The Ins and Outs of SSI Surveillance 2022

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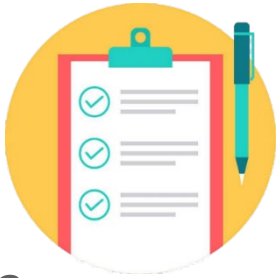
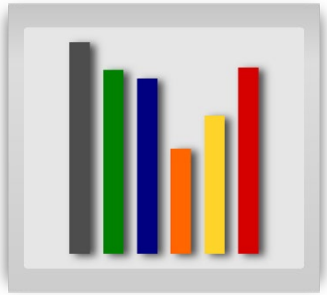
Objectives



- *Set the Stage: Identify the SSI Protocol and Resources to supplement training*
- *Recognize elements necessary for accurate denominator [procedure] and numerator [SSI event] reporting*
- *Review correct application of SSI definitions, key terms, and reporting instructions through case scenarios*

Set the Stage: The SSI Protocol and Resources

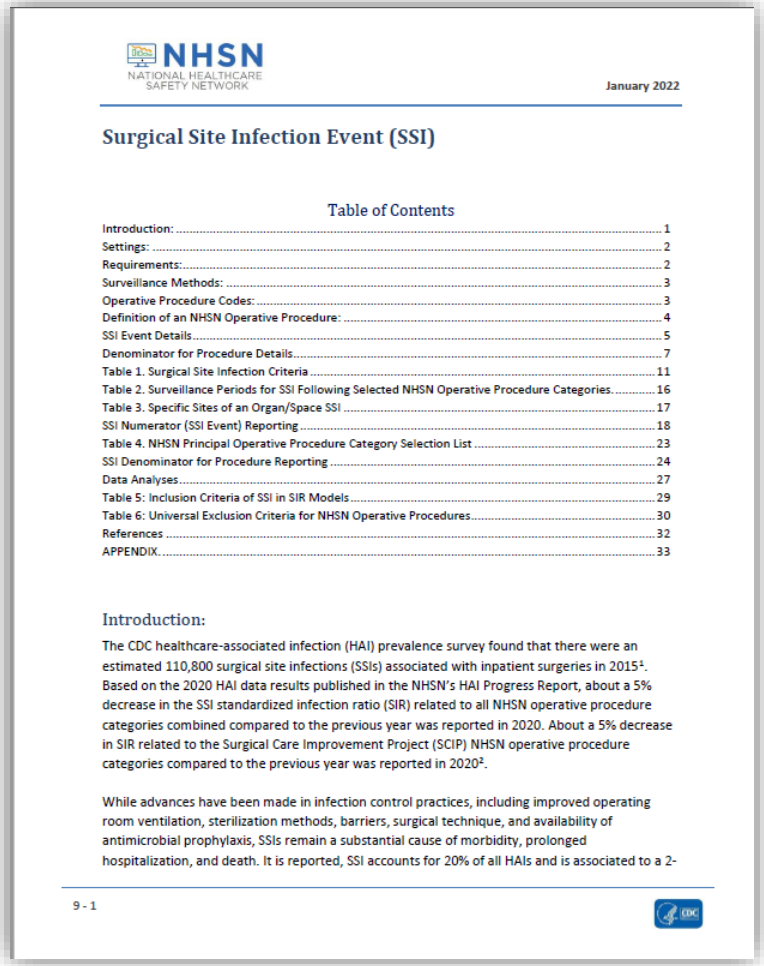
Chapter 9 – The SSI Protocol



- Why Monitor SSI?
  - SSIs are a substantial cause of morbidity and mortality
    - Prolonged hospitalizations
    - Increased costs [most costly HAI type]
  - Surveillance of SSI with feedback of data is important to reduce SSI risk
- Clinical vs. Surveillance
  - NHSN offers standardized criteria that must be applied in the same manner by all who use them in order to be able to use the resulting data for epidemiological purposes

Chapter 9 – The SSI Protocol

- NHSN Patient Safety Component Manual Chapter 9: Surgical Site Infection (SSI) Event
- Settings:
  - Any inpatient facility and/or hospital outpatient procedure department (HOPD) where NHSN operative procedure(s) are performed



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NATIONAL HEALTHCARE SAFETY NETWORK

January 2022

Surgical Site Infection Event (SSI)

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Introduction:

The CDC healthcare-associated infection (HAI) prevalence survey found that there were an estimated 110,800 surgical site infections (SSIs) associated with inpatient surgeries in 2015[1]. Based on the 2020 HAI data results published in the NHSN's HAI Progress Report, about a 5% decrease in the SSI standardized infection ratio (SIR) related to all NHSN operative procedure categories combined compared to the previous year was reported in 2020. About a 5% decrease in SIR related to the Surgical Care Improvement Project (SCIP) NHSN operative procedure categories compared to the previous year was reported in 2020[2].

While advances have been made in infection control practices, including improved operating room ventilation, sterilization methods, barriers, surgical technique, and availability of antimicrobial prophylaxis, SSIs remain a substantial cause of morbidity, prolonged hospitalization, and death. It is reported, SSI accounts for 20% of all HAIs and is associated to a 2-

Reminder: SSI On-Demand Video

Navigating SSI Reporting in NHSN available as an On-demand video

Content covered:

- Surveillance Methods
- Locating SSI Resources on NHSN website
- Reporting Requirements for Monthly Reporting Plan, Numerator and Denominator Data
- Review Alerts and Generating Data Sets in the NHSN application

Key Points for SSI Reporting:

- Monthly Reporting Plan: numerator and denominator data collected for all procedure categories selected in the Monthly Reporting Plan
  - All procedures must be followed for superficial incisional, deep incisional, and organ/space SSI events
  - SSI events are reportable by the facility where the procedure to which it is linked was performed
- The date of the procedure determines the protocol year to use with SSI surveillance
- Those procedures identified by ICD-10-PCS or CPT operative procedure codes as an NHSN operative procedure will begin an SSI surveillance period
  - Only NHSN operative procedures are eligible for SSI attribution
- NHSN does not mandate reporting – facility decides what procedures to monitor

Resources for Surgical Site Infection Event (SSI)

- NHSN Surgical Site Infection (SSI) Events webpage: https://www.cdc.gov/nhsn/psc/ssi/index.html

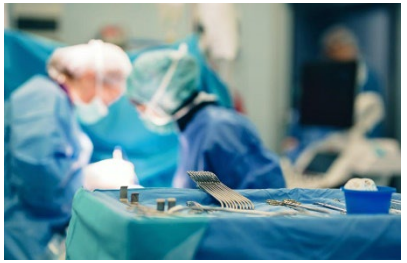
- Patient Safety Component Manual Chapter 9: Surgical Site Infection Event (SSI) Protocol: https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf

- Patient Safety Component Manual Chapter 17: CDC/NHSN Surveillance Definitions for Specific Types of Infections: https://www.cdc.gov/nhsn/pdfs/pscmanual/17pscnosinfdef_current.pdf

- FAQs: Surgical Site Infections (SSI) Events: https://www.cdc.gov/nhsn/faqs/faq-ssi.html

Denominator: The NHSN Operative Procedure

NHSN Operative Procedure



An NHSN operative procedure is a procedure:

- that is included in the ICD-10-PCS and/or CPT NHSN operative procedure code mapping

and

- takes place during an operation where at least one incision (including laparoscopic approach and cranial Burr holes) is made through the skin or mucous membrane, or entry is through an existing incision (such as an incision from a prior operative procedure)

and

- takes place in an operating room [OR], defined as a patient care area that met the Facilities Guidelines Institute's (FGI) or American Institute of Architects' (AIA) criteria for an operating room when it was constructed or renovated. This may include an operating room, C-section room, interventional radiology room, or a cardiac catheterization lab.

NHSN Operative Procedure Codes

- A procedure must meet the definition of an **NHSN Operative Procedure** to be included in SSI surveillance
  - 39 NHSN Operative Procedure Categories
- Operative procedure codes are required to determine the correct NHSN operative procedure category to be reported
  - NHSN uses ICD-10-CM/PCS & CPT operative procedure coding systems
  - Entry of codes into the NHSN application is optional but is recommended

Inpatient operative procedure vs. an outpatient operative procedure

NHSN Inpatient Operative Procedure: An NHSN operative procedure performed on a patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.

NHSN Outpatient Operative Procedure: An NHSN operative procedure performed on a patient whose date of admission to the healthcare facility and date of discharge are the same calendar day.

Accurate Denominator Reporting

Denominator for Procedure Details
Required data fields for denominator entry:

Beginning on page 9-7 of 2022 SSI Protocol

- ASA Physical Status
- Diabetes
- Duration of Operative Procedure
- Emergency Operative Procedure
- General Anesthesia
- Height
- NHSN Inpatient Operative Procedure
- NHSN Outpatient Operative Procedure
- Non-Primary Closure
- Primary Closure
- Scope
- Trauma
- Weight
- Wound Class

Supplemental Fields Required

- **CSEC: Duration of Labor**
- **FUSN: Spinal Level and Approach**
- **HPRO & KPRO: Additional Procedure Details**

Reporting Instructions: Denominator for Procedure

[Beginning on page 9-24 of the 2022 SSI Protocol]

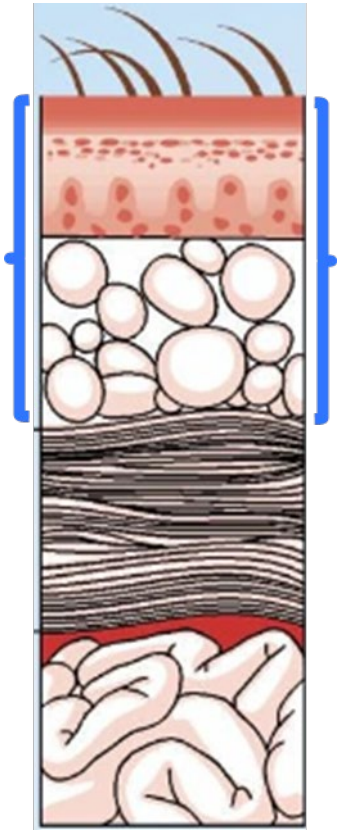
1. Different operative procedure categories performed during same trip to the OR
2. Duration of the operative procedures when more than one category of NHSN operative procedure is performed through the same incision
3. Duration of operative procedures if patient has two different NHSN operative procedures performed via separate incisions on the same trip to the OR
4. Same operative procedure category but different ICD-10-PCS or CPT codes during same trip to the OR

Reporting Instructions: Denominator for Procedure

5. For revision HPRO and KPRO procedures
6. Same NHSN operative procedure category via separate incisions
7. More than one operative procedure through same incision/surgical space within 24 hours
8. Patient expires in the OR
9. HYST or VHYS

Numerator: The SSI Event
Surgical Site Infection Criteria
[Beginning on page 9-11 of the 2022 SSI Protocol]

Superficial Incisional SSI Criteria



Superficial incisional SSI

Must meet the following criteria:

Date of event 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

patient has at least ***one*** of the following:

a. purulent drainage from the superficial incision.

b. organism(s) 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 (for example, not Active Surveillance Culture/Testing (ASC/AST)).

c. superficial incision that is deliberately opened by a surgeon, physician* or physician designee and culture or non-culture based testing of the superficial incision or subcutaneous tissue is not performed

AND

patient has at least one of the following signs or symptoms: localized pain or tenderness; localized swelling; erythema; or heat.

d. diagnosis of a superficial incisional SSI by a physician* or physician designee.

