



The Devil is in the Details: Applying SSI Criteria Accurately

Kathy Allen-Bridson RN, BSN, CIC
Nurse Consultant

Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

February, 2011

SAFER • HEALTHIER • PEOPLE™



Objectives

1. State the locations of the necessary tools to correctly identify surgical site infections (SSI).
2. Identify the basic tenets of applying surveillance definitions.
3. State the Centers for Disease Control and Prevention's definitions and criteria of SSI.



Objectives

4. State the correct method to identify denominators for SSI rate calculations
5. Utilize the NHSN healthcare-associated infections criteria and definitions to correctly identify SSIs when applied to case studies

Centers for Medicare and Medicaid Hospital Inpatient Quality Reporting Program

*Hospitals that do not participate in NHSN SSI surveillance will receive a reduction of **2.0 percent** in their Medicare Annual Payment Update for fiscal year 2012*





Hospital Inpatient Quality Reporting Program

- Tentative requirements for SSI reporting:
- Procedures occurring after January 1, 2012??
- The Joint Commission's SCIP (Surgical Care Improvement Project) core measurement set

AAA

HPRO

REC

CBGB & CBGC

HYST

VHYST

CARD

KPRO

COLO

PVBY



NHSN Website

- NHSN Manual
 - Criteria
 - Key Definitions
 - Tables of Instructions
- Data and Statistics
 - NHSN published reports
- Trainings
- NHSN forms
- Lots more!!!

<http://www.cdc.gov/nhsn/index.html>

National Healthcare Safety Network (NHSN)

The National Healthcare Safety Network (NHSN) is a voluntary, secure, internet-based surveillance system that integrates and expands legacy patient and healthcare personnel safety surveillance systems managed by the Division of Healthcare Quality Promotion (DHQP) at CDC. NHSN also includes a new component for hospitals to monitor adverse reactions and incidents associated with receipt of blood and blood products. Enrollment is open to all types of healthcare facilities in the United States, including acute care hospitals, long term acute care hospitals, psychiatric hospitals, rehabilitation hospitals, outpatient dialysis centers, ambulatory surgery centers, and long term care facilities. For more information, click on the topics below.




Replay  Join NHSN


HA: Recovery Act


Biovigilance Component

NHSN Biovigilance Component **GO»**

Text size: [S](#) [M](#) [L](#) [XL](#)

 [Email page](#)

 [Print page](#)

 [Bookmark and share](#)



Topics


- About NHSN**
Overview, Purposes, Confidentiality statement, How data are used, External Peer Review report...
- Enrollment Requirements**
Eligibility, Required Training, Reporting & System Requirements, Security, Begin Enrollment...
- Forms**
Component-specific manuals containing data collection protocols, instructions for completing forms...
- Training**
Self-study slide sets and corresponding materials for NHSN modules...
- NHSN Manuals**
Component-specific manuals containing data collection protocols, instructions for completing forms...
- Patient Safety Component**
Overview of the Modules: Device-associated, Procedure-associated, MDRO/CDAD, Vaccination...

Vaccination Module Update

The HRIIV Module is being replaced with the **Updated Vaccination Module**. Please check back in a few weeks.

Data & Statistics




 **Get email updates**

To receive email updates about NHSN, enter your email address:

[What's this?](#)

Contact NHSN:

 Centers for Disease Control and Prevention



National Healthcare Safety Network (NHSN)

NHSN

[Join NHSN](#)[About NHSN](#)[Communication Updates](#)[Enrollment Requirements](#)[Patient Safety Component](#)[Healthcare Personnel Safety Component](#)[Biovigilance Component](#)[Data Collection Forms](#)[Training](#)[Data & Statistics](#)[Resource Library](#)[Clinical Document Architecture](#)[NHSN Manuals](#)**[Patient Safety Manual](#)**[Healthcare Personnel Safety Manual](#)[Biovigilance Manual](#)[Contact NHSN](#)**FAQs About...**

- [NHSN](#)
- [CMS Hospital Inpatient Quality Reporting Program](#)
- [New NHSN agreement](#)
- [Enrollment](#)
- [Security](#)
- [Digital Certificates](#)

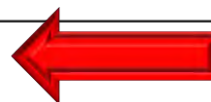
[NHSN > NHSN Manuals](#)

NHSN Patient Safety Component Manual

Vaccination Module Update


The **HRIIV Module** is being replaced with the **Updated Vaccination Module**. Please check back in a few weeks.

| Chapter | Title |
|------------------------------------|--|
| 1 | NHSN Overview [PDF - 52KB] April 2010. |
| 2 | Identifying Healthcare-associated Infections (HAIs) in NHSN [PDF - 84KB] March 2009. |
| 3 | Patient Safety Monthly Reporting Plan [PDF - 26KB] November 2009. |
| Device-Associated Module | |
| 4 | Central Line-Associated Bloodstream Infection (CLABSI) Event [PDF - 169KB] Guidelines and procedures for monitoring CLABSI. June 2010. |
| 5 | Central Line Insertion Practices (CLIP) Adherence [PDF - 82KB] Guidelines and procedures for monitoring CLIP. January 2010. |
| 6 | Ventilator-Associated Pneumonia (VAP) Event [PDF - 242KB] Guidelines and procedures for monitoring VAP March 2009. |
| 7 | Catheter-Associated Urinary Tract Infection (CAUTI) Event [PDF - 236KB] Guidelines and procedures for monitoring CAUTI. March 2009. |
| 8 | Dialysis Event [PDF - 53KB] Guidelines and procedures for monitoring. February 2010. |
| Procedure-Associated Module | |
| 9 | Surgical Site Infection (SSI) Event [PDF - 258KB] Guidelines and procedures for monitoring SSI. June 2010 |
| | Post-Procedure Pneumonia (PPP) Event [PDF - 36KB] |

