory means performed on an unformed stool sample (must conform to the container).

Duplicate *C. difficile*-positive test - Any *C. difficile* toxin-positive laboratory result from the same patient and location, following a previous *C. difficile* toxin-positive laboratory result within the past 14 days (even across calendar months and readmissions to the same facility).

- There should be 14 days with no *C. difficile* toxin-positive laboratory result for the patient and location before another *C. difficile* LabID Event is entered into NHSN for the patient and location. The date of specimen collection is considered Day 1.

Clostridium difficile LabID Event

CDI Laboratory-Identified (LabID) Event: All non-duplicate *C. difficile* toxin-positive laboratory results. Even if reporting at the FacWide level, all reporting must follow rules by location for reporting.

- CDI LabID event surveillance is not performed in NICU, SCN, or well-baby nurseries.

Incident CDI LabID Event - Any CDI LabID Event from a specimen obtained >56 days (8 weeks) after the most recent CDI LabID Event (or with no previous CDI LabID Event documented) for that patient.

Recurrent CDI LabID Event - Any CDI LabID Event from a specimen obtained >14 days (2 weeks) and ≤ 56 days (8 weeks) after the most recent CDI LabID Event for that patient.

- Recurrent assays are not included in your facility SIR.

Clostridium difficile LabID Event

- ❖ Community-Onset (CO) - LabID Event collected in an outpatient location or an inpatient location ≤ 3 days after admission to the facility (i.e., days 1, 2, or 3 of admission).
 - ❖ Community-Onset Healthcare Facility-Associated (CO-HCFA) - CO LabID Event collected from a patient who was discharged from the facility ≤ 4 weeks prior to current date of stool specimen collection.
 - ❖ Data from outpatient locations (e.g., outpatient encounters) are not included in this definition.
 - ❖ Healthcare Facility-Onset (HO) - LabID Event collected > 3 days after admission to the facility (i.e., on or after day 4).
- ▶ <https://www.cdc.gov/nhsn/labid-calculator/index.html>

CDI LabID Event Example

Hosp day	Specimen	Location
1		ED - pt adm to ICU
2		ICU
3		ICU
4		ICU - MS
5	+Cdiff PCR	MS
6		MS
7		MS
8		MS
9		MS
10		

- Healthcare Onset
- Report LabID event for MS
- Do not report another CDI labID event for MS location until after hospital day 18

Surgical Site Infections (SSIs)

SSI surveillance monitoring

- active, patient-based, prospective surveillance.
- Review of medical records, surgery records, and/or clinic patient records
- Admission, readmission, ED, and OR logs
- Patient charts for signs and symptoms of SSI
- Lab, X-ray, other diagnostic test reports
- Nurses and physician notes
- Visit the ICU and wards - talk to primary care staff
- Surgeon surveys by mail or telephone
- Patient surveys by mail or telephone (though patients may have a difficult time assessing their infections).

Surgical Site Infections (SSIs)

- An SSI will be associated with a particular NHSN operative procedure and the facility in which that procedure was performed.
- Any infections associated with procedures not included in one of the mapped NHSN Operative Procedure Categories are not considered an NHSN surgical site infection, although it may be a healthcare-associated infection.
- An NHSN Operative Procedure is a procedure:
 - that is included in the ICD-10-PCS or CPT NHSN operative procedure code mapping, *And*
 - takes place during an operation where at least one incision is made through the skin or mucous membrane, *Or*
 - reoperation via an incision that was left open during a prior operative procedure, *And*
 - takes place in an operating room, C-section room, interventional radiology room, or a cardiac catheterization lab.

Operative Procedure Code Update

- A list of updated ICD-10 operative procedure codes were sent out earlier this year - “2017 Compendium of Code Corrections”
- Can be found on the Supporting Materials section on the SSI webpage.