* The term physician for the purpose of application of the NHSN SSI criteria may be interpreted to mean a surgeon, infectious disease physician, emergency physician, other physician on the case, or physician's designee (nurse practitioner or physician's assistant).

Superficial Incisional SSI – Reporting Instructions

Reporting Instructions for Superficial SSI	**<u>The following do not qualify as criteria for meeting the NHSN definition of superficial incisional SSI:</u>** • Diagnosis/treatment of cellulitis (redness/warmth/swelling), by itself, does not meet superficial incisional SSI criterion 'd'. • A stitch abscess alone (minimal inflammation and discharge confined to the points of suture penetration). • A localized stab wound or pin site infection; depending on the depth, these infections might be considered either a skin (SKIN) or soft tissue (ST) infection. **Note:** For an NHSN operative procedure, a laparoscopic trocar site is considered a surgical incision and not a stab wound. If a surgeon uses a laparoscopic trocar site to place a drain at the end of a procedure this is considered a surgical incision.

Two types of Superficial Incisional SSIs: SIP and SIS

Superficial incisional primary (SIP)

A superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions

Example:

CSEC incision or chest incision for CBGB).

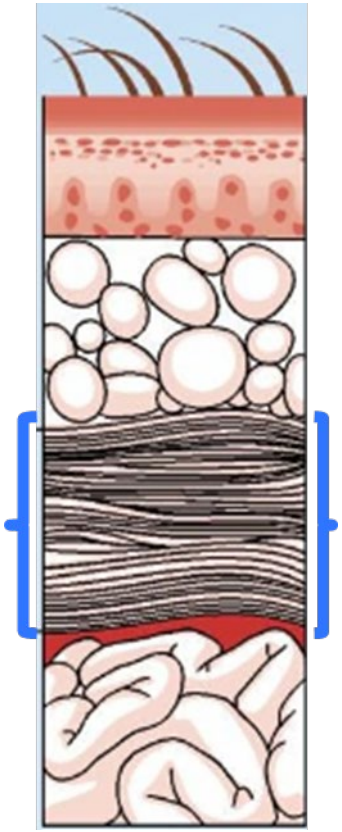
Superficial incisional secondary (SIS)

A superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision

Example:

Saphenous vein harvest incision site for CBGB

Deep Incisional SSI Criteria



Deep incisional SSI
Must meet the following criteria:

The date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

AND

involves deep soft tissues of the incision (for example, fascial and muscle layers)

AND

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, physician* or physician designee

AND

organism(s) identified from the deep soft tissues of the incision by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing (ASC/AST)) or culture or non-culture based microbiologic testing method is not performed. A culture or non-culture based test from the deep soft tissues of the incision that has a negative finding does not meet this criterion.

AND

patient has at least ***one*** of the following signs or symptoms: fever (>38°C); localized pain or tenderness.

c. an abscess or other evidence of infection involving the deep incision that is detected on gross anatomical or histopathologic exam, or imaging test.

* The term physician for the purpose of application of the NHSN SSI criteria may be interpreted to mean a surgeon, infectious disease physician, emergency physician, other physician on the case, or physician's designee (nurse practitioner or physician's assistant).

Two types of Deep Incisional SSIs: DIP and DIS

Deep incisional primary (DIP)

A deep incisional SSI that is identified in a primary incision in a patient that has had an operation with one or more incisions

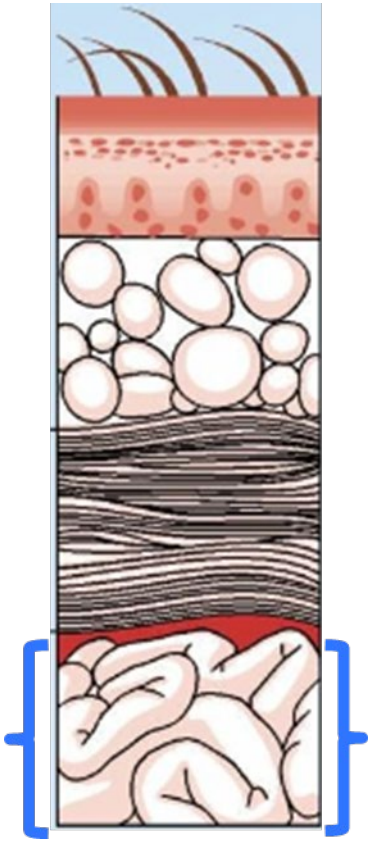
Example:
CSEC incision or chest incision for CBGB).

Deep incisional secondary (DIS)

A deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision

Example:
Saphenous vein harvest incision site for CBGB

Organ/Space SSI Criteria



Organ/Space SSI
Must meet the following criteria:

Date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

AND

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

AND

patient has at least ***one*** of the following:

a. purulent drainage from a drain that is placed into the organ/space (for example, closed suction drainage system, open drain, T-tube drain, CT-guided drainage).
b. organism(s) identified from 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 (for example, not Active Surveillance Culture/Testing (ASC/AST)).
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 listed in Table 3. These criteria are found in the Surveillance Definitions for Specific Types of Infections (Chapter 17)

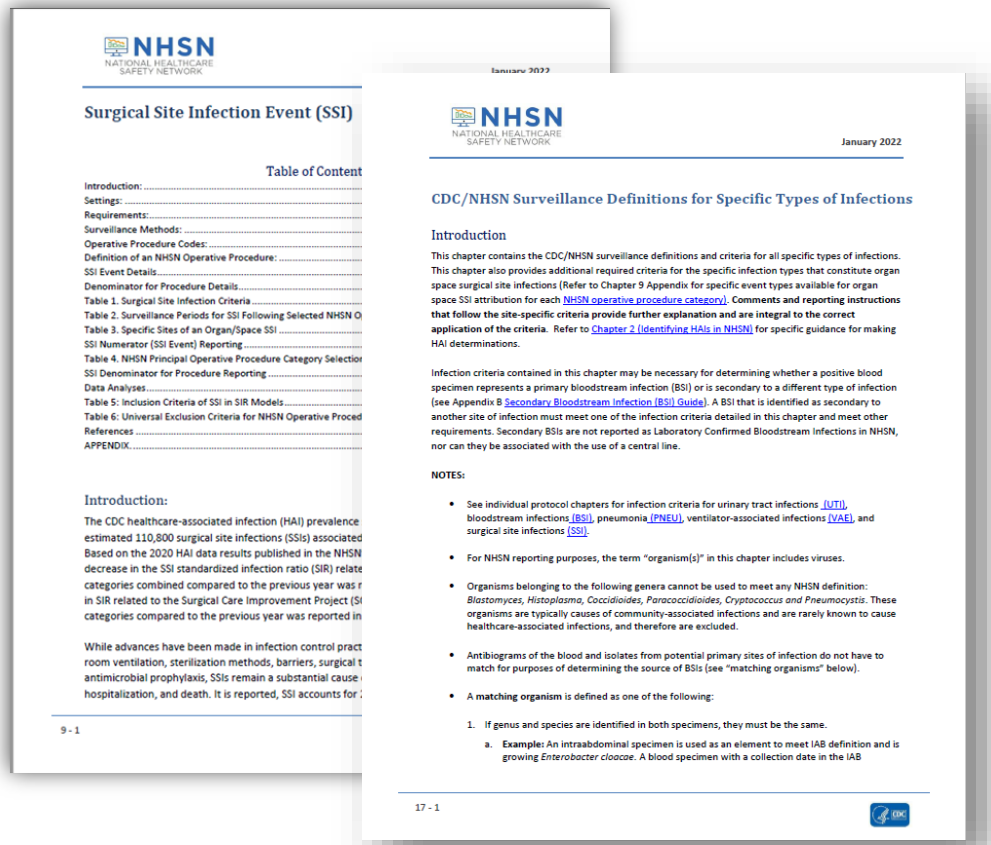
Organ/Space SSI Criteria: Chapter 9 AND Chapter 17

Must meet:

1. Organ/Space criteria [Chapter 9]

AND

2. At least one criterion for a specific organ/space infection site [Chapter 17]



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Surgical Site Infection Event (SSI)

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Introduction:

The CDC healthcare-associated infection (HAI) prevalence
estimated 110,800 surgical site infections (SSIs) associated
Based on the 2020 HAI data results published in the NHSN
decrease in the SSI standardized infection ratio (SIR) relate
categories combined compared to the previous year was
in SIR related to the Surgical Care Improvement Project (S
categories compared to the previous year was reported in

While advances have been made in infection control pract
room ventilation, sterilization methods, barriers, surgical
antimicrobial prophylaxis, SSIs remain a substantial cause
hospitalization, and death. It is reported, SSI accounts for

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January 2022

CDC/NHSN Surveillance Definitions for Specific Types of Infections

Introduction

This chapter contains the CDC/NHSN surveillance definitions and criteria for all specific types of infections. This chapter also provides additional required criteria for the specific infection types that constitute organ space surgical site infections (Refer to Chapter 9 Appendix for specific event types available for organ space SSI attribution for each NHSN operative procedure category). **Comments and reporting instructions that follow the site-specific criteria provide further explanation and are integral to the correct application of the criteria.** Refer to Chapter 2 (Identifying HAIs in NHSN) for specific guidance for making HAI determinations.

Infection criteria contained in this chapter may be necessary for determining whether a positive blood specimen represents a primary bloodstream infection (BSI) or is secondary to a different type of infection (see Appendix B Secondary Bloodstream Infection (BSI) Guide). A BSI that is identified as secondary to another site of infection must meet one of the infection criteria detailed in this chapter and meet other requirements. Secondary BSIs are not reported as Laboratory Confirmed Bloodstream Infections in NHSN, nor can they be associated with the use of a central line.

