

NATIONAL HEALTHCARE SAFETY NETWORK SURGICAL SITE INFECTION (SSI)- SURVEILLANCE

Surveillance Definitions
Case Studies

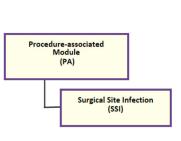


IMPORTANCE OF SSI SURVEILLANCE

- SSIs are a substantial cause of morbidity and mortality
 - · Prolonged hospitalizations
 - Increased costs
- The use of standardized SSI criteria applied in the same manner allows the use of data for epidemiological purposes
- Surveillance of SSI with feedback of data is important for prevention efforts and to reduce the risk of SSI
- Monitoring SSI events over time can help inform trends and quality improvement activities



CHAPTER 9-THE SSI PROTOCOL







NHSN OPERATIVE PROCEDURE



- ▶ Definition of an NHSN Operative Procedure:
 - Is included in the <u>ICD-10-PCS</u> or <u>CPT</u> 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 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

- ▶ Allows NHSN to standardize NHSN SSI surveillance reporting.
- Procedures are included in each of the 39 NHSN operative procedure categories based on operative procedure codes.
- NHSN uses ICD-10-CM/PCS & CPT operative procedure coding systems.
- Operative procedure codes are required to determine the correct NHSN operative procedure category to be reported (entry of codes into the NHSN application is optional but recommended).
 - Must use procedure code documents according to the date of procedure/protocol year.
 - Must include all qualifying procedures in the selected operative procedure categories indicated on the facility MRP.

IMPORTANT POINTS

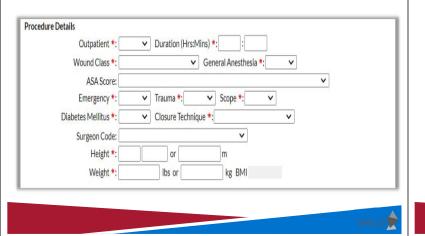


- ► The procedure date is the date when the NHSN operative procedure starts.
- ➤ The procedure date determines the protocol year to use with SSI surveillance (for 2023 procedures use the 2023 SSI protocol and guidance documents).
- ► For in-plan reporting purposes, only NHSN operative procedures are included in SSI surveillance and SSI events can only be attributed to NHSN operative procedures.
- NHSN does not mandate reporting —each facility decides what NHSN operative procedure categories to monitor within their MRP.





REQUIRED AND CONDITIONAL DATA POINTS



APPENDIX B: GUIDANCE FOR MULTIPLE PROCEDURE REPORTING



Appendix B added in 2023 to provide clarity and support to

Denominator Reporting Instruction #6: Same NHSN operative procedure category via separate incisions

- ▶ Operative Procedure Category
- Maximum # of Procedures Per Day
- Explanation

KNOWLEDGE CHECK

You include COLO-Colon Surgery and HYST-Abdominal Hysterectomy for monitoring on your facility MRP.

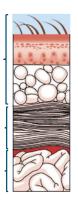
Question 1:

How should procedures be determined for inclusion into each selected procedure category?

- Review operative notes to determine which procedures to include
- Identify all qualifying procedures by use of assigned NHSN ICD-10-PCS/CPT procedure codes
- Identify all qualifying procedures by use of assigned NHSN ICD-10-PCD/CPT procedure codes-but only include those procedures in the denominator with subsequent SSI events

SSI: THREE TISSUE LEVELS SURGICAL SITE INFECTION CRITERIA

- ► Superficial Incisional
 - Skin and subcutaneous tissues of the incision
- Deep Incisional
 - Deep soft tissues of the incision
 - For example, muscle and fascia
- ▶ Organ/Space
 - ► Any part of the body deeper than the fascial/muscle layers





DEFINITIONS

► Superficial Incisional SSI Criteria:

- · Must meet the following criteria
 - DOE occurs within 30 after any NHSN operative procedure
 - Day 1 = procedure date

AND

Involves only skin and subcutaneous tissue of the incision



DEFINITIONS

► Superficial Incisional SSI Criteria cont.:

AND

- Patient has at least one of the following
 - a. Purulent drainage from the superficial incision.
 - Organisms identified from an aseptically obtained specimen from the superficial incision or subcutaneous tissue by a culture or non-culture based microbiologic testing.
 - Superficial incision that is deliberately opened by a surgeon, physician* or physician designee and culture or non-culture-based testing is not performed

AND

Patient has at least <u>one</u> of the following signs or symptoms: localized pain or tenderness, localized swelling, erythema, or heat.

Diagnosis of superficial incisional SSI by a physician* or physician designee





DEFINITIONS

► Superficial Incisional SSI Criteria Notes:

- ► Two specific types of superficial incisions SSIs
- 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 (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 one or more incisions (e.g., donor site for CBGB)



▶ Reporting Instructions for Superficial SSI

- A stitch abscess (minimal inflammation and discharge contained to the points of suture penetration) is not considered an SSI
- A localized stab wound, or pin site infection is not considered an SSI
 - · may be SKIN/ST infection
 - A laparoscopic trocar site is considered a surgical incision and not a stab
- Cellulitis, by itself, does not meet the criteria for superficial incisional SSI



KNOWLEDGE CHECK

- 11/1 Mr. Wall is admitted for a spinal fusion.
- 11/4 patient discharged
- 11/20 on post-op visit patient noted to have redness and swelling of the superficial incision. The wound is not cultured nor probed. The patient is given antibiotics and sent home.