(CAUTI)	<p>Supporting Materials</p> <h3>2017 Operative Procedure Code Documents</h3> <p>The documents listed below should be used for procedures performed in 2017.</p> <ul style="list-style-type: none">• Update! ICD-10-PCS Procedure Code Mapping to NHSN Operative Procedure Codes [XLSX - 611K]• Update! Current Procedural Terminology (CPT) Procedure Code Mapping to NHSN Operative Procedure Codes [XLSX - 313K]• Additional Guidance for use with NHSN Operative Procedure Codes<ul style="list-style-type: none">◦ Update! ICD-10-PCS & CPT Codes – Guidance for HPRO & KPRO Procedure Details [XLSX - 46K] <p>This guidance document may be used for completing the NHSN procedure details for HPRO – hip arthroplasty and/or KPRO – Knee arthroplasty operative procedures.</p>
Surveillance for C. difficile, MRSA, and other Drug-resistant Infections	
Surveillance for BSI (CLABSI)	
Surveillance for CLIP	
Surveillance for SSI Events	
Surveillance for VAE	
Surveillance for PNEU (pedVAP)	

Surveillance for Healthcare Personnel Exposure
--

30-day Surveillance

Code	Operative Procedure	Code	Operative Procedure
AAA	Abdominal aortic aneurysm repair	LAM	Laminectomy
AMP	Limb amputation	LTP	Liver transplant
APPY	Appendix surgery	NECK	Neck surgery
AVSD	Shunt for dialysis	NEPH	Kidney surgery
BILI	Bile duct, liver or pancreatic surgery	OVRY	Ovarian surgery
CEA	Carotid endarterectomy	PRST	Prostate surgery
CHOL	Gallbladder surgery	REC	Rectal surgery
COLO	Colon surgery	SB	Small bowel surgery
CSEC	Cesarean section	SPLE	Spleen surgery
GAST	Gastric surgery	THOR	Thoracic surgery
HTP	Heart transplant	THYR	Thyroid and/or parathyroid surgery
HYST	Abdominal hysterectomy	VHYS	Vaginal hysterectomy
KTP	Kidney transplant	XLAP	Exploratory Laparotomy

- ❖ Superficial SSIs are only followed for a 30-day period regardless of the procedure type
- ❖ Secondary incisions, e.g. endovascular vein harvest sites are only followed for a 30-day period regardless of the surveillance period for the primary incision.

90-day Surveillance

Code	Operative Procedure
BRST	Breast surgery
CARD	Cardiac surgery
CBGB	Coronary artery bypass graft with both chest and donor site incisions
CBGC	Coronary artery bypass graft with chest incision only
CRAN	Craniotomy
FUSN	Spinal fusion
FX	Open reduction of fracture
HER	Herniorrhaphy
HPRO	Hip prosthesis
KPRO	Knee prosthesis
PACE	Pacemaker surgery
PVBY	Peripheral vascular bypass surgery
VSHN	Ventricular shunt

Surgical Site Infections (SSIs)

- Date of event (DOE) - For an SSI is the date when the first element used to meet the SSI infection criterion occurs for the first time during the SSI surveillance period.
 - The date of event must fall within the SSI surveillance period to meet SSI criteria.
- Secondary BSI Attribution Period for SSI - a 17-day period that includes the date of event, 3 days prior, and 13 days after.
- Aseptically obtained culture - Obtained in a manner to prevent introduction of organisms from the surrounding tissues into the specimen being collected.
 - Specific procedures for specimen collection and transport is institution dependent.
 - Feedback I have received from NHSN - if the facility has a wound culturing policy, one must assume it was properly collected unless there is evidence otherwise.

Superficial Incisional SSI

- ❖ Date of event for infection occurs within 30 days after any NHSN operative procedure (where day 1 = the procedure date)

AND

- ❖ Involves only skin and subcutaneous tissue of the incision

AND

Superficial Incisional SSI

- ❖ Patient has at least one of the following:
 - a. purulent drainage from the superficial incision.
 - b. organisms identified from an aseptically-obtained specimen from the superficial incision or subcutaneous tissue by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment
 - c. superficial incision that is deliberately opened by a surgeon, attending physician** or other designee and culture or non-culture based testing is not performed
AND
patient has at least one of the following signs or symptoms:
 - pain or tenderness, localized swelling, erythema, or heat
 - d. diagnosis of a superficial incisional SSI by the surgeon or attending physician** or other designee