NOTES:

- See individual protocol chapters for infection criteria for urinary tract infections (UTI), bloodstream infections (BSI), pneumonia (PNEU), ventilator-associated infections (VAE), and surgical site infections (SSI).
- For NHSN reporting purposes, the term "organism(s)" in this chapter includes viruses.
- Organisms belonging to the following genera cannot be used to meet any NHSN definition: *Blastomyces, Histoplasma, Coccidioides, Paracoccidioides, Cryptococcus and Pneumocystis*. These organisms are typically causes of community-associated infections and are rarely known to cause healthcare-associated infections, and therefore are excluded.
- Antibiograms of the blood and isolates from potential primary sites of infection do not have to match for purposes of determining the source of BSIs (see "matching organisms" below).
- A **matching organism** is defined as one of the following:
  1. If genus and species are identified in both specimens, they must be the same.
     a. **Example:** An intraabdominal specimen is used as an element to meet IAB definition and is growing *Enterobacter cloacae*. A blood specimen with a collection date in the IAB

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Organ/Space SSI Criteria – Site-Specific Criteria

Table 3. Specific Sites of an Organ/Space SSI

Category	Specific Site	Category	Specific Site
BONE	Osteomyelitis	MED	Mediastinitis
BRST	Breast abscess or mastitis	MEN	Meningitis or ventriculitis
CARD	Myocarditis or pericarditis	ORAL	Oral cavity infection (mouth, tongue, or gums)
DISC	Disc space infection	OREP	Deep pelvic tissue infection or other infection of the male or female reproductive tract
EAR	Ear, mastoid infection	PJI	Periprosthetic joint infection
EMET	Endometritis	SA	Spinal abscess/infection
ENDO	Endocarditis	SINU	Sinusitis
GIT	Gastrointestinal (GI) tract infection	UR	Upper respiratory tract, pharyngitis, laryngitis, epiglottitis
IAB	Intraabdominal infection, not specified elsewhere	USI	Urinary System Infection
IC	Intracranial infection	VASC	Arterial or venous infection
JNT	Joint or bursa infection	VCUF	Vaginal cuff infection
LUNG	Other infection of the lower respiratory tract		

(Criteria for these sites can be found in Chapter 17 (Surveillance Definitions for Specific Types of Infections)

Note: Appendix contains a list of all NHSN operative procedure categories and the site-specific SSIs that may be attributable to each category.

SSI Specific Event Types Available for SSI Attribution by Operative Procedure Category

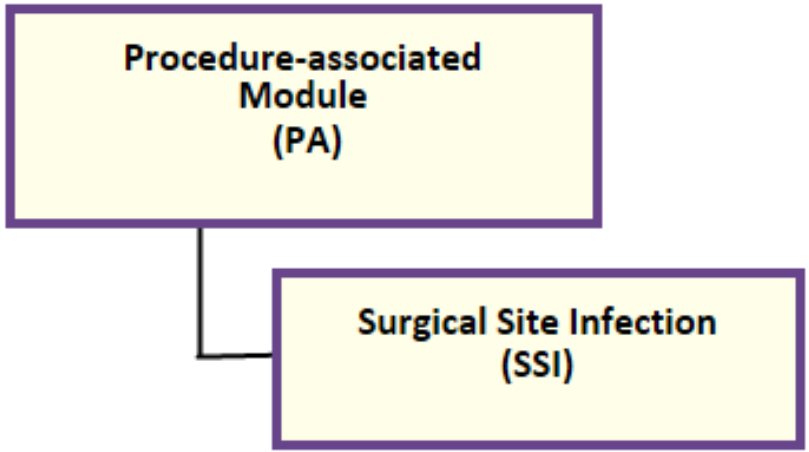
APPENDIX.

Specific event types available for SSI attribution by NHSN procedure category

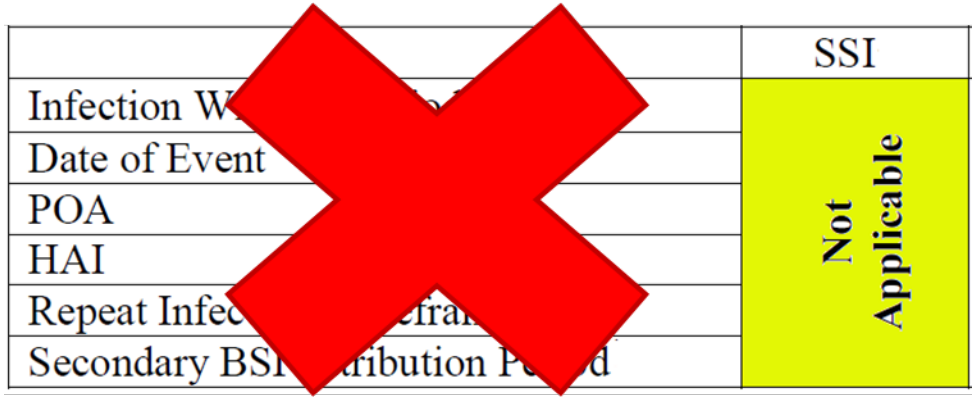
Operative Procedure Category	Specific Event Type
AAA - Abdominal aortic aneurysm repair	DIP - Deep Incisional Primary ENDO - Endocarditis GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary VASC - Arterial or venous infection
AMP - Limb amputation	BONE - Osteomyelitis DIP - Deep Incisional Primary JNT - Joint or bursa SIP - Superficial Incisional Primary
APPY - Appendix surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
AVSD - AV shunt for dialysis	DIP - Deep Incisional Primary SIP - Superficial Incisional Primary VASC - Arterial or venous infection
BILI - Bile duct, liver or pancreatic surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary

Accurate SSI Event Reporting

SSI – Procedure-associated Module



The SSI surveillance protocol has its own definitions for classifying infections. Refer to the SSI protocol for specific guidance for SSI event determination.



SSI Event Detail: Surveillance Period for SSI

- The timeframe following an NHSN operative procedure for monitoring and identifying an SSI event. The surveillance period is determined by the NHSN operative procedure category [see Table 2].

For example:

  - COLO has a 30-day SSI surveillance period
  - KPRO has a 90-day SSI surveillance period

- Superficial incisional SSIs are only followed for a 30-day period for all procedure types
- Secondary incisional SSIs [SIS and DIS SSI events] are only followed for a 30-day period regardless of the surveillance period for the primary site
- **Note**: A return trip to the OR via the same surgical site ends the surveillance period for the prior NHSN operative procedure and begins a new SSI surveillance period if an NHSN operative procedure is performed

Table 2. Surveillance Periods for SSI Following Selected NHSN Operative Procedure Categories. Day 1 = the date of the procedure.

30-day Surveillance			
Category	**Operative Procedure**	**Category**	**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

90-day Surveillance	
Category	**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

Notes:

- Superficial incisional SSIs are only followed for a 30-day period for all procedure types.
- Secondary incisional SSIs are only followed for a 30-day period regardless of the surveillance period for the primary site.

SSI Event: Date of event [DOE] for SSI

- 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
  - The type of SSI (superficial incisional, deep incisional, or organ/space) reported and the date of event assigned must reflect the deepest tissue level where SSI criteria are met during the surveillance period

SSI Event: Timeframe for SSI elements

- SSI guidelines do not offer a strict timeframe for elements of criteria to occur but in NHSN's experience, all elements required to meet an SSI criterion usually occur within a 7-10 day timeframe with typically no more than 2-3 days between elements
- To ensure that all elements associate to the SSI, the elements must occur in a relatively tight timeframe
  - **Example**: An element that occurs on day 2 of the surveillance period with another element that occurs three weeks later should not be used to cite an SSI
- Each case differs based on the individual elements occurring and the type of SSI but the DOE for an SSI must occur within the appropriate 30- or 90-day SSI surveillance period

SSI Event: Secondary BSI Scenarios for SSI

Scenario 1: 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 SSI criterion AND the blood specimen is collected during the secondary BSI attribution period. The secondary BSI attribution period for SSI is a 17-day period that includes the date of SSI event, 3 days prior, and 13 days after.

OR

Scenario 2 [Organ/Space SSI Only]: An organism identified in the blood specimen is an element that is used to meet the NHSN Organ/Space SSI site-specific infection criterion and is collected during the timeframe for SSI elements.

Secondary BSI

Scenario 1

SSI Secondary BSI Attribution Period
(3 days before Date of Event
+
Date of Event
+
13 days after Date of Event)

17 days

Post-Op Day	SSI Secondary BSI Attribution Period
9	
10	
11	
12	
13	DOE for an SSI
14	
15	
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Secondary BSI Scenario 2

IAB-Intraabdominal infection, not specified elsewhere, including gallbladder, bile ducts, liver (excluding viral hepatitis), spleen, pancreas, peritoneum, retroperitoneal, subphrenic or subdiaphragmatic space, or other intraabdominal tissue or area not specified elsewhere

Example IAB '2b'

Intraabdominal infections must meet at least ***one*** of the following criteria:

1. Patient has organism(s) identified from an abscess or from purulent material from intraabdominal space by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST).
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
   (See Reporting Instructions)
   AND
   organism(s) identified from blood by a culture or non-culture based microbiologic testing method, which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST). The organism(s) identified in the blood must contain at least one MBI organism. (See Appendix A of the BSI protocol)

SSI Event: Clinical Correlation

Physician documentation of antimicrobial treatment for site-specific infection

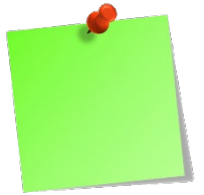
- Used with site-specific criteria
  - Example: IAB, GIT
    - Used with equivocal imaging

IAB '3b'

3. Patient has at least ***two*** of the following: fever (>38.0°C), hypotension, nausea*, vomiting*, abdominal pain or tenderness*, elevated transaminase level(s)*, or jaundice*
   And at least *one* of the following:
   a. organism(s) seen on Gram stain and/or identified from intraabdominal fluid or tissue obtained during invasive procedure or from an aseptically-placed drain in the intraabdominal space (for example, 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, for example, not Active Surveillance Culture/Testing (ASC/AST).
   b. organism(s) identified from blood by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST). The organism(s) identified in the blood must contain at least one MBI organism (See Appendix A of the BSI protocol)
   AND
   imaging test evidence suggestive of infection (for example, ultrasound, CT scan, MRI, ERCP, radiolabel scans [gallium, technetium, etc.] or on abdominal x-ray), which if equivocal is supported by clinical correlation, specifically, physician documentation of antimicrobial treatment for intraabdominal infection.†

** With no other recognized cause*

SSI Event: Other Recognized Cause



- What is meant by “with no other recognized cause”* seen next to some signs and symptoms used in various site-specific (chapter 17) definitions that are available for Organ/Space SSI attribution?
  - A sign/symptom is eligible for use in meeting the SSI criteria unless there is physician documentation within the medical record that specifically states the sign/symptom is due to something other than an SSI
  - The local facility must make this determination based on the documentation available in the medical record

SSI Event: Gross Anatomical Exam

- Evidence of infection elicited or visualized on physical examination or observed during an invasive procedure. This includes findings elicited on physical examination of a patient during admission or subsequent assessments of the patient and may include findings noted during a medical/invasive procedure, dependent upon the location of the infection as well as the NHSN infection criterion.
- Examples:
  - An intraabdominal abscess will require an invasive procedure to actually visualize the abscess.
  - Visualization of pus or purulent drainage (includes from a drain).
  - SSI only: Abdominal pain or tenderness **post Cesarean section (CSEC) or hysterectomy (HYST or VHYS)** is sufficient gross anatomic evidence of infection without an invasive procedure to meet general Organ/Space SSI criterion “c” when OREP or EMET is met. Allowing the documentation of abdominal pain or tenderness as gross anatomic evidence of infection to meet general Organ/Space SSI criterion “c” enables the user to report an SSI-OREP or SSI-EMET.
- **NOTE:** Imaging test evidence of infection is a unique and separate element from gross anatomic evidence of infection. Imaging test evidence has distinct findings in the NHSN definitions (for example, IAB ‘3b’).