Text size: [S](#) [M](#) [L](#) [XL](#)[Email page](#)[Print page](#)[Bookmark and share](#)**Get email updates**

To receive email updates about NHSN, enter your email address:

[What's this?](#)**Contact NHSN:**

 Centers for Disease Control and Prevention
National Healthcare Safety Network
MS-A24
1600 Clifton Rd
Atlanta, GA 30333

nhsn@cdc.gov[More contact info >>](#)



Surgical Site Infection (SSI) Event

Introduction: In 2002, in the United States, an estimated 14 million NHSN operative procedures were performed (CDC unpublished data). Among the “big four” healthcare-associated infections (i.e. PNEU, SSI, UTI, BSI) SSIs were the second most common healthcare-associated infection, accounting for 17% of all HAIs among hospitalized patients¹. A similar rate was obtained from NHSN hospitals reporting data in 2006-2008 (15,862 SSI following 830,748 operative procedures) (CDC, unpublished data) with an overall rate of nearly 2%.¹

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 and mortality among hospitalized patients. In one study, among nearly 100,000 HAIs reported in one year, deaths were associated with SSIs in more than 8,000 cases.²

Surveillance of SSI with feedback of appropriate data to surgeons has been shown to be an important component of strategies to reduce SSI risk.^{3,4,5,6,7} A successful surveillance program includes the use of epidemiologically sound infection definitions and effective surveillance methods, stratification of SSI rates according to risk factors associated with SSI development, and data feedback.^{4,5} Recommendations are outlined in the CDC’s *Guideline for Prevention of Surgical Site Infection, 1999*.⁷

Settings: Surveillance will occur with surgical patients in any inpatient/outpatient setting where the selected NHSN operative procedure(s) are performed.

Requirements: Select at least one NHSN operative procedure (Table 1) and indicate the selected procedure on the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Collect numerator and denominator data on all selected procedures for at least one month.

The *International Classification of Diseases, 9th Revision Clinical Modifications* (ICD-9-CM) codes, which are defined by the ICD-9 Coordination and Maintenance Committee of the National Center for Health Statistics and the Centers for Medicare and Medicaid Services (CMS), are developed as a tool for classification of morbidity data. The preciseness of the data, as well as their



CDC/NHSN Surveillance Definition of Healthcare-Associated Infection and Criteria for Specific Types of Infections in the Acute Care Setting

What follows are the NHSN criteria for all healthcare-associated infections (HAIs). These criteria include those for the “Big Four” (surgical site infection [SSI], pneumonia [PNEU], bloodstream infection [BSI] and urinary tract infection [UTI]), outlined in earlier chapters of this NHSN manual, as well as criteria for other types of HAIs. Of particular importance, this chapter provides further required criteria for the specific event types that constitute organ/space SSIs (e.g. mediastinitis [MED] following coronary artery bypass graft, intra-abdominal abscess [IAB] following colon surgery, etc.).

NOTE: The article which is included does not include the updated criteria for UTI which became effective beginning in January, 2009. Instead these criteria are included in the pages that follow the article. Please use these definitions in your NHSN surveillance.

NOTE: As of January 1, 2010, Clinical Sepsis (CSEP) is no longer an NHSN Specific Event for BSI. Please disregard the information included on page 316 regarding CSEP, and do not report such events in NHSN. The definitions will be updated with the next

Horan TC, Andrus ML, Dudeck MA. CDC/NHSN surveillance definition of healthcare-associated infection and criteria for specific types of infections in the acute care setting. *Am J Infect Control* 2008;36:309-32.

<http://www.cdc.gov/ncidod/dhqp/pdf/NNIS/NosInfDefinitions.pdf>

Tenets of Surveillance



Surveillance vs. clinical definitions



- Different purposes
- May not agree
- Comments section useful to note important factors

Can submit questions to NHSN mailbox
NHSN@cdc.gov



Tenets of Surveillance



Consistency is a Must!

- Criteria designed to look at a population at risk
- Identify patients meeting the criteria
- Consistently apply the criteria
- Ensures the comparability of the data- protects your facility and others



Definitions





Healthcare-associated Infection (HAI)

- A localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that
 - Occurs in a patient in a healthcare setting and
 - Was not present or incubating at the time of admission, unless the infection was related to a previous admission



HAI

- The following conditions are not infections:
 - Colonization (presence of microorganisms on skin, mucous membranes, in open wounds, or in excretions or secretions but are not causing adverse clinical signs or symptoms)
 - Inflammation that results from tissue response to injury or stimulation by noninfectious agents, such as chemicals



NHSN Operative Procedure Includes:



- Surgery completed in a single trip to the OR
- ★ ■ Incision closed before leaving OR
- Surgery conducted in defined operating room suite
- May be an in- or out-patient procedure
- Laparoscopic & traditional approaches included

Ensure your denominator is correct



Definition of an Operating Room

- A patient care area that meets the American Institute of Architects (AIA) criteria for an operating room. This may include an operating room, C-Section room, interventional radiology room, or a cardiac catheterization lab.



NHSN Operative Procedure Categories*

- Each NHSN Operative Procedure category consists of a group of ICD-9-CM codes

Example: CBGB (CABG with chest and donor site incisions) = ICD-9 codes 36.10 – 36.14, 36.19

- When monitoring a specific NHSN Operative Procedure category, all the ICD-9 codes within that category that are done in your facility must be followed

*Table 11 in the *NHSN Patient Safety Component Protocol* document



Implant

- A nonhuman-derived implantable foreign body (e.g., prosthetic heart valve, hip prosthesis) that is permanently placed in a patient during an NHSN operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes
- Screws, wires, and mesh that are left in place are considered implants (staples are also considered implants). This list is not all inclusive.