Superficial Incisional SSI

The following do not qualify as criteria for meeting the NHSN definition of superficial SSI:

- Diagnosis/treatment of cellulitis (redness/warmth/swelling), by itself, does not meet criterion “d” for superficial incisional SSI.
- Conversely, an incision that is draining or that has organisms identified by culture or non-culture based testing is not considered a cellulitis.
- A stitch abscess alone (minimal inflammation and discharge confined to the points of suture penetration).
- A localized stab wound or pin site infection- Such an infection might be considered either a skin (SKIN) or soft tissue (ST) infection, depending on its depth, but not an SSI Note: A laparoscopic trocar site for an NHSN operative procedure is not considered a stab wound.

Deep Incisional SSI

- ❖ The date of event for infection occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date)

AND

- ❖ involves deep soft tissues of the incision (e.g., fascial and muscle layers)

AND

Deep Incisional SSI

- ❖ patient has at least one of the following:
 - a. purulent drainage from the deep incision
 - b. a deep incision that spontaneously dehisces, or is deliberately opened or aspirated by a surgeon, attending physician** or other designee and organism is identified by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment or culture or is not performed
- AND
- patient has at least one of the following signs or symptoms: fever ($>38^{\circ}\text{C}$); localized pain or tenderness.
- ▶ A culture or non-culture based test that has a negative finding does not meet this criterion.
- c. an abscess or other evidence of infection involving the deep incision that is detected on gross anatomical or histopathologic exam, or imaging test

Organ/Space SSI

- ❖ Date of event for infection occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date)

AND

- ❖ Infection involves any part of the body deeper than the fascial/muscle layers, that is opened or manipulated during the operative procedure

AND

Organ/Space SSI

- ❖ Patient has at least one of the following:
 - a. purulent drainage from a drain that is placed into the organ/space (e.g., closed suction drainage system, open drain, T-tube drain, CT guided drainage)
 - b. organisms are identified from an aseptically-obtained fluid or tissue in the organ/space by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment
 - c. an abscess or other evidence of infection involving the organ/space that is detected on gross anatomical or histopathologic exam, or imaging test evidence suggestive of infection.

AND

- ❖ Meets at least one criterion for a specific organ/space infection site
 - Can be found in Chapter 17 of the NHSN Patient Safety Manual

SSI specific event types attributed to each NHSN procedure category

COLO - Colon surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
HYST - Abdominal hysterectomy	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Other infection of the male or female reproductive tract SIP - Superficial Incisional Primary VCUF - Vaginal cuff infection

Organ/Space Site Specific Definitions

- GIT-Gastrointestinal tract infection (esophagus, stomach, small and large bowel, and rectum) excluding gastroenteritis, appendicitis, and *C. difficile* infection must meet at least one of the following criteria:
 1. Patient has an abscess or other evidence of infection on gross anatomic or histopathologic exam of gastrointestinal tract.

Organ/Space Site Specific Definitions

2. Patient has at least two of the following signs or symptoms compatible with infection of the organ or tissue involved: fever ($>38.0^{\circ}\text{C}$), nausea*, vomiting*, pain* or tenderness*, odynophagia*, or dysphagia*

And at least one of the following:

- a. organism(s) identified from drainage or tissue obtained during an invasive procedure or from drainage from an aseptically-placed drain
- b. organism(s) seen on Gram stain or fungal elements seen on KOH stain or multinucleated giant cells seen on microscopic examination of drainage or tissue obtained during an invasive procedure or from drainage from an aseptically-placed drain
- c. organism(s) identified from blood and must contain at least one MBI organism

AND

imaging test evidence suggestive of gastrointestinal infection, which if uncertain, is supported by clinical correlation (i.e., physician documentation of antimicrobial treatment for gastrointestinal tract infection).

- d. imaging test evidence suggestive of infection (e.g., endoscopic exam, MRI, CT scan), which if uncertain, is supported by clinical correlation (i.e., physician documentation of antimicrobial treatment for gastrointestinal tract infection).