SSI Event: Purulence

Clarification of SSI Criterion – Purulence

SSI FAQ

Q7. Does NHSN have a definition for purulence?

NHSN does not define purulence as there is no standard, clinically agreed upon definition. The descriptors “pus” or “purulence” are sufficient evidence of infection. Documentation that includes descriptors such as milky, thick, viscous, creamy, opaque, yellow, or green may also be accepted evidence of purulence when used in combination with another eligible descriptor. For example, fluid only described as yellow, or only described as thick, is not sufficient. However, if the terms are combined, then they may be more representative of purulence (for example: fluid described as thick and yellow).

Gram stain results such as WBCs or PMNs cannot be used define purulence within the SSI protocol.

Reporting Instructions: SSI Event [Beginning on page 9-17 of the 2022 SSI Protocol]

1. Excluded Organisms
2. Attributing SSI to an NHSN operative procedure when there is evidence of infection at the time of the primary surgery
3. Infection present at time of surgery (PATOS)
4. Multiple tissue levels are involved in the infection
5. Attributing SSI to a NHSN procedure when several are performed on different dates
6. Attributing SSI to NHSN procedures that involve multiple primary incision sites

Reporting Instructions: SSI Event

7. Attributing SSI to NHSN procedures that have secondary incision sites
8. SSI detected at another facility
9. SSI attribution after multiple types of NHSN procedures are performed during a single trip to the OR
10. SSI following invasive manipulation/accession of the operative site
11. Reporting instructions for post-operative infection scenarios

Infection Present at time of surgery (PATOS) SSI Event Reporting Instruction #3

Check out the PATOS Quick Learn found on the SSI Training Page!

- PATOS is a YES/NO field found on the SSI event form and denotes that there is evidence of infection visualized during the operative procedure to which the SSI is attributed
- An SSI must first be identified within the surveillance period following an NHSN operative procedure to answer the PATOS question
- The evidence of infection must be noted intraoperatively and documented within the **narrative portion** of the operative note or report of surgery
- PATOS is tissue level specific meaning the documented infection must be at the same tissue level of subsequent SSI for PATOS to be YES
- Pathology reports, culture results, wound classification, trauma status, imaging test findings, etc. cannot be used with answering the PATOS question

PATOS

- **What are some examples of documentation that indicates evidence of infection?**
  - abscess, infection, purulence/pus, phlegmon, “feculent peritonitis”

- **What are some examples of documentation that does not indicate evidence of infection?**
  - colon perforation, contamination, necrosis, gangrene, fecal spillage, nicked bowel during procedure, murky fluid, or documentation of inflammation

- **Do SSI events where PATOS = YES is documented on the SSI event form need to be reported to NHSN?**
  - YES! These are still SSI events. SSI events are reported to NHSN regardless of noted evidence of infection at time of surgery.

Scenarios

Scenario #1

Teaching Points:

- **Inpatient vs. Outpatient Operative Procedure**
- **Wound Class Assignment**
- **SSI Identification**
- **Pathogen Assignment**

Scenario #1:

On 4/12 a 45-year-old patient is admitted to the hospital and goes to the OR for a CHOL procedure. The patient is discharged the following day [4/13], within 20 hours of admission.

On 4/25 the patient is readmitted to the hospital with documented cellulitis with complaints of redness and drainage at their CHOL incision site. The physician cultures the drainage and prescribes antibiotics. No documentation of infection at a deeper tissue level. The 4/25 incision culture results: Moderate *Coagulase Negative Staphylococcus Species.*

Scenario #1 – Knowledge Check #1

The facility monitors CHOL inpatient operative procedures in their monthly reporting plan. Is this procedure included in the CHOL denominator data as an inpatient operative procedure for April?

A. Yes – The admission and discharge dates are different calendar days

B. No – The patient was admitted less than 24 hours

Scenario #1 – Knowledge Check #1

A. Yes – The admission and discharge dates are different calendar days

Rationale:

- **NHSN Inpatient Operative Procedure**: An NHSN operative procedure performed on a patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.
  - NHSN does not go by billing status or whether the patient is admitted for 24 hours to define inpatient vs. outpatient operative procedure.

Scenario #1 – Knowledge Check #2

When submitting the procedure as denominator data how does the IP determine the wound class for the CHOL?

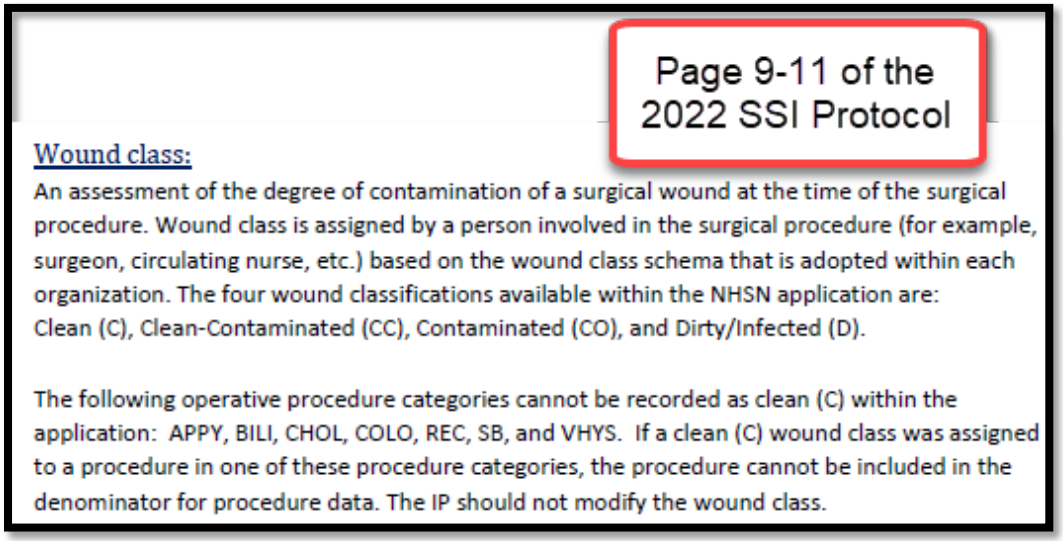
A. The IP should make a wound class determination based on their interpretation of the operative report

B. The wound class should be assigned by someone participating in the surgical case and not the IP

Scenario #1 – Knowledge Check #2

B. The wound class should be assigned by someone participating in the surgical case and not the IP

Rationale:



Page 9-11 of the 2022 SSI Protocol

Wound class:

An assessment of the degree of contamination of a surgical wound at the time of the surgical procedure. Wound class is assigned by a person involved in the surgical procedure (for example, surgeon, circulating nurse, etc.) based on the wound class schema that is adopted within each organization. The four wound classifications available within the NHSN application are: Clean (C), Clean-Contaminated (CC), Contaminated (CO), and Dirty/Infected (D).

The following operative procedure categories cannot be recorded as clean (C) within the application: APPY, BILI, CHOL, COLO, REC, SB, and VHYS. If a clean (C) wound class was assigned to a procedure in one of these procedure categories, the procedure cannot be included in the denominator for procedure data. The IP should not modify the wound class.

Is an SSI Identified?

A. Yes – Superficial Incisional SSI
B. No – this is just cellulitis
C. No – common commensals are excluded from SSI surveillance

Scenario #1 – Knowledge Check #3

A. Yes – Superficial Incisional SSI

Rationale:

- Superficial Incisional SSI criterion 'b' met
- Common commensals are not excluded from meeting SSI criteria
- Documentation of cellulitis does not exclude an event from SSI reporting if SSI criteria are met

Table 1. Surgical Site Infection Criteria

Criterion	Surgical Site Infection (SSI)
	Superficial incisional SSI Must meet the following criteria:
	Date of event 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** patient has at least ***one*** of the following: a. purulent drainage from the superficial incision. b. organism(s) 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 (for example, not Active Surveillance Culture/Testing (ASC/AST)). c. superficial incision that is deliberately opened by a surgeon, physician* or physician designee and culture or non-culture based testing of the superficial incision or subcutaneous tissue is not performed **AND** patient has at least one of the following signs or symptoms: localized pain or tenderness; localized swelling; erythema; or heat. d. diagnosis of a superficial incisional SSI by a physician* or physician designee. * The term physician for the purpose of application of the NHSN SSI criteria may be interpreted to mean a surgeon, infectious disease physician, emergency physician, other physician on the case, or physician's designee (nurse practitioner or physician's assistant).

Scenario #1 – Knowledge Check #3

FAQ

Pathogen Assignment

SSI FAQ #5

Q5. Are common commensal organisms excluded from meeting SSI criteria?

No. The only organisms excluded from SSI event reporting are found in the SSI protocol [PDF – 1 MB] on page 9-17 (SSI Event Reporting Instruction #1 ***Excluded Organisms***).

- SSI Event Reporting Instruction #1 ***Excluded Organisms*** addresses only organisms excluded from SSI event reporting

SSI Event Reporting Instruction #1 Page 9-18 2022 SSI Protocol

SSI Event Reporting Instructions:

1. **Excluded organisms:** Well-known community associated organisms (organisms belonging to the following genera: *Blastomyces, Histoplasma, Coccidioides, Paracoccidioides, Cryptococcus and Pneumocystis)* and/or organisms associated with latent infections (for example, herpes, shingles, syphilis, or tuberculosis) are excluded from meeting SSI criteria.

Scenario #2

Teaching Points:

- **Tissue Level of SSI Assigned**
- **SSI DOE Assignment**

Scenario #2:

On 11/1 a patient is admitted to the hospital for an HPRO – revision. There is no evidence of infection at the time of the surgery. The patient has an unremarkable postoperative course, and the patient is discharged on 11/4.

On 11/18 the patient is seen in the surgeon's office with complaints of pain and swelling since 11/16. The patient is noted with purulence at the superficial tissue level. The patient is given antibiotics and told to follow up within 1 week. On 11/21 the patient presents to the Emergency Department with increased pain at the surgical site. The patient returns to the OR on 11/22, the surgeon documents a sinus tract communicating with the joint space.

What gets reported to NHSN?