Non- Autologous Transplant



- Transplant: Human cells, tissues, organs, or cellular- or tissue-based products that are placed into a human recipient via grafting, infusion, or transfer. Examples include: heart valves, organs, ligaments, bone, blood vessels, skin, corneas, and bone marrow cells.
- Autologous or “autograft” transplants are products that originate from the patient’s own body.
- Non-autologous or “allograft” transplants are tissues or other products derived from another human body, either a donor cadaver or a live donor.



Transplant

- REPORTING INSTRUCTIONS:
- Some products are a combination of human- and nonhuman-derived materials, such as demineralized human bone matrix with porcine gel carrier. When placed in a patient during an operative procedure, indicate “Yes” for both the Implant and Non-autologous Transplant fields.
- Some operative procedures involve placement of both autologous and non-autologous products. For these procedures, indicate “Yes” for Non-autologous Transplant field.



Superficial Incisional SSI

A superficial incisional SSI must meet one of the following criteria:

Infection occurs within 30 days after the operative procedure
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. organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
- c. at least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat, and superficial incision is deliberately opened by surgeon, and is culture-positive or not cultured. A culture-negative finding does not meet this criterion.
- d. diagnosis of superficial incisional SSI by the surgeon or attending physician.

Superficial Incisional SSI

NOTE: There are two specific types of superficial incisional SSIs:

1. 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 (e.g., C-section incision or chest incision for CBGB)
2. 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 (e.g., donor site [leg] incision for CBGB)

REPORTING INSTRUCTIONS:

- Do not report a stitch abscess (minimal inflammation and discharge confined to the points of suture penetration) as an infection.
- Do not report a localized stab wound infection as SSI. While it would be considered either a skin (SKIN) or soft tissue (ST) infection, depending on its depth, it is not reportable under this module.
- “Cellulitis”, by itself, does not meet the criteria for Superficial Incisional SSI.
- If the incisional site infection involves or extends into the fascial and muscle layers, report as a deep-incisional SSI.
- Classify infection that involves both superficial and deep incision sites as deep incisional SSI.
- An infected circumcision site in newborns is classified as CIRC. Circumcision is not an NHSN operative procedure. CIRC is not reportable under this module.
- An infected burn wound is classified as BURN and is not reportable under this module

Deep Incisional SSI



A deep incisional SSI must meet one of the following criteria:

Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure

and

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

and

patient has at least one of the following:

- a. purulent drainage from the deep incision but not from the organ/space component of the surgical site
- b. a deep incision spontaneously dehisces or is deliberately opened by a surgeon and is culture-positive or not cultured when the patient has at least one of the following signs or symptoms: fever ($>38^{\circ}\text{C}$), or localized pain or tenderness. A culture-negative finding does not meet this criterion.
- c. an abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination
- d. diagnosis of a deep incisional SSI by a surgeon or attending physician.



Organ/Space SSI

- An organ/space SSI involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure.
- Specific sites are assigned to organ/space SSI to further identify the location of the infection (Table 2).

Specific Sites of Organ/Space SSI



Table 2. Specific sites of an organ/space SSI. Criteria for these sites can be found in the NHSN Help Messages (must be logged in to NHSN) or Chapter 17.⁸

| Code | Site | Code | Site |
|------|---|------|---|
| BONE | Osteomyelitis | LUNG | Other infections of the respiratory tract |
| BRST | Breast abscess or mastitis | MED | Mediastinitis |
| CARD | Myocarditis or pericarditis | MEN | Meningitis or ventriculitis |
| DISC | Disc space | ORAL | Oral cavity (mouth, tongue, or gums) |
| EAR | Ear, mastoid | OREP | Other infections of the male or female reproductive tract |
| EMET | Endometritis | OUTI | Other infections of the urinary tract |
| ENDO | Endocarditis | SA | Spinal abscess without meningitis |
| EYE | Eye, other than conjunctivitis | SINU | Sinusitis |
| GIT | GI tract | UR | Upper respiratory tract |
| IAB | Intraabdominal, not specified elsewhere | VASC | Arterial or venous infection |
| IC | Intracranial, brain abscess or dura | VCUF | Vaginal cuff |
| JNT | Joint or bursa | | |



Specific Sites of Organ/Space SSI

- **Specific sites of organ/space (Table 2) have specific criteria which must be met in order to qualify as an NHSN event. These criteria are in addition to the general criteria for organ/space and can be found in Chapter 17.**

Organ/Space SSI

An organ/space SSI must meet the following criterion:

Infection occurs within 30 days after the operative procedure if no implant¹ is left in place or within 1 year if implant is in place and the infection appears to be related to the operative procedure

and

infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure


and

patient has at least 1 of the following:

- a. purulent drainage from a drain that is placed through a stab wound into the organ/space
- b. organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space
- c. an abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination
- d. diagnosis of an organ/space SSI by a surgeon or attending physician.



Organ/Space SSI

- 
- Occasionally an organ/space infection drains through the incision. Such infection generally does not involve reoperation and is considered a complication of the incision. Therefore, classify it as a deep incisional SSI.
 - Report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as SSI-MED rather than SSI-BONE.
 - Report CSF shunt infection as SSI-MEN if it occurs \leq 1 year of placement; if later or after manipulation/access, it is considered CNS-MEN and is not reportable under this manual.
 - Report spinal abscess with meningitis as SSI-MEN following spinal surgery.

Organ/Space SSI

- If a patient has several NHSN operative procedures prior to an infection, report the operative procedure code of the operation that was performed most closely in time prior to the infection date, unless there is evidence that the infection is associated with a different operation.
- 2. If more than one NHSN operative procedure was done through a single incision, attempt to determine the procedure that is thought to be associated with the infection. If it is not clear (as is often the case, such as when the infection is a superficial incisional SSI), use the NHSN Principal Operative Procedure Selection Lists (Table 3) to select which operative procedure to report.

Table 3. NHSN Principal Operative Procedure Selection Lists

The following lists are derived from Table 1, NHSN Operative Procedure Categories. The operative procedures with the highest risk of surgical site infection are listed before those with a lower risk.