2017 updated
2C-expanded MBI
organism list

GI - GIT 1 Anticipated 2018 Protocol Update

- GIT-Gastrointestinal tract infection (esophagus, stomach, small and large bowel, and rectum) excluding gastroenteritis, appendicitis, and C. difficile infection
 - Anticipated update: GIT criterion 1 to allow blood as an element when there is evidence of gastrointestinal tract infection.
 - 1. Patient has one of the following:
 - a. an abscess or other evidence of gastrointestinal tract infection on gross anatomic or histopathologic exam.
 - b. abscess or other evidence of gastrointestinal tract infection on gross anatomic or histopathologic exam
- AND
- organism(s) identified from blood which must contain at least one MBI organism.



2018
Anticipated
Updates

Organ/Space Site Specific Definitions

IAB-Intraabdominal infection, not specified elsewhere

➤ includes gallbladder, bile ducts, liver (excluding viral hepatitis), spleen, pancreas, peritoneum, subphrenic or subdiaphragmatic space, or other intraabdominal tissue or area not specified elsewhere and must meet one of the following:

1. Patient has organism(s) identified from an abscess or from purulent material from intraabdominal space
2. Patient has at least one of the following:
 - a. abscess or other evidence of intraabdominal infection on gross anatomic or histopathologic exam
 - b. abscess or other evidence of intraabdominal infection on gross anatomic or histopathologic exam

AND

organism(s) identified from blood which must contain at least one MBI organism.



2017 -
expanded MBI
organism list

Organ/Space Site Specific Definitions

IAB infection

3. Patient has at least two of the following: fever ($>38.0^{\circ}\text{C}$), nausea*, vomiting*, abdominal pain*, or jaundice* And at least one of the following:
 - a. organism(s) seen on Gram stain or identified from fluid 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)
 - b. organism(s) identified from blood which must contain at least one MBI organism
- AND
- imaging test evidence suggestive of infection, which if uncertain, is supported by clinical correlation (i.e., physician documentation of antimicrobial treatment for intraabdominal infection).

* With no other recognized cause

Surgical Site Infections (SSIs)

OREP- Deep pelvic tissue infection or other infection of the male or female reproductive tract (epididymis, testes, prostate, vagina, ovaries, uterus, chorioamnionitis, excluding vaginitis, endometritis or vaginal cuff infections)

- Must meet at least one of the following criteria:
 1. Patient has organism(s) identified from tissue or fluid from affected site (excludes urine and vaginal swabs)
 2. Patient has an abscess or other evidence of infection of affected site on gross anatomic or histopathologic exam.

Organ/Space Site Specific Definitions

OREP infections

3. Patient has suspected infection of one of the listed OREP sites and two of the following localized signs or symptoms: fever ($>38.0^{\circ}\text{C}$), nausea*, vomiting*, pain or tenderness*, or dysuria*

And at least one of the following:

- a. organism(s) identified from blood
- b. physician initiates antimicrobial therapy within two days of onset or worsening of symptoms

* With no other recognized cause

Organ/Space Site Specific Definitions

VCUF-Vaginal cuff infection

- Must meet at least one of the following criteria:
 1. Post hysterectomy patient has purulent drainage from the vaginal cuff on gross anatomic exam.
 2. Post hysterectomy patient has an abscess or other evidence of infection at the vaginal cuff on gross anatomic exam.
 3. Post hysterectomy patient has organism(s) identified from fluid or tissue obtained from the vaginal cuff.

Surgical Site Infections (SSIs)

Present at the time of surgery (PATOS) - denotes that there is evidence of an infection or abscess at the start of or during the index surgical procedure.

- does not apply if there is a period of wellness between the time of a preoperative condition and surgery
- The evidence of infection or abscess must be noted/documented intraoperatively in an operative note or report of surgery
- applies to the depth of SSI that is being attributed to the procedure
- The use of the ending “itis” in an operative note/report does not necessarily meet PATOS, as it may reflect inflammation which is not infectious in nature (e.g., diverticulitis, peritonitis, and appendicitis)

Surgical Site Infections (SSIs)

Present at the time of Surgery (PATOS)

- a positive culture/path report without surgical documentation of infection is not PATOS
- colon perforation, necrosis, gangrene, fecal spillage, nicked bowel during procedure, or a note of inflammation without specific mention of infection does not meet the PATOS definition
- Fresh trauma resulting in a contaminated case does not necessarily meet the PATOS requirement.
- PATOS can be met when an abscess is noted, there is mention of infection in the OR note, purulence or pus is noted, or “feculent peritonitis” is noted, etc. An infected appendix that has ruptured will meet PATOS definition if the patient has a subsequent intraabdominal organ space SSI.