A. Superficial Incisional SSI
B. Deep Incisional SSI
C. Organ/Space SSI ‘PJI’
D. Both a Superficial Incisional SSI and an Organ/Space SSI ‘PJI’

Scenario #2 – Knowledge Check #4

C. Organ/Space SSI ‘PJI’

Rationale:

Superficial Incisional

Surgical Site Infection (SSI)

Superficial incisional SSI

Must meet the following criteria:

Date of event 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

patient has at least ***one*** of the following:

a. purulent drainage from [illegible] incision.

b. organism(s) identifie[illegible] obtained specimen from the superficia[illegible] subcute[illegible] tissue by a culture or non-culture based mic[illegible] met[illegible] which is performed for purposes of clinic[illegible] r example, not Active Surveillance Cultur[illegible] ring (AS[illegible]

c. superficial incision t[illegible] liberat[illegible] d by a surgeon, physician* or physician designee a[illegible] -culture based testing of the superficial incision or subcutaneous tissue is not performed

AND

patient has at least one of the following signs or symptoms: localized pain or tenderness; localized swelling; erythema; or heat.

d. diagnosis of a superficial incisional SSI by a physician* or physician designee.

* The term physician for the purpose of application of the NHSN SSI criteria may be interpreted to mean a surgeon, infectious disease physician, emergency physician, other physician on the case, or physician’s designee (nurse practitioner or physician’s assistant).

Organ/Space SSI ‘PJI’

Organ/Space SSI

Must meet the following criteria:

Date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

AND

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

AND

patient has at least ***one*** of the following:

a. purulent drainage from a drain that is placed into the organ/space (for example, closed suction drainage system, open drain, T-tube drain, CT-guided drainage).

b. organism(s) identified from 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 (for example, not Active Surveillance Culture/Testing (ASC/AST)).

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 listed in Table 3. These criteria are found in the Surveillance Definitions for Specific Types of Infections (Chapter 17)

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PJI – Periprosthetic Joint Infection (for use as Organ/Space SSI following HPRO and KPRO only)

Joint or bursa infections must meet at least ***one*** of the following criteria:

1. ***Two*** positive periprosthetic specimens (*tissue or fluid*) with at least one matching organism, identified by culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis and treatment, for example, not Active Surveillance Culture/Testing (ASC/AST).
2. A sinus tract* communicating with the joint identified on gross anatomic exam.
3. Having ***three*** of the following minor criteria:
   a. elevated serum C-reactive protein (CRP; >100 mg/L) ***and*** erythrocyte sedimentation rate (ESR; >30 mm/hr.)
   b. elevated synovial fluid white blood cell (WBC; >10,000 cells/uL) count *OR* “++” (*or greater*) change on leukocyte esterase test strip of synovial fluid.
   c. elevated synovial fluid polymorphonuclear neutrophil percentage (PMN% >90%)
   d. positive histological analysis of periprosthetic tissue (>5 neutrophils (PMNs) per high power field).
   e. organism(s) identified from a single positive periprosthetic specimen (*tissue or fluid*) by culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis and treatment, for example, not Active Surveillance Culture/Testing (ASC/AST).

* A sinus tract is defined as a narrow opening or passageway that can extend in any direction through soft [illegible]

Scenario #2 – Knowledge Check #4

C. Organ/Space SSI ‘PJI’

Rationale:

- SSI Event Reporting Instruction #4 is applied.
  - SSI reported must reflect the deepest tissue level where SSI criteria are met during the surveillance period: Organ/Space SSI ‘PJI’ therefore gets reported.

SSI Event Reporting Instruction # 4
Page 9-20 of the 2022 SSI Protocol

4. **Multiple tissue levels are involved in the infection:** The type of SSI (superficial incisional, deep incisional, or organ/space) reported must reflect the deepest tissue level where SSI criteria are met during the surveillance period.
   - Report infection that meets criteria for organ/space SSI as an organ/space SSI, regardless of superficial or deep tissue involvement.
   - Report infection that meets criteria for deep incisional SSI as a deep incisional SSI, regardless of superficial tissue involvement.
   - If an SSI started as a deep incisional SSI on day 10 of the SSI surveillance period and then a week later (day 17 of the SSI surveillance period) meets criteria for an organ space SSI, the DOE would be the date of the organ/ space SSI.

Only one SSI Event gets reported linked to the HPRO!

What is the DOE assigned to the SSI event?

A. 11/16
B. 11/18
C. 11/21
D. 11/22

Scenario #2 – Knowledge Check #5

D. 11/22

Date of event (DOE) for SSI:
For an SSI, the DOE 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. The type of SSI (superficial incisional, deep incisional, or organ/space) reported and the date of event assigned must reflect the deepest tissue level where SSI criteria are met during the surveillance period. Synonym: infection date.

Rationale:

- 11/22 is the date of the first element used to meet the SSI infection criterion [sinus tract noted in OR]
  - Organ/Space SSI criterion ‘c’ met 11/22
  - PJI criterion ‘2’ met 11/22

Scenario #3

Teaching Points:

- # of Denominators to Report
- SSI Surveillance Period/Return to OR
- SSI Identification
- Gross Anatomical Evidence of Infection
- PATOS application
- Procedure Attribution to an SSI

Scenario #3:

On 2/23 a COLO is performed on a patient for obstructing cecal carcinoma. JP drain is placed within the abdomen at end of surgery.

On 2/28 the patient experiences acute onset of nausea with noted feculent drainage in their JP drain. The patient returns to the OR and an anastomotic leak with feculent contamination is documented. No cultures performed. COLO and XLAP NHSN operative procedure codes assigned. The patient is discharged on 3/4.

On 3/7 patient presents to Emergency Department with complaints of severe abdominal pain. A CT of the abdomen is performed that indicates an intraabdominal fluid collection concerning for abscess. The patient returns to the OR for an XLAP. An intraabdominal abscess is noted. Abscess cultures are performed with *E.coli* and *C. albicans* identified.

This facility monitors COLO in their Monthly Reporting Plan. Based on Scenario #3, how many COLOs are included in the February COLO denominator data for this patient?

A. 1

B. 2

C. 0

Scenario #3 – Knowledge Check #6

B. 2

Rationale:

- COLO procedures on 2/23 and 2/28: **2 COLO procedures** are reported to NHSN.
- **Requirement for SSI Surveillance**:
  - Collect SSI event (numerator) and operative procedure (denominator) data on all procedures included in the selected operative procedure categories indicated on the facility's monthly reporting plan.
- Procedure inclusion in SSI surveillance is based on the procedure performed (not on the patient) meaning the same patient may undergo more than one NHSN operative procedure and that same patient therefore has another opportunity for an SSI.
- The procedure starts the surveillance period and in the case of another NHSN operative procedure of that surgical site, the surveillance period is 'reset' with a new NHSN operative procedure.

Is an SSI identified linked to the 2/23 COLO?

A. Yes

B. No

Scenario #3 – Knowledge Check #7

B. No

Rationale:

- Feculent drainage within the JP drain is not gross anatomical evidence of infection
- An anastomotic leak with fecal contamination documented as seen within the intraabdominal space is not gross anatomical evidence of infection
- Only sign/symptom noted is nausea
- No cultures performed
- No imaging performed
- No SSI criteria are met linked to the 2/23 COLO

Scenario #3 – Knowledge Check #8

Is an SSI identified linked to the 2/28 COLO/XLAP?

A. Yes

B. No – any infection that occurs following the 2/28 COLO/XLAP is part of an ongoing process for this patient

Scenario #3 – Knowledge Check #8

A. Yes

Rationale:

Organ/Space SSI

Organ/Space SSI

Must meet the following criteria:

Date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

AND

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

AND

patient has at least ***one*** of the following:

a. purulent drainage from a drain that is placed into the organ/space (for example, closed suction drainage system, open drain, T-tube drain, CT-guided drainage).

b. organism(s) identified from 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 (for example, not Active Surveillance Culture/Testing (ASC/AST)).

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 listed in Table 3. These criteria are found in the Surveillance Definitions for Specific Types of Infections (Chapter 17)

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IAB - Intraabdominal

IAB-Intraabdominal infection, not specified elsewhere, including gallbladder, bile ducts, liver (excluding viral hepatitis), spleen, pancreas, peritoneum, retroperitoneal, subphrenic or subdiaphragmatic space, or other intraabdominal tissue or area not specified elsewhere

Intraabdominal infections must meet at least ***one*** of the following criteria:

1. Patient has organism(s) identified from an abscess or from purulent material from intraabdominal space by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST).
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
   (See Reporting Instructions)
   AND
   organism(s) identified from blood by a culture or non-culture based microbiologic testing method, which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST). The organism(s) identified in the blood must contain at least one MBI organism. (See Appendix A of the BSI protocol)
3. Patient has at least ***two*** of the following: fever (>38.0°C), hypotension, nausea*, vomiting*, abdominal pain or tenderness*, elevated transaminase level(s)*, or jaundice*
   And at least *one* of the following:
   a. organism(s) seen on Gram stain and/or identified from intraabdominal fluid or tissue obtained during invasive procedure or from an aseptically-placed drain in the intraabdominal space (for example, 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, for example, not Active Surveillance Culture/Testing (ASC/AST).
   b. organism(s) identified from blood by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST). The organism(s) identified in the blood must contain at least one MBI organism (See Appendix A of the BSI protocol)
   AND
   imaging test evidence suggestive of infection (for example, ultrasound, CT scan, MRI, ERCP, radiolabel scans [gallium, technetium, etc.] or on abdominal x-ray), which if equivocal is supported by clinical correlation, specifically, physician documentation of antimicrobial treatment for intraabdominal infection.*

** With no other recognized cause*

A. Yes

Rationale:

- The 2/28 COLO/XLAP operative episode begins a new SSI surveillance period.
- An SSI-IAB event is identified on 3/7 [organisms identified from an intraabdominal abscess]
  - Organ Space ‘b’ and ‘c’ met
  - IAB ‘1’ met
- The 3/7 SSI-IAB event is linked back to the 2/28 COLO/XLAP operative episode [most recent procedure]
- Remember: the concept of an ‘ongoing process’ does not exist in SSI surveillance.

How is the PATOS question answered on the SSI event form?

A. PATOS = NO

B. PATOS = YES

C. No SSI is identified so no need to answer the PATOS question

Scenario #3 – Knowledge Check #9

A. PATOS= NO

Rationale:

1. 2/28 COLO/XLAP is performed
2. On 3/7 an SSI-IAB event identified linked to the 2/28 COLO/XLAP
3. SSI event form is completed and PATOS is a required field on the SSI event form
4. For the PATOS field: review the narrative of the 2/28 COLO/XLAP operative note to determine whether there is evidence of infection documented at the organ/space tissue level
5. **No evidence of infection at the organ/space tissue level is documented in the 2/28 COLO/XLAP narrative** [remember documentation of feculent material/ drainage/ contamination/ anastomotic leak is not gross anatomical evidence of infection]
6. Indicate **PATOS = NO** on the SSI Event Form

To which 2/28 procedure is the subsequent SSI-IAB event attributed?