Does this meet the superficial SSI definition?

11/29 Mr. Wall presents to the Emergency room with purulent drainage from the superficial incision. The wound is cultured and grows MRSA. Patient is given antibiotics and discharged home.

Does the patient meet the superficial SSI definition?



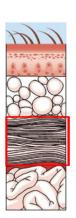
DEFINITIONS

► Deep Incisional SSI Criteria:

- Must meet the following criteria
 - DOE occurs within 30 or 90 days after any NHSN operative procedure according to the list in Table 2 in Chapter 9
 - Day 1 = procedure date

AND

- · Involves deep soft tissues of the incision
 - For example, fascial and muscle layers





DEFINITIONS

► Deep Incisional SSI Criteria cont:

AND

- Patient has at least one of the following:
 - Purulent drainage from the deep incision
 - Deep incision spontaneously dehisces or is deliberately opened or aspirated by a surgeon, **physician** or physician designee** and is **culture-positive or not cultured**. <u>A culture-negative finding</u> does not meet this criterion.

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

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

DEFINITIONS

▶ Deep Incisional SSI Criteria Notes:

- ► Two specific types of deep incisions SSIs
- ► Deep incisional primary (DIP)
 - A deep incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (chest incision for CBGB)
- ► Deep incisional secondary (SIS)
 - A deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with one or more incisions (e.g., donor site for CBGB)





DEFINITIONS

► Organ/Space SSI Criteria:

- · Must meet the following criteria
 - · DOE occurs within 30 or 90 days after any NHSN operative procedure according to the list in Table 2 in Chapter 9
 - Day 1 = procedure date

AND

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



DEFINITIONS

► Organ/Space SSI Criteria cont.:

AND

- · Patient has at least one of the following:
 - 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
 - Organism(s) identified from fluid or tissue in the organ/space by a culture or non-culture based microbiologic testing method
 - An abscess or other evidence of infection involving the organ/space that is detected on **gross anatomical** or histopathologic exam, or imaging test evidence definitive or equivocal for infection.

Meets at least one criterion for a specific organ/space infection site listed in Table 3. Criteria can be found in the Surveillance Definitions for Specific Types of Infections, Chapter 17





Criteria can be found in the **Surveillance Definitions for Specific Types** of Infections, **Chapter 17**

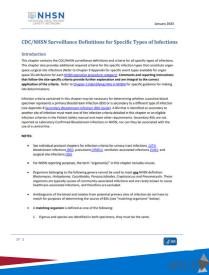


Table 3. Specific Sites of an Organ/Space SS

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		

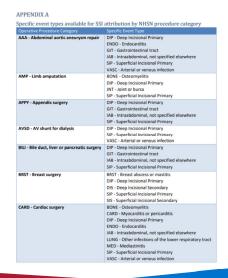
(Criteria for these sites can be found in Chapter 17 (Surveillance Definitions for Specific Types of

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



► Specific Event Types **Available for SSI** Attribution by **Operative Procedure** Code: Chapter 9 **Appendix**

SSI event reporting is limited to the following specific event types for each procedure category



SSI-PROCEDURE-ASSOCIATED MODULE

- ▶ Chapter 2 terms not applicable to SSI:
 - ► Infection window period (IWP)
 - ▶ Present POA) Healthcare ed infection

 - ► (HAI)
 - ► Repeat infection timeframe (RIT)
- ►SSI protocol uses terms:
 - ▶ Date of Event (DOE)
 - ► Secondary BSI Attribution Period



THE SSI EVENT: IMPORTANT POINTS

- ► Must collect SSI event (numerator) data on all procedures included in the selected operative procedure categories indicated on the facility's MRP
 - ▶ All procedures are monitored for superficial incisional, deep incisional, and organ/space SSI events and the type of SSI reported must reflect the deepest tissue level where SSI criteria are met during the surveillance period.
- Events meeting SSI criteria are reported to NHSN regardless of noted evidence of infection at time of surgery (there is no such thing as "POA" or 'ongoing' infection in SSI surveillance
- ► An SSI event is attributed to the facility where the NHSN operative procedure is performed.



► Surveillance Period for SSI:

- The surveillance period is determined by the NHSN operative procedure category
- Superficial incisions are only followed for a 30-day period for all procedure types
- Depending on the procedure category there may be a 30day or 90-day surveillance period for deep or organs space SSI.
- Secondary incisional SSIs are only followed for a 30-day period regardless of the primary site surveillance period.