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

Entering Procedure Data (1)

1. *Manual*
2. *Electronic Import*

Importing Patient Safety Procedure Data

The NHSN will allow importation of procedure data in an ASCII comma delimited text file format. You can generate the import files from different external sources, such as databases or hospital information systems. The default import option allows the importation of procedures where the procedure date occurs in a month for which a Monthly Reporting Plan exists and the Plan specifies the procedure code in the import file record. If you wish to import records for procedures not in the Plan, you must specify which procedures to include.

Custom procedures can also be imported if they are first created on the custom options page.

NOTES:

1. Data in the import file must be in the same order as described in the table below, not as they appear on the Denominator for Procedure form.
2. The comma delimited text file format defined in the below table requires commas between fields even if no data values exist (e.g., optional or empty fields).
3. If a bilateral procedure is performed, two procedure records are required. Refer to the NHSN Procedure Codes table for a list of procedures that can be bilateral.
4. There should be a unique duration for each bilateral procedure. If only one total time is available for both procedures, estimate the duration for each or split the time evenly between them.
5. For procedures, if Outpatient = Y, then the procedure must be one of those listed in the NHSN Procedure Codes table as an Outpatient Procedure.
6. If you are importing Surgeon Code, all surgeon codes must exist in NHSN prior to importing.
7. If the optional Procedure Comment field has text that contains commas you must place a double quote at the beginning and end of the string of text (e.g., with allograft, dowels, plates).
8. When creating comma delimited files, be careful to exclude non-printable characters as they may actually cause the data to be improperly imported and result in errors.
9. You must delete the header line from the CSV file prior to importing the data.
10. Fields marked as "Optional for Import" allow an incomplete record to be imported. Note that these fields are considered required for completion of an in-plan procedure record and can be completed through manual edit of each record in the NHSN reporting application.

Entering Procedure Data (2)



- 1. If more than one NHSN operative procedure (category) is performed during the same trip to the OR, a Denominator for Procedure (CDC 57.121) record is reported for each operative procedure being monitored. Even if more than one NHSN operative procedure (category) is done through the same incision (e.g., CARD and CBGC), a Denominator for Procedure record is reported for each.
- EXCEPTIONS:
 - If a patient has both a CBGC and CBGB during the same trip to the OR, report only as a CBGB.
 - If patient has a LAM as an approach to FUSN, record only FUSN

*Ensuring your
denominator data
is correct*

Entering Procedure Data (3)



- If more than one NHSN operative procedure is performed through the same incision, record the combined duration of all procedures, which is the time from skin incision to primary closure
- For bilateral operative procedures (e.g., KPRO), two separate Denominator for Procedure (CDC 57.121) are completed. To document the duration of the procedure, indicate the incision time to closure time for each procedure separately or, alternatively, take the total time for both procedures and split it evenly between the two

*Ensuring your
denominator data
is correct*



Entering Procedure Data (4)

- If a patient goes to the OR more than once during the same admission and another procedure is performed through the same incision within 24 hours of the original operative incision, report only one procedure on the Denominator for Procedure (CDC 57.121) combining the durations for both procedures

*Ensuring your
denominator data
is correct*



SSI Case Studies



Case 1



- Patient is admitted to the hospital on 04/12 for elective surgery and active MRSA screening test is positive.
- On the same day, patient undergoes small bowel resection (SB).
- Postoperative course is unremarkable and patient discharged on 4/16.
- On 4/30, you receive notice from another hospital that on 4/29 the patient was admitted to that facility with a red, angry wound. Medical staff opened the incision to the fascial level and cultured the wound. The culture was positive for MRSA.

Case 1



Is this possible infection considered healthcare-associated?

If so, what type?

If so, to which facility is it attributed?

If so, what is the date of onset?



Case 1



Is this possible infection considered healthcare-associated?

Yes. Preoperative colonization does not prevent an infection from being healthcare associated.

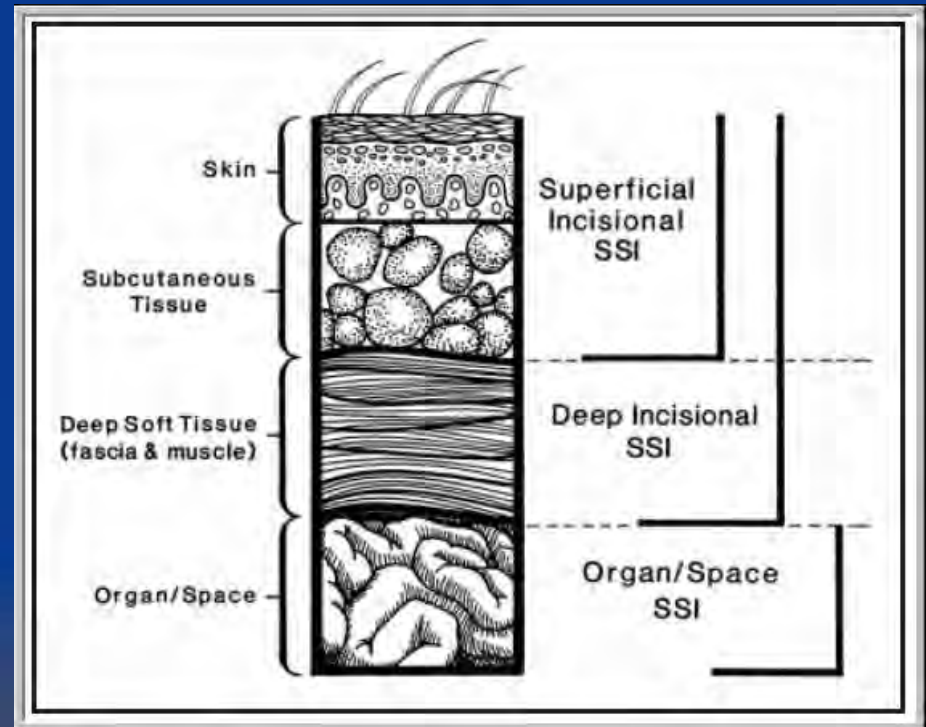
Case 1



If so, what type?