A. COLO
B. XLAP
C. No SSI is identified so no need to determine attribution

Scenario #3 – Knowledge Check #10

A. COLO

Rationale:

- On 2/28 - COLO and XLAP performed via same incision during the same trip to the OR.
- SSI attribution is not clear based on medical record documentation.
- According to **SSI Event Reporting Instruction #9**, SSI attribution should be based on **Table 4** and attribution is to the COLO procedure.

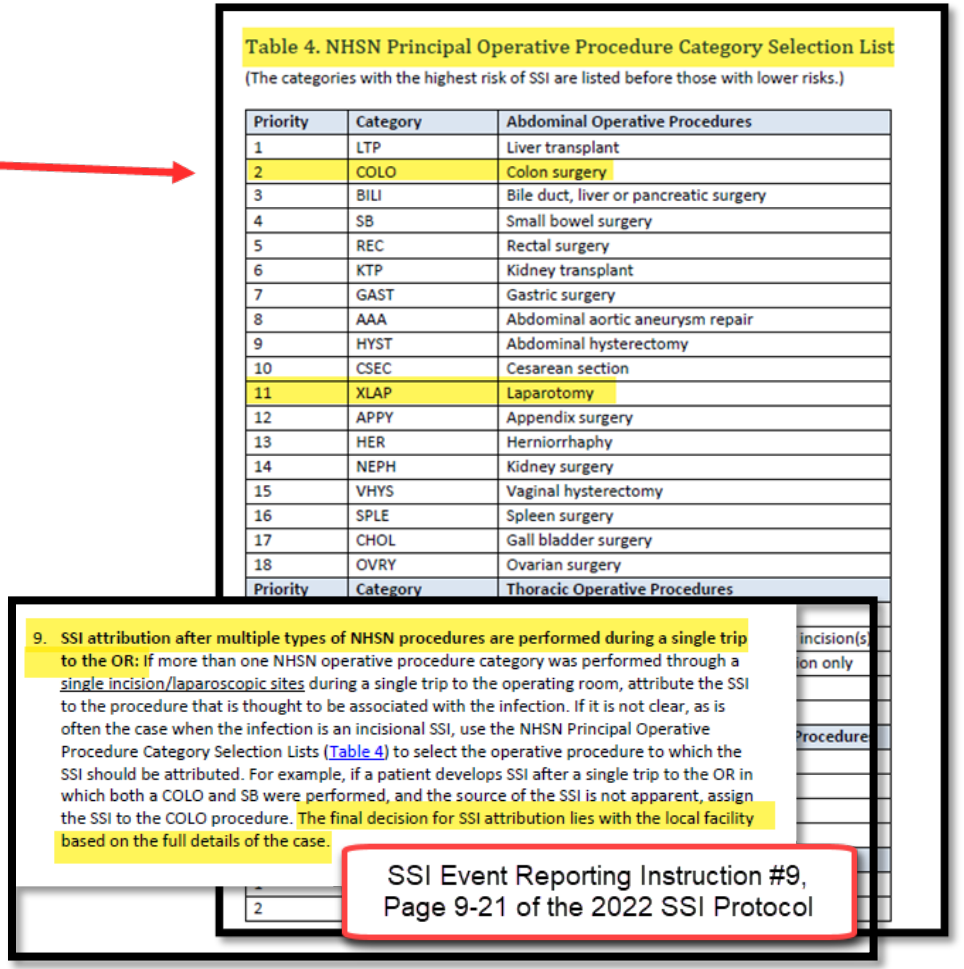


Table 4. NHSN Principal Operative Procedure Category Selection List

(The categories with the highest risk of SSI are listed before those with lower risks.)

Priority	Category	Abdominal Operative Procedures
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	OVRY	Ovarian surgery
Priority	Category	Thoracic Operative Procedures
1	CARD	Cardiac surgery
2	VALV	Heart valve surgery

9. **SSI attribution after multiple types of NHSN procedures are performed during a single trip to the OR:** 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. For example, if a patient develops SSI after a single trip to the OR in which both a COLO and SB were performed, and the source of the SSI is not apparent, assign the SSI to the COLO procedure. The final decision for SSI attribution lies with the local facility based on the full details of the case.

SSI Event Reporting Instruction #9, Page 9-21 of the 2022 SSI Protocol

Scenario #4

Teaching Points:

- Organ/Space site-specific definition
- 2nd BSI attribution

Scenario #4:

On 7/2 a patient undergoes a Robotic-Assisted Total Laparoscopic Hysterectomy [HYST]. Discharged on 7/4.

On 7/8 the patient presents to the Emergency Department with complaints of new significant abdominal pain. A CT of the abdomen/pelvis is performed that indicates a postoperative pelvic abscess 3.1 x 2.3 cm. Blood cultures are drawn.

On 7/9 a CT-guided drainage of the pelvic abscess is performed. Both the pelvic abscess culture and 2/2 blood cultures identify *E. coli*.

This is an Organ/Space SSI event. What organ/space site-specific definition should be applied?

A. OREP – Deep pelvic tissue infection or other infection of the male or female reproductive tract

B. IAB – Intraabdominal infection, not specified elsewhere

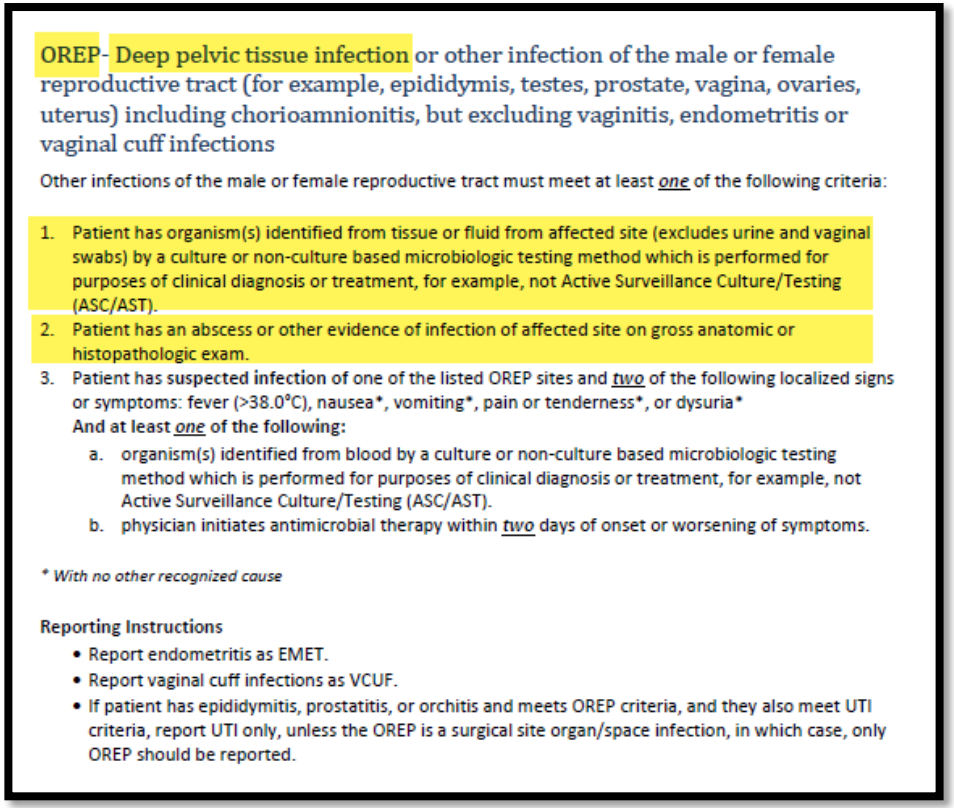
C. GIT – Gastrointestinal tract infection

Scenario #4 – Knowledge Check #11

A. OREP

Rationale:

- Deep pelvic tissue infection or other infection of the male or female reproductive tract [OREP] applied as a **pelvic abscess** is identified
  - Infections of the deep pelvic tissues or other infection of the male or female reproductive tract OREP is applied
  - OREP '1' and '2' met as organisms identified from a pelvic abscess



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

Other infections of the male or female reproductive tract 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) by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST).
2. Patient has an abscess or other evidence of infection of affected site on gross anatomic or histopathologic exam.
3. Patient has suspected infection of one of the listed OREP sites and *two* of the following localized signs or symptoms: fever (>38.0°C), nausea*, vomiting*, pain or tenderness*, or dysuria*
   And at least *one* of the following:
   a. organism(s) identified from blood by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST).
   b. physician initiates antimicrobial therapy within *two* days of onset or worsening of symptoms.

** With no other recognized cause*

Reporting Instructions

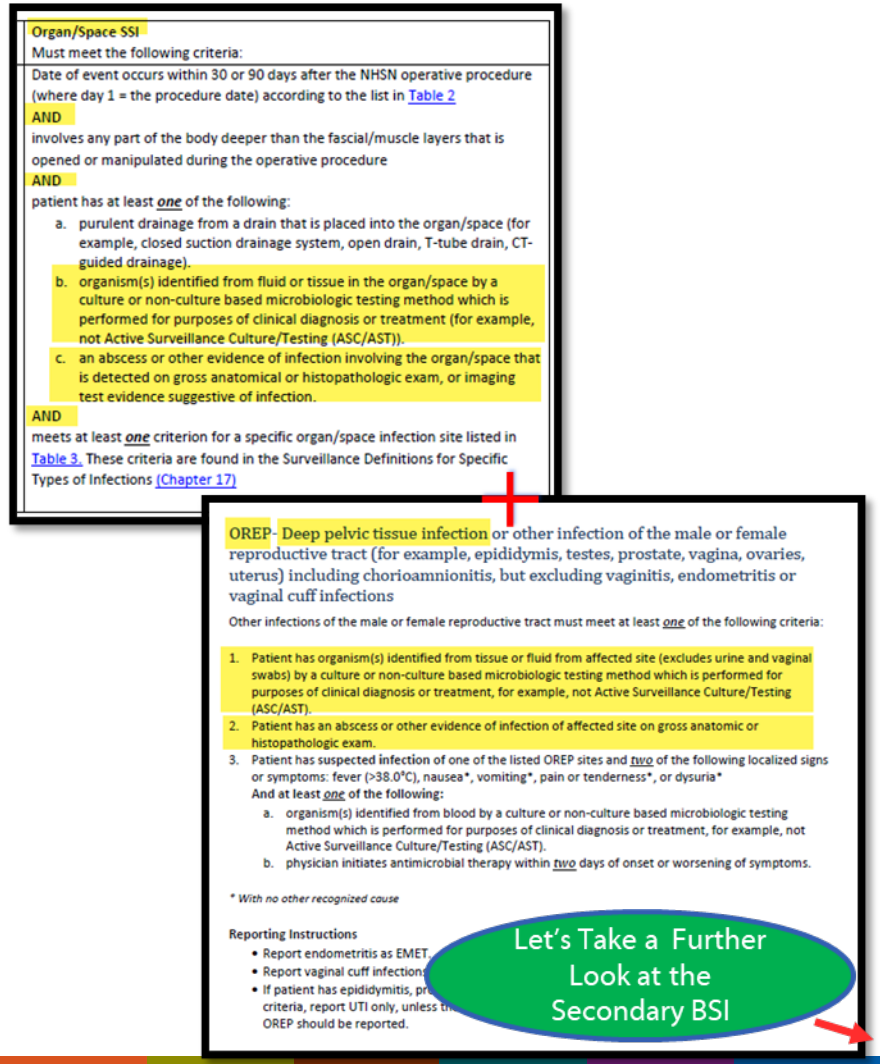
- Report endometritis as EMET.
- Report vaginal cuff infections as VCUF.
- If patient has epididymitis, prostatitis, or orchitis and meets OREP criteria, and they also meet UTI criteria, report UTI only, unless the OREP is a surgical site organ/space infection, in which case, only OREP should be reported.