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 Sur	veillance			
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				



SSI EVENT DETAIL: 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.
 - ▶ DOE must occur within appropriate 30- or 90-day SSI surveillance period.
 - ▶ The type of SSI reported, and the DOE assigned must reflect the deepest tissue level where SSI criteria are met during the surveillance
 - Example: COLO performed
 - ▶ Meets SIP-SSI with DOE on day 8 of surveillance period.
 - Meets DIP-SSI with DOE on day 21 of surveillance period.
 - ▶ DIP-SSI reported with DOE as day 21 attributed to the COLO.

SSI EVENT DETAIL: TIMEFRAME FOR SSI ELEMENTS

- ▶ The concept of infection window period (IWP) is not applicable to SSI surveillance. There are surveillance periods defined by the procedure category.
- 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 all elements associate to the SSI, elements must occur in a relatively
- ▶ tight timeframe.
 - **Example**: An element on day 5 of the surveillance period with another element three weeks later should not be used to cite an SSI.
- Cases differ based on elements that occur and type of SSI under consideration

SSI EVENT DETAIL:

SECONDARY BSI SCENARIOS FOR SSI



SSI EVENT DETAIL: 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.

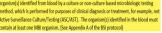
SSI **Secondary BSI Attribution Period** 3 days before DOE + DOE 13 days after DOE



► 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.

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' minal infections must meet at least <u>one</u> of the following criteria:

- Patient has organism(s) Identified from an abscess or from purulent material from intraabdomin 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).
 - Patient has at least one of the following:
 - a. abscess or other evidence of intraabdominal infection on gross anatomic or histopathologic







SSI EVENT DETAIL: GROSS ANATOMICAL EXAM



- Evidence of infection elicited or visualized on physical examination or observed during an invasive procedure.
- 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.

SSI EVENT DETAIL: GROSS ANATOMICAL EXAM



- SSI: Abdominal pain or tenderness <u>cannot</u> be applied as "<u>other evidence of infection on gross anatomic</u> <u>exam</u>" to meet Deep Incisional SSI criterion 'c' or to meet any Chapter 17 site-specific (for example, OREP
- Imaging test evidence of infection cannot be applied to meet gross anatomic evidence of infection
 - Imaging test evidence has distinct findings in the NHSN definitions (for example, IAB '3b')

ICE

SSI EVENT DETAIL: PURULENCE

- NHSN does not define purulence, as there is no standard, clinically agreed upon definition
 - · The descriptors "pus" or "purulence" are sufficient evidence
- Drainage using a color descriptor <u>AND</u> a consistency descriptor (as long as combined) are acceptable to indicate purulence:
 - · Color: green, yellow
 - Consistency: milky, thick, creamy, opaque, viscous
- Example: 'thick yellow' drainage acceptable to indicate purulence
- Gram stain results (WBCs or PMNs) cannot be used to define purulence

SSI EVENT REPORTING

- ▶ Present at time of Surgery (PATOS):
 - Denotes that there is evidence of an infection visualized (seen) during the operative procedure to which the SSI is attributed.
 - The evidence of infection must be noted intraoperatively and documented within the narrative portion of the operative note or report of surgery (commonly labeled the 'procedure in detail' or 'description of procedure's section)
 - Pre/post op diagnoses, 'indication for surgery' NOT surgical narrative.
 - PATOS is tissue level specific meaning the documented infection must be at the same tissue level of the subsequent SSI.
 - Pathology findings, culture results, wound classification, trauma status, and imaging test findings cannot be used for PATOS determination.
 - Traumas resulting in a contaminated case does not necessarily meet PATOS.



PATOS

- Examples that indicate evidence of infection may include:
 - Abscess, infection, purulence, phlegmon, or "feculent peritonitis".
 - A ruptured/perforated appendix is evidence of infection at the organ/space level
- Examples of verbiage that is not considered evidence of infection include but are not limited to:
 - colon perforation, contamination, necrosis, gangrene, fecal spillage, nicked bowel during procedure, or a note of inflammation.
- The use of the ending "it is" in an operative note does not automatically meet PATOS, as it may only reflect inflammation.
 - $\bullet \quad \textit{Examples: diverticulitis, peritonitis, appendicitis.} \\$

SSI EVENT REPORTING

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
 - 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)
 - An infection subsequently develops in a tissue level which was entered during the manipulation/accession



SSI EVENT REPORTING

- ➤ SSI attribution after multiple types of NHSN procedures are performed during a single trip to the OR:
 - Attribute the SSI to the procedure that is thought to be associated with the infection.
 - If it is not clear, use the NHNS
 Principal Operative Procedure
 Category Selection Lists to select
 the operative procedure to
 attribute the SSI.

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	

RESOURCES

- On-Demand Video: 'Patient Safety Component Navigating SSI Reporting in NHSN'
- ► Content covered
 - ► Identify surveillance methods
 - Demonstrate how to locate Surgical Site Infection (SSI) resources on the NHSN website
 - Review reporting requirements for Monthly Reporting Plans (MRPs), numerator and denominator data





RESOURCES

- ► NHSN Surgical Site Infection (SSI) Events webpage https://www.cdc.gov/nhsn/psc/ssi/index.html
- ► Patient Safety Component Manual Chapter 9: 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



QUESTIONS