Surgical Site Infections (SSIs)

- The type of SSI (superficial incisional, deep incisional, or organ/space) reported should reflect the deepest tissue layer involved in the infection during the surveillance period.
- If more than one NHSN procedure was performed on different dates prior to an infection, attribute the SSI to the last operative procedure that was performed prior to the infection date, unless there is evidence that the infection was associated with a different operation.
- If multiple primary incision sites (e.g. trocar sites) of the same NHSN operative procedure become infected, only report as a single SSI, and assign the type of SSI that represents the deepest tissue level involved at any of the infected sites.

Surgical Site Infections (SSIs)

- The surveillance period for all secondary sites is 30 days, regardless of the required deep incisional or organ/space SSI surveillance period for the primary incision site
- If during the postoperative period the surgical site has an invasive manipulation/accession for diagnostic or therapeutic purposes (e.g., needle aspiration, accession of ventricular shunts, accession of breast expanders) and there is no evidence of an infection at that time, if an SSI develops following this manipulation/accession, the infection is not attributed to the operation.
- If more than one NHSN operative procedure category was performed through a single incision/laparoscopic sites during a single trip to the operating room, attribute the SSI to the procedure that is thought to be associated with the infection. If it is not clear, as is often the case when the infection is an incisional SSI, use the NHSN Principal Operative Procedure Category Selection Lists (Table 4) to select the operative procedure to which the SSI should be attributed.

SSIs - NHSN Operative Procedure Categories

Table 4. NHSN Principal Operative Procedure Category Selection Lists
 (The categories with the highest risk of SSI are listed before those with lower risks).

Priority	Code	Abdominal Operations
1	LTP	Liver transplant
2	COLO	Colon surgery
3	BILI	Bile duct, liver or pancreatic surgery
4	SB	Small bowel surgery
5	REC	Rectal surgery
6	KTP	Kidney transplant
7	GAST	Gastric surgery
8	AAA	Abdominal aortic aneurysm repair
9	HYST	Abdominal hysterectomy
10	CSEC	Cesarean section
11	XLAP	Laparotomy
12	APPY	Appendix surgery
13	HER	Herniorrhaphy
14	NEPH	Kidney surgery
15	VHYS	Vaginal Hysterectomy
16	SPLE	Spleen surgery
17	CHOL	Gall bladder surgery
18	OVRV	Ovarian surgery
Priority	Code	Thoracic Operations
1	HTP	Heart transplant
2	CBGB	Coronary artery bypass graft with donor incision(s)

References and Resources

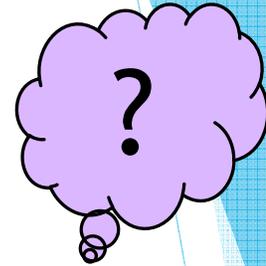
National Healthcare Safety Network (NHSN). (2017). *Patient safety component manual*. Retrieved from https://www.cdc.gov/nhsn/pdfs/pscmanual/pscmanual_current.pdf

National Healthcare Safety Network (NHSN). (2017). *Frequently asked questions: Surgical site infections (SSI)*. Retrieved from <https://www.cdc.gov/nhsn/pdfs/faqs/psc/faqs-ssi.pdf>

National Healthcare Safety Network (NHSN). (2017). *National Healthcare Safety Network member's meeting*. Retrieved from <https://www.cdc.gov/nhsn/pdfs/newsletters/nhsn-members-meeting-2017.pdf>

CDC.gov. (2017). *National healthcare safety network*. Retrieved from <https://www.cdc.gov/nhsn/index.html>

- FAQs
- Event calculators
- Worksheet generators
- Data collection forms
- Protocols
- Training videos



Questions