Scenario #4 – Knowledge Check #11

A. OREP

Rationale:

- Organ/Space ‘b’ and ‘c’ met
- OREP ‘1’ and ‘2’ met
- **SSI DOE is 7/8** [Organ/Space ‘c’ met] as this is the date the of first element met used to meet criterion [CT indicates a postoperative pelvic abscess]
  - 7/8 + Blood cultures with *E.coli* match 7/9 pelvic abscess culture with *E.coli* and fall within secondary BSI attribution period of 7/8 SSI-OREP



Scenario #4 – Knowledge Check #11

Rationale:

7/2 HYST– 30-Day SSI Surveillance Period

SSI Secondary BSI Attribution Period is based off SSI DOE

(3 days before Date of Event
+
7/8 DOE
+
13 days after Date of Event)

17 days

Date of Event	SSI Secondary BSI Attribution Period
7/4	
7/5	
7/6	
7/7	
7/8	**DOE for SSI-OREP, Blood cx's + *E.coli***
7/9	Pelvic abscess *E.coli*
7/10	
7/11	
7/12	
7/13	
7/14	
7/15	
7/16	
7/17	
7/18	
7/19	
7/20	
7/21	

OREP vs. IAB. vs. GIT

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

IAB-Intraabdominal infection, not specified elsewhere, including gallbladder, bile ducts, liver (excluding viral hepatitis), spleen, pancreas, peritoneum, retroperitoneal, subphrenic or subdiaphragmatic space, or other intraabdominal tissue or area not specified elsewhere

GIT-Gastrointestinal tract infection (esophagus, stomach, small and large bowel, and rectum) excluding gastroenteritis, appendicitis, and *C. difficile* infection

Scenario #5

Teaching Points:

- **Same Operative Procedure category via separate incisions**
- **Level of SSI after BRST procedures**
- **Invasive Manipulation**

Scenario #5:

On 4/3 a patient undergoes bilateral skin sparing mastectomy with insertion of tissue expanders underneath muscle [both coded as BRST] during same trip to OR. The patient is discharged on 4/5.

On 4/13 the patient complains of drainage from right BRST surgical site. The left BRST has no evidence of infection. Patient returns to the OR where purulent fluid is documented from the superficial tissue level down to the level of the chest wall of the right breast.

You monitor BRST in your Monthly reporting plan. What gets reported to NHSN for this patient based on the scenario?

A. One BRST procedure
B. Two BRST procedures

Scenario #5 – Knowledge Check #12

B. Two BRST procedures

Rationale:

- Both BRST surgical sites monitored for SSI

Denominator Reporting Instruction #6, Page 9-25 of the 2022 SSI Protocol

6. **Same NHSN operative procedure category via separate incisions:** For operative procedures that can be performed via separate incisions during same trip to OR (specifically the following, AMP, BRST, CEA, FUSN, FX, HER, HPRO, KPRO, LAM, NEPH, OVRY, PVBY), separate *Denominator for Procedure* forms are completed. To document the duration of the procedures, indicate the procedure/surgery start time to procedure/surgery finish time for each procedure separately or, alternatively, take the total time for the procedures and split it evenly between procedures.

Notes:

- A COLO procedure with a colostomy formation is entered as one COLO procedure.
- Laparoscopic hernia repairs are considered one procedure, regardless of the number of hernias that are repaired in that trip to the OR. In most cases there will be only one incision time documented for this procedure. If more than one time is documented, total the durations. Open (specifically, non-laparoscopic) hernia repairs are reported as one procedure for each hernia repaired via a separate incision, (specifically, if two incisions are made to repair two defects, then two procedures will be reported). It is anticipated that separate incision times will be recorded for these procedures. If not, take the total time for both procedures and split it evenly between the two.

There is purulence from the superficial tissue level down to the chest wall of the right breast. What SSI criteria should be applied?

A. Superficial Incisional SSI
B. Deep Incisional SSI
C. Organ/Space SSI

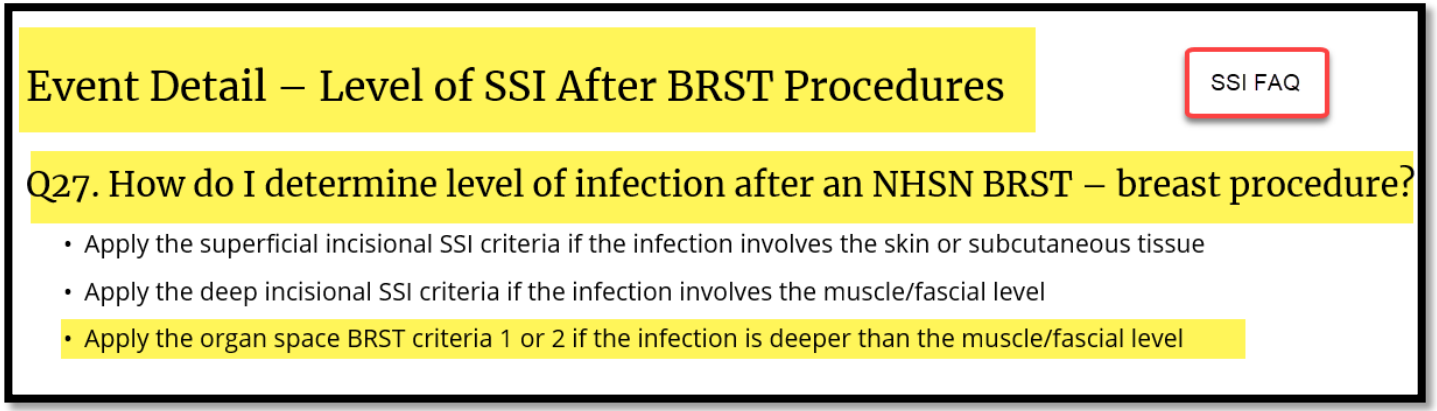
Scenario #5 – Knowledge Check #13

A. Organ/Space SSI

Rationale:

- BRST criterion '2' met

FAQ



Event Detail – Level of SSI After BRST Procedures

SSI FAQ

Q27. How do I determine level of infection after an NHSN BRST – breast procedure?

- Apply the superficial incisional SSI criteria if the infection involves the skin or subcutaneous tissue
- Apply the deep incisional SSI criteria if the infection involves the muscle/fascial level
- Apply the organ space BRST criteria 1 or 2 if the infection is deeper than the muscle/fascial level

Scenario #5 – Knowledge Check #13

A. Organ/Space SSI

Rationale:

- Documentation of infection involving all three tissue levels.
- Remember the SSI reported must reflect the deepest tissue level where SSI criteria are met during the surveillance period.
  - Organ/Space ‘c’ met
  - BRST criterion ‘2’ met

Organ/Space SSI

Must meet the following criteria:

Date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

AND

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

AND

patient has at least ***one*** of the following:

a. purulent drainage from a drain that is placed into the organ/space (for example, closed suction drainage system, open drain, T-tube drain, CT-guided drainage).
b. organism(s) identified from 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 (for example, not Active Surveillance Culture/Testing (ASC/AST)).
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 listed in Table 3. These criteria are found in the Surveillance Definitions for Specific Types of Infections (Chapter 17)

BRST-Breast infection or mastitis

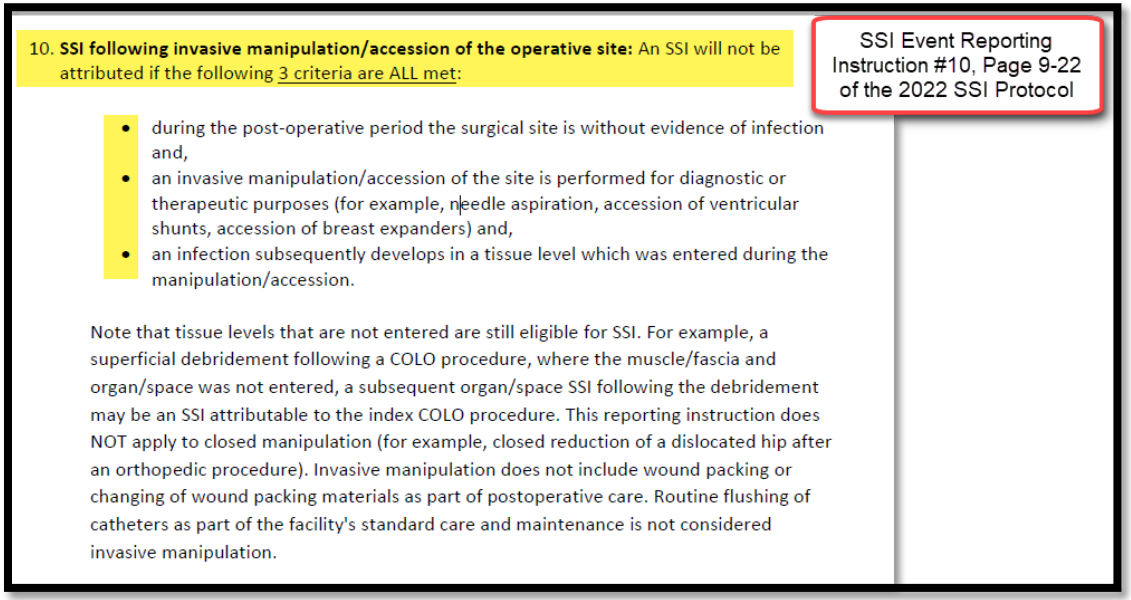
A breast abscess or mastitis must meet at least ***one*** of the following criteria:

1. Patient has organism(s) identified from affected breast tissue or fluid obtained by invasive procedure by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment, for example, not Active Surveillance Culture/Testing (ASC/AST).
2. Patient has a breast abscess or other evidence of infection on gross anatomic or histopathologic exam.
3. Patient has fever (>38.0°C) and local inflammation of the breast,
   AND
   Physician initiates antimicrobial therapy within 2 days of onset or worsening of symptoms.

Scenario #5 – Knowledge Check #13

Question: **But Wait!** What if on 4/11 saline was instilled in bilateral tissue expanders with no evidence of infection noted involving either breast?