Superficial

Incisional Primary



Case 1



If so, to which facility is it attributed?

SSIs are always attributed to the facility in which they were performed. Therefore this will be attributed to your facility and in this case was identified by post discharge surveillance.

Location:

Date Admitted to Facility:

Risk Factors

Event Details [HELP](#)

Specific Event:

Detected:

Secondary Bloodstream Infection:

Died**:

Discharge Date:

Pathogens Identified: If Yes, specify below ->

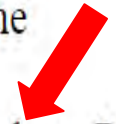
Secondary Bloodstream Infection dropdown options:

- A - Admission
- P - Postdischarge surveillance
- R - Readmission



Case 1

| | |
|----------------------------|---|
| | own unique criteria which must be met. They are found in Table 17. |
| Event details: Detected | Required. Check A if SSI was identified before the patient was discharged from the facility following the operation. Check P if SSI was identified during post-discharge surveillance. Include as P those SSI identified by another facility (i.e., patient with SSI was admitted to a facility other than the one in which the operation was performed). Check R if SSI was identified due to patient readmission to the facility where the operation was done. |



http://www.cdc.gov/nhsn/PDFs/pscManual/14_Tables_of_Instructions.pdf

Case 1



If so, what is the date of onset?

*4/29 or first
symptom*





Case 2

- Jane Doe, a 14 year-old girl, had a spinal fusion (FUSN) performed on 1/22
- 2/1: Increased back pain; Temp 38°C
- 2/2: MRI reveals abscess in the spinal epidural space. Empiric antibiotics begun.
- 2/3: Surgeon opens wound in the OR & drains abscess; specimen to lab for culture; OR notes „infected hematoma”
- 2/5: Culture positive for *Pseudomonas aeruginosa*

Case 2

- Is this an SSI?

Yes

- If so, what type?

Organ/Space SSI

Specific Type:

*SA Spinal abscess
without meningitis*

SA-Spinal abscess without meningitis

An abscess of the spinal epidural or subdural space, without involvement of the cerebrospinal fluid or adjacent bone structures, must meet at least 1 of the following criteria:

1. Patient has organisms cultured from abscess in the spinal epidural or subdural space.
2. Patient has an abscess in the spinal epidural or subdural space seen during a surgical operation or at autopsy or evidence of an abscess seen during a histopathologic examination.
3. Patient has at least 1 of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}\text{C}$), back pain, focal tenderness, radiculitis, paraparesis, or paraplegia
and
at least 1 of the following:
 - a. organisms cultured from blood
 - b. radiographic evidence of a spinal abscess (eg, abnormal findings on myelography, ultrasound, CT scan, MRI, or other scans [gallium, technetium, etc]).*and*
if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy.

Reporting instruction

- Report spinal abscess *with* meningitis as MEN.

Case 2 (Cont).



- Let's say that a culture of the CSF collected at the time of reop also was found to be positive for *Pse. Aer.* Does this change the type of SSI?

Yes! SSI-MEN

MEN-Meningitis or ventriculitis

Meningitis or ventriculitis must meet at least 1 of the following criteria:

- ✓ 1. Patient has organisms cultured from cerebrospinal fluid (CSF).
2. Patient has at least 1 of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}\text{C}$), headache, stiff neck, meningeal signs, cranial nerve signs, or irritability

and
at least 1 of the following:

- a. increased white cells, elevated protein, and/or decreased glucose in CSF
- b. organisms seen on Gram's stain of CSF
- c. organisms cultured from blood
- d. positive antigen test of CSF, blood, or urine
- e. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen

and

if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy.

3. Patient ≤ 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}\text{C}$), headache, irritability,

****Reporting Instructions****

For a shunt infection as SSI-MENYI
 ≤ 1 year of placement; if later or after manipulation/access of the shunt, report as CNS-MEN.

Report meningoencephalitis as MEN.

- Report spinal abscess with meningitis as MEN.



Case 2



- Let's also say that the patient had a laminectomy (LAMI) done as an approach to the FUSN.
- If you are participating in SSI surveillance for both LAM and FUSN, what procedure(s) would be included in your surgical denominators?

FUSN only. Laminectomies performed as an APPROACH to FUSN should not be coded as a separate LAMI. (Coding rule, not NMSN rule)




Case 3

- 4/8: John Smith had a tunneled central line placed in the OR, due to failure of a hemodialysis fistula. He was discharged and continued on outpatient hemodialysis using the line.
- 8/22: JS readmitted with redness and purulent discharge at the insertion site. Blood cultures are negative.



Case 3

- Would this be an SSI?
- Why or why not?



No. Because the device has been manipulated for therapeutic purposes, it is no longer an implant. Therefore any SSI must develop within 30 days of the surgery.

Implant

A nonhuman-derived object, material, or tissue that is permanently placed in a patient during an operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes. Examples include: porcine or synthetic heart valves, mechanical heart, metal rods, mesh, sternal wires, screws, cements, and other devices.



Case 3

- If in addition to the signs/ symptoms listed, the blood culture was positive for MSSA, would this be called a BSI attributed to your facility?



Case 3

- *No. CDC/NHSN device-associated criteria (except Dialysis Events) are for inpatients only. It cannot be called a CLABSI within NHSN because all NHSN CLABSIs are healthcare-associated, not community-associated.*
- *The event may be reported through the NHSN DE module if your facility is participating in that module and the patient was receiving hemodialysis in one of your facility's outpatient dialysis units (vascular access infection).*



Case 4

- A 66-year-old woman is admitted on Sept 10th as an inpatient, having recently noticed blood in her stools. Diagnostic investigation reveals a colon carcinoma.
- 9/11: Hemicolectomy performed.
- 9/13: Temperature up to 38.7°C, abdominal pain. Loculated fluid collection per U/S.



Case 4

- 9/14: I&D of intraabdominal fluid collection; fluid sent for culture. Empiric antibiotics begun.
- 9/16: Fluid culture positive for *E.coli*.
- 9/18: Improved, discharged from hospital with PICC for IV antibiotics.

Case 4

- Is this an HAI?
- If so what type?

Yes

Organ/Space SSI

An organ/space SSI involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure. Specific sites are assigned to organ/space SSI to further identify the location of the infection. The table below lists the specific sites that must be used to differentiate organ/space SSI. An example is appendectomy with subsequent subdiaphragmatic abscess, which would be reported as an organ/space SSI at the intraabdominal specific site (SSI-IAB). Specific sites of organ/space (Table 2) have specific criteria which must be met in order to qualify as an NHSN event. These criteria are in addition to the general criteria for and can be found [in](#) Chapter 17.⁸

An organ/space SSI must meet one of the following criteria:

Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure

and

infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure

and

patient has at least one of the following:

- purulent drainage from a drain that is placed through a stab wound into the organ/space
- organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space
- an abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination
- diagnosis of an organ/space SSI by a surgeon or attending physician.



Remember, Organ/Space SSIs must additionally meet the criteria for the specific infection type.

Case 4 (Cont.)



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

Intraabdominal infections must meet at least 1 of the following criteria:

1. Patient has organisms cultured from purulent material from intraabdominal space obtained during a surgical operation or needle aspiration.
2. Patient has abscess or other evidence of intraabdominal infection seen during a surgical operation or histopathologic examination.
3. Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}\text{C}$), nausea, vomiting, abdominal pain, or jaundice
and
at least 1 of the following:
 - a. organisms cultured from drainage from surgically placed drain (eg, closed suction drainage system, open drain, T-tube drain)
 - b. organisms seen on Gram's stain of drainage or tissue obtained during surgical operation or needle aspiration

What specific type of SSI is it?

Specific Type: IAB Criteria 2:

Patient has abscess or other evidence of intraabdominal infection seen during a surgical operation or histopathologic examination.



Case 4

- Let's change the scenario and say that at the time of the I & D, it was discovered that the patient had suffered an anastamotic leak from which the abscess developed.
- Does this change your determination of an SSI- IAB?



Case 4

No. Although an anastomotic leak can be a complication of surgery, the fact remains that this patient meets the criterion for an SSI. If the surgery had not been performed there would not have been an anastomotic leak nor an SSI.



Case 4a

- 1 day old baby girl with atrial septal defect undergoes surgical repair. No intraoperative complications.
- Post op day 1 baby is doing well, on ventilator in the NICU, has an umbilical arterial line in place. NG tube in place for feeds. Chest tube draining small amount bloody drainage
- Post op day 2, baby progressing. Ventilator settings decreased. Lungs clear bilaterally. UA line patent and infusing.



Case 4a

- Post op day 3, baby has developed a slight cough, and is running a low grade temp. NG feedings progressing. Ventilator settings remain unchanged. Chest incision is clean, dry and intact. Chest tube drainage increased and slightly yellow.
- Post op day 4 temp 38.2 degrees C. Incision remains CDI. Cough increased. Baby irritable. Not tolerating NG feeds. Blood cultures collected X 1 through line. Empirical antibiotic coverage begun.



Case 4a

- Post op day 5, blood culture growing *Staphylococcus aureus*.
C.T. of chest shows empyema.

Does this baby have an HAI(s)? If so, what type(s)



Case 4a

Does this baby have an HAI(s)? If so, what type(s)?

*Yes. SSI- Organ Space- Lung.
BSI is secondary to LUNG.*



Case 4a

LUNG-Other infections of the lower respiratory tract

Other infections of the lower respiratory tract must meet at least 1 of the following criteria:

Patient has organisms seen on smear or cultured from lung tissue or fluid, including pleural fluid.

 *Patient has a lung abscess or empyema seen during a surgical operation or histopathologic examination.*

Patient has an abscess cavity seen on radiographic examination of lung.

Reporting instructions

Report concurrent lower respiratory tract infection and pneumonia with the same organism(s) as PNEU.

 *Report lung abscess or empyema without pneumonia as LUNG.*



Case 5

- A 79-year-old male patient is admitted with a fractured neck of femur following a fall in a nursing home. On admission the nursing home reports that the patient has MRSA colonization. Consequently, while the patient is still in the emergency room, screening cultures are taken from the nose and groin.



Case 5

- Day 1: HPRO completed. Antibiotic prophylaxis is administered peri-operatively.
- Day 2: The patient is very confused. Temperature normal. Wound condition good.
- Day 3: The results of the admission cultures of the nose and groin are positive for MRSA. The following entry is found in the patient's notes: "Patient removed the dressing several times. Recurrent confused condition. Wound edges very red and taut."



Case 5

- Day 5: Entry in the patient's notes: "Abscess at upper aspect of hip incision lanced by the attending surgeon". A wound culture sent to lab. Antibiotics begun.
- Day 6- Wound culture: MRSA
- Day 9 -Improvement in wound condition. Sent to Rehab.

Case 5



- Does this patient have an SSI?
- If so, what Type?
- If so, what is the date of the infection?

Yes. Although the patient may have strayed from standard protocol by removing the dressing, this does not negate the development of an SSI. It may represent an opportunity for improving nursing care.

*Superficial
Incisional
Primary*

*Day 3; date of first signs
of infection*



Case 6

- 7/7: Mrs. Jones has a saphenous endoscopic harvest and an internal mammary vein used for her CAB. The ICD-9-CM codes as entered are 36.12 (CBGB) and 36.15 (CBGC).