- Answer: In that case, you review SSI Event Reporting Instruction #10 and if all 3 criteria are met then no SSI is reported – invasive manipulation of the surgical site occurred due to accession of breast expanders with saline



10. **SSI following invasive manipulation/accession of the operative site:** An SSI will not be attributed if the following 3 criteria are ALL met:

- during the post-operative period the surgical site is without evidence of infection and,
- an invasive manipulation/accession of the site is performed for diagnostic or therapeutic purposes (for example, needle aspiration, accession of ventricular shunts, accession of breast expanders) and,
- an infection subsequently develops in a tissue level which was entered during the manipulation/accession.

Note that tissue levels that are not entered are still eligible for SSI. For example, a superficial debridement following a COLO procedure, where the muscle/fascia and organ/space was not entered, a subsequent organ/space SSI following the debridement may be an SSI attributable to the index COLO procedure. This reporting instruction does NOT apply to closed manipulation (for example, closed reduction of a dislocated hip after an orthopedic procedure). Invasive manipulation does not include wound packing or changing of wound packing materials as part of postoperative care. Routine flushing of catheters as part of the facility's standard care and maintenance is not considered invasive manipulation.

SSI Event Reporting Instruction #10, Page 9-22 of the 2022 SSI Protocol

Scenario #6

Teaching Points:

- **Procedures with secondary incision sites**
- **24-Hour Reporting Instruction**
- **Level of SSI after Cardiac Procedures**

Scenario #6:

On 1/2 a 73-year-old female patient undergoes a CABG x3 with saphenous vein graft (CBGB). The patient returns to the OR within 15 hours of the conclusion of the CBGB for mediastinal exploration for a post-operative bleed. The patient is discharged on 1/9.

On 1/20 the patient presents to the Emergency Department with complaints of acute incisional pain and slight opening of sternal incision as well as slight drainage at the leg incision site. A physician cultured the drainage from the leg incision.

On 1/21 the patient is taken to the OR and the surgeon documented the sternal incision had dehisced down to just above the sternum. A culture of the deep sternal wound is collected. The leg incision site is not addressed. The 1/20 leg incision culture and 1/21 deep sternal wound culture both return positive for MRSA.

CBGB is monitored in your Monthly Reporting Plan. What gets reported to NHSN in your denominator data for this patient ?

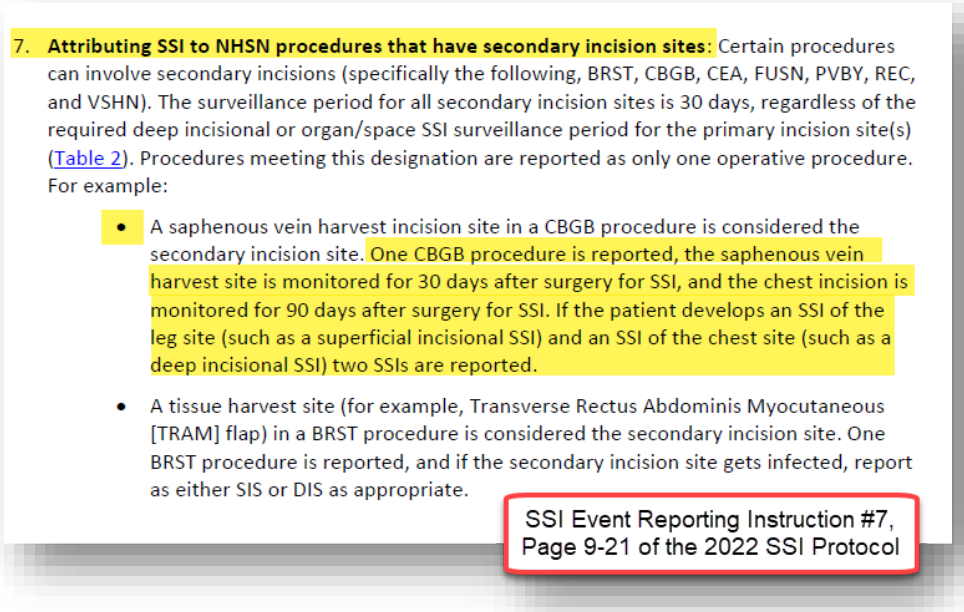
A. One CBGB procedure, procedure date of 1/2
B. Two CBGB procedures, procedure dates of 1/2
C. CBGB does not get reported since the patient went back to the OR for a mediastinal exploration within 24 hours of the finish time of the 1/2 CBGB and this ends the SSI surveillance period

Scenario #6 – Knowledge Check #14

A. One CBGB procedure, procedure date of 1/2

Rationale:

- One CBGB procedure is reported:
  - The saphenous vein harvest site has a 30-day SSI surveillance period
  - The chest incision has a 90-day SSI surveillance period



7. **Attributing SSI to NHSN procedures that have secondary incision sites:** Certain procedures can involve secondary incisions (specifically the following, BRST, CBGB, CEA, FUSN, PVBY, REC, and VSHN). The surveillance period for all secondary incision sites is 30 days, regardless of the required deep incisional or organ/space SSI surveillance period for the primary incision site(s) (Table 2). Procedures meeting this designation are reported as only one operative procedure. For example:

   - A saphenous vein harvest incision site in a CBGB procedure is considered the secondary incision site. One CBGB procedure is reported, the saphenous vein harvest site is monitored for 30 days after surgery for SSI, and the chest incision is monitored for 90 days after surgery for SSI. If the patient develops an SSI of the leg site (such as a superficial incisional SSI) and an SSI of the chest site (such as a deep incisional SSI) two SSIs are reported.
   - A tissue harvest site (for example, Transverse Rectus Abdominis Myocutaneous [TRAM] flap) in a BRST procedure is considered the secondary incision site. One BRST procedure is reported, and if the secondary incision site gets infected, report as either SIS or DIS as appropriate.

SSI Event Reporting Instruction #7, Page 9-21 of the 2022 SSI Protocol

Scenario #6 – Knowledge Check #14

A. One CBGB procedure, procedure date of 1/2

Rationale:

- The procedure start time for the mediastinal exploration is within 24 hours of the finish time of the CBGB, therefore Denominator Reporting Instruction #7 is applied.

- CBGB is reported.

Denominator Reporting Instruction #7, Page 9-25 of the SSI Protocol

7. **More than one operative procedure through same incision/surgical space within 24 hours:** When a patient has more than one operative procedure via the same incision or into the same surgical space and the second procedure start time is within 24 hours of the first procedure finish time, report only one *Denominator for Procedure* form for the original procedure, combining the durations for both procedures based on the procedure start times and finish times for both procedures. For example, a patient has a CBGB lasting 4 hours. He returns to the OR six hours later for another operative procedure via the same incision (for example, CARD). The second operation has duration of 1.5 hours. Record the operative procedure as one CBGB and the duration of operation as 5 hour 30 minutes. If the wound class has changed, report the higher wound class. If the ASA class has changed, report the higher ASA class. Do not report the CARD procedure in your denominator data.

Note: When the patient returns to the OR within 24 hours of the end of the first procedure assign the surgical wound closure technique that applies when the patient leaves the OR from the first operative procedure.

In terms of SSI, what gets reported?

A. One SSI event – SIP
B. One SSI event – DIP
C. Two SSI events – SIS and DIP
D. Two SSI events – SIS and SIP

Scenario #6 – Knowledge Check #15

C. Two SSI events – SIS and DIP

Rationale:

- The patient meets SIS criteria [secondary incision site]:
  - SSI-SIS criterion 'b' as MRSA identified from the secondary incision site

Superficial Incisional Secondary [SIS]

Surgical Site Infection (SSI)
Superficial incisional SSI
Must meet the following criteria:
Date of event 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
patient has at least ***one*** of the following:
a. purulent drainage from the superficial incision.
b. organism(s) 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 (for example, not Active Surveillance Culture/Testing (ASC/AST)).
c. superficial incision that is deliberately opened by a surgeon, physician* or physician designee and culture or non-culture based testing of the superficial incision or subcutaneous tissue is not performed **AND** patient has at least one of the following signs or symptoms: localized pain or tenderness; localized swelling; erythema; or heat.
d. diagnosis of a superficial incisional SSI by a physician* or physician designee.
* The term physician for the purpose of application of the NHSN SSI criteria may be interpreted to mean a surgeon, infectious disease physician, emergency physician, other physician on the case, or physician's designee (nurse practitioner or physician's assistant).

Scenario #6 – Knowledge Check #15

C. Two SSI events – SIS and DIP

Rationale:

- The patient meets DIP criteria [primary incision site]:
  - SSI-DIP criterion 'b' as a deep tissue level dehiscence, incisional pain and MRSA identified from the deep tissues of the primary incision site

Event Detail – Level of SSI After Cardiac Procedures

SSI FAQ

Q28. How do I determine the level of infection for the sternal site after cardiac procedures?

- Apply the superficial incisional SSI criteria if the infection involves the skin or subcutaneous tissue.
- Apply the deep incisional SSI criteria if the infection goes to the sternum but does not involve the bone.
- Apply the organ/space BONE criteria if the infection is of the sternal bone.
- Apply the organ/space MED – Mediastinitis criteria if the infection is below the sternum in the mediastinal space.

NOTE: If a patient meets both organ/space BONE and MED criteria report the SSI event as organ/space MED – Mediastinitis.

Deep Incisional Primary [DIP]

Deep incisional SSI

Must meet the following criteria:

The date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

AND

involves deep soft tissues of the incision (for example, fascial and muscle layers)

AND

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, physician* or physician designee

AND

organism(s) identified from the deep soft tissues of the incision by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing (ASC/AST)) or culture or non-culture based microbiologic testing method is not performed. A culture or non-culture based test from the deep soft tissues of the incision that has a negative finding does not meet this criterion.

AND

patient has at least ***one*** of the following signs or symptoms: fever (>38°C); localized pain or tenderness.

c. an abscess or other evidence of infection involving the deep incision that is detected on gross anatomical or histopathologic exam, or imaging test.

* The term physician for the purpose of application of the NHSN SSI criteria may be interpreted to mean a surgeon, infectious disease physician, emergency physician, other physician on the case, or physician's designee (nurse practitioner or physician's assistant).

Wrap Up

- The SSI protocol has its own definitions and criteria for SSI monitoring and reporting
- When monitoring an NHSN operative procedure category in your monthly reporting plan, the facility must follow the entire SSI protocol and report all SSIs for that procedure category. This includes superficial incisional, deep incisional and organ/space SSI events
- It is important to accurately apply denominator and numerator event details and reporting instructions when performing SSI surveillance
- Familiarize yourself with the SSI protocol and all supporting documents
  - A lot of excellent resources available to assist you with SSI surveillance
- Contact NHSN at nhsn@cdc.gov if having difficulty with a case determination. Please remember to provide all pertinent case details.

For any questions or concerns, contact the NHSN Helpdesk at nhsn@cdc.gov

For more information please contact Centers for Disease Control and Prevention
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