If the saphenous vein was harvested endoscopically, what NHSN operative procedure code(s) should be entered into NHSN?



Case 6

When a CBGB and a CBGC are done together on a patient on the same trip to the OR, report it as a CBGB only. That way, if the donor site incisions should get infected, you can report it as SIS or DIS. (Use of the endoscope is irrelevant for these purposes).



Case 6

If Mrs. Jones develops both a leg donor site infection and a chest incision infection, do you count both as infections or only one?

If only one, which one?

Count both

Chest as a primary site SIP, DIP or Organ/Space

Leg as a secondary site SIS, or DIS

Case 7



- Mr. H. an insulin dependent diabetic is 3 days post lumbar spinal fusion L2-L4. He has a productive cough and low grade temp. His blood sugar has been in the high 200"s.

Case 7



- Day 5: Cough continues despite pulmonary toilet; sputum now yellowish green and increased in amount. Temperature 38.4°C. CXR shows infiltrate in Right lower lobe. Surgical incision is reddened, warm and tight. Insulin dosage has been increased in response to the elevated blood glucose levels. He has been started on antibiotics for pneumonia.

Case 7



- Day 6: While ambulating and coughing, Mr. H's lumbar wound dehisces. Pus is noted within the deep incision. He is taken back to the OR emergently for exploration and closure. OR note states that moderate amount of purulent material encountered in epidural space sent for culture and the wound copiously irrigated and closed around a drain.

Case 7



Which of the following is true?

- a. Mr. H has an organ/space SSI of the type spinal abscess (SA).
- b. Mr. H. does not have an SSI because his spinal infection is due to a pneumonia.
- c. Mr. H has a deep incisional SSI.



Case 7



c. Mr. H has a deep incisional SSI

*Mr. H meets both criterion c for deep incisional SSI:
an abscess was seen on direct examination*

And

*Criterion c (among others) of organ/space SSI:
an abscess was found on direct examination during
reoperation (this also fulfills Criterion B of Spinal Abscess
without MEN)*

BUT.....



Case 7

But those pesky Reporting Instructions say:

- Occasionally an organ/space infection drains through the incision. Such infection generally does not involve reoperation and is considered a complication of the incision. Therefore, classify it as a deep incisional SSI.

SSI criteria are dissimilar to LCBI criteria in that infection at another site does not disqualify an SSI.



Case 7

What if both sputum cultures and wound cultures are obtained and both are positive for Staphylococcus aureus? Does the patient still have an SSI?

Yes. SSI criteria are dissimilar to LCBI criteria in that infection at another site does not disqualify an SSI.

Case 8



- Which of the following does not meet the criteria for superficial incisional SSI if identified within 30 days after the procedure?
 - A. Physician documents “superficial wound infection”
 - B. Purulent drainage noted from upper aspect of incision
 - C. Physician documents “cellulitis”
 - D. MRSA grows from an aseptically obtained swab of the superficial incision



Case 8



C. Physician documents “cellulitis”

Avoid using terms such as “cellulitis”, “hematoma”, “seroma” to determine whether criteria of an SSI are met. Use only those terms that are part of the criteria... redness, heat, etc.

Case 9

- 75 year old patient admitted for small bowel obstruction.
- 5/15: patient taken to OR and SB resection and appendectomy performed.
- What surgeries are recorded in NHSN?

It depends: If you are performing surveillance for both SB and APPY then both procedures are recorded . If you are only performing surveillance for one of the procedures, then you only enter that procedure.

Case 9

- If you are performing both APPY and SB surveillance, how are the durations for the individual surgeries determined?

If more than one NHSN operative procedure is performed through the same incision, record the combined duration of all procedures, which is the time from skin incision to primary closure.

Case 9

- 5/19: Patient spikes temp to 38°C, has abdominal pain and emesis. Ultrasound shows fluid collection in abdominal cavity. Needle aspiration of fluid collection. Fluid sent for culture.
- 5/20: Culture positive for *E. faecium*, many neutrophils seen.



Case 9

- Is this an HAI?
- If so, what type?

Yes

Intraabdominal abscess (IAB)

Criteria 1

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

Intraabdominal infections must meet at least 1 of the following criteria:

- ✓ 1. Patient has organisms cultured from purulent material from intraabdominal space obtained during a surgical operation or needle aspiration.
2. Patient has abscess or other evidence of intraabdominal infection seen during a surgical operation or histopathologic examination.
3. Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), nausea, vomiting, abdominal pain, or jaundice
and
at least 1 of the following
 - a. organisms cultured from drainage from surgically placed drain (eg, closed suction drainage system, open drain, T-tube drain)
 - b. organisms seen on Gram stain of drainage



Case 9

- To what surgery is the SSI attributed?
- SB
- If more than one NHSN operative procedure was done through a single incision, attempt to determine 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 a superficial incisional SSI), or if the infection site being reported is not an SSI, use the NHSN Principal Operative Procedure Selection Lists (Table 3) to select which operative procedure to report.

Case 9



Table 3. NHSN Principal Operative Procedure Selection Lists

The following lists are derived from Table 1, NHSN Operative Procedure Categories. The operative procedures with the highest risk of surgical site infection are listed before those with a lower risk.

| Priority | Code | Abdominal Operations |
|----------|------|--|
| 1 | SB | Small bowel surgery |
| 2 | KTP | Kidney transplant |
| 3 | LTP | Liver transplant |
| 4 | BILI | Bile duct, liver or pancreatic surgery |
| 5 | REC | Rectal surgery |
| 6 | COLO | Colon surgery |
| 7 | GAST | Gastric surgery |
| 8 | CSEC | Cesarean section |
| 9 | SPLE | Spleen surgery |
| 10 | APPY | Appendix surgery |
| 11 | HYST | Abdominal hysterectomy |
| 12 | OVRY | Ovarian surgery |
| 13 | HER | Herniorrhaphy |
| 14 | CHOL | Gall bladder surgery |
| 15 | AAA | Abdominal aortic aneurysm repair |
| 16 | NEPH | Kidney surgery |
| 17 | XLAP | Laparotomy |

Case 9



What if you are only performing surveillance for APPY, but not SB? How would you record this SSI?

Since you are not performing SB SSI surveillance, you are not required to enter the SSI into NHSN.



Case 10

- 4/12: 16 year old boy is admitted for emergent appendectomy. As the abdomen is entered the appendix ruptures. An appendectomy with copious irrigation of the abdomen is performed. An abdominal J.P. drain is placed through a stab incision.



Case 10

- Post op day 2 patient is doing well, progressed to clear liquid diet. Ambulating.
- Post op day 3 patient afebrile. J.P. drain site slightly red. Drainage has markedly decreased and so drain is removed. Soft diet begun, lungs clear.
- Post op day 4, previous drain site very red, small amount pus present. Low grade fever, 37.6° C.

Case 10



Does this patient have an HAI?

If so, what type/criterion?

Yes.

SKIN Criterion 1

SKIN-Skin

Skin infections must meet at least 1 of the following criteria:

1. Patient has purulent drainage, pustules, vesicles, or boils.
2. Patient has at least 2 of the following signs or symptoms with no other recognized cause: pain or tenderness, localized swelling, redness, or heat

and

at least 1 of the following:

- a. organisms cultured from aspirate or drainage from affected site; if organisms are normal skin flora (ie, diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp), they must be a pure culture
- b. organisms cultured from blood
- c. positive antigen test performed on infected tissue or blood (eg, herpes simplex, varicella zoster, *H influenzae*, *N meningitidis*)
- d. multinucleated giant cells seen on microscopic examination of affected tissue
- e. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen.



Case 10

- What if instead on Post Op day 4, , the patient's J.P. site has no redness or swelling but he has a low-grade fever (37.6° C), emesis, abdominal pain and the drain fluid appears more thick and yellowish. It is sent for culture.

Does the patient now have an HAI?
If so what type/criterion?

Case 10



No. The patient does not yet meet criteria for an HAI.

What is missing?

If the patient's drain culture is positive, then the patient meets IAB Criterion 2a

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

Intraabdominal infections must meet at least 1 of the following criteria:

1. Patient has organisms cultured from purulent material from intraabdominal space obtained during a surgical operation or needle aspiration.
2. Patient has abscess or other evidence of intraabdominal infection seen during a surgical operation or histopathologic examination.
3. Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), nausea, vomiting, abdominal pain, or jaundice

and

at least 1 of the following:

- a. organisms cultured from drainage from surgically placed drain (eg, closed suction drainage system, open drain, T-tube drain)
- b. organisms seen on Gram's stain of drainage or tissue obtained during surgical operation or needle aspiration



Case 11



- 6/8: 2 month old patient with hydrocephalus has a ventricular-peritoneal shunt placed. Patient is discharged home without complications.
- 8/22: Patient is readmitted with redness overlying the incision and it is opened subcutaneously by the surgeon and drained of milky fluid.

Case 11

- Is this an SSI?
- If so what type?
- If not, why not?

No, because this infection lies within the subcutaneous layer of tissue, it must appear within 30 days to meet criteria of a superficial SSI.

A **superficial incisional SSI** must meet one of the following criteria:

Infection occurs **within 30 days** after the operative procedure and involves only skin and subcutaneous tissue of the incision and patient has at least one of the following:

- purulent drainage from the superficial incision.
- organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
- at least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat, and superficial incision is deliberately opened by surgeon, and is culture-positive or not cultured. A culture-negative finding does not meet this criterion.
- diagnosis of superficial incisional SSI by the surgeon or attending physician.

Case 12

- 68 year old female has bilateral KPROs performed. How many procedures are recorded in NHSN?

Both procedures are recorded if following KPROs.

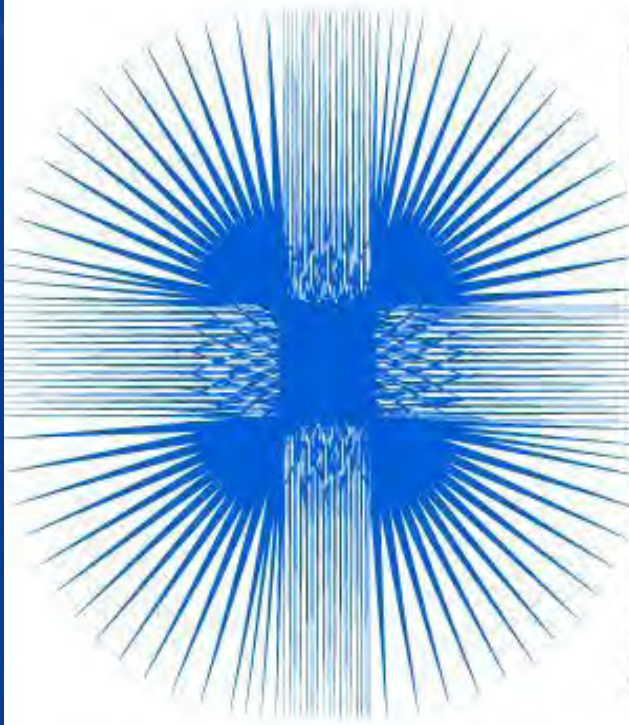
- How are the durations for the individual surgeries determined?

For bilateral operative procedures (e.g., KPRO), two separate Denominator for Procedure (CDC 57.121) are completed. To document the duration of the procedure, indicate the incision time to closure time for each procedure separately or, alternatively, take the total time for both procedures and split it evenly between the two if individual times are not known.



WELL DONE!!!





NHSN

National Healthcare
Safety Network

nhsn@cdc.gov