Surgical Site Infection (SSI) Event

Introduction: In 2014, a total of 14.2 millon operative procedures were performed in the inpatient setting in United States hospitals[1]. The CDC healthcare-associated infection (HAI) prevalence survey found that there were an estimated 157,500 surgical site infections (SSIs) associated with inpatient surgeries in 2011[2]. NHSN data included 16,147 SSIs following 849,659 operative procedures in all groups reported, for an overall SSI rate of 1.9% between 2006-2008[3]. A 17% decrease in SSI related to 10 select procedures was reported between 2008 and 2014[4].

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. SSI is associated with a mortality rate of 3%, and 75% of SSI-associated deaths are directly attributable to the SSI[5]. SSI is the most costly HAI type with an estimated annual cost of $3.3 billion, and is associated with nearly 1 million additional inpatient-days annually[6,7].

Surveillance of SSI with feedback of appropriate data to surgeons has been shown to be an important component of strategies to reduce SSI risk[8-11]. 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[9,10]. The most recent CDC and Healthcare Infection Control Practices Advisory Committee Guideline for the Prevention of Surgical Site Infection was published in 2017; this guideline provides evidence-based strategies for SSI prevention[11].

Settings: Surveillance of surgical patients will occur in any inpatient facility and/or hospital outpatient procedure department (HOPD) where the selected NHSN operative procedure(s) are performed.

Note: SSI surveillance in Ambulatory Surgery Centers (ASCs) should be performed using the Outpatient Procedure Component (OPC). The OPC replaces the use of the SSI protocol for ASCs.

Requirements:

- Perform surveillance for SSI following at least one NHSN operative procedure category (that is included in ICD-10-PCS and/or CPT NHSN operative procedure code mapping) as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).
- Collect SSI event (numerator) and operative procedure category (denominator) data on all procedures included in the selected operative procedure categories indicated on the facility's monthly reporting plan.
- A procedure must meet the NHSN definition of an operative procedure in order to be included in SSI surveillance. All procedures included in the NHSN monthly

surveillance plan are followed 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 is met during the surveillance period.
- An SSI event is attributed to the facility in which the NHSN operative procedure was performed.
- SSI events where infection present at the time of surgery (PATOS) = YES are reported to NHSN.

SSI monitoring requires active, patient-based, prospective surveillance. Concurrent and post-discharge surveillance methods should be used to detect SSIs following inpatient operative procedures and post-discharge surveillance for outpatient operative procedures.

Note: Ambulatory Surgery Centers (ASCs) please refer to the OPC protocol for guidance.

For example, these methods include:
- Review of medical records or surgery clinic patient records
    - Admission, readmission, ED, and OR logs
    - Patient charts for signs and symptoms of SSI
    - Lab, imaging, other diagnostic test reports
    - Clinician notes
    - ICD-10-CM Infection Diagnosis Codes to prompt further review
- Visit the ICU and wards – talk to primary care staff
- Surgeon surveys by mail or telephone
- Patient surveys by mail or telephone (though patients may have a difficult time assessing their infections).

Any combination of these methods is acceptable for use; however, NHSN criteria for SSI must be used. To minimize Infection Preventionists' (IPs) workload of collecting denominator data, operating room data may be downloaded.
(See file specifications at: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/ImportingProcedureData.pdf).

Operative Procedure Codes:

Operative procedure codes are used in health care settings as a way to communicate uniform information. This wide use of operative procedure codes allows NHSN to incorporate the operative procedure codes as a means to standardize NHSN SSI surveillance reporting. The operative procedure codes are required to determine the correct NHSN operative procedure category to be reported.

NHSN uses the following operative procedure coding systems:

- *International Classification of Diseases, 10th Revision Clinical Modifications/Procedure Coding System* (ICD-10-CM/PCS), as defined by the ICD-10 Coordination and Maintenance Committee of the National Center for Health Statistics and the Centers for Medicare and Medicaid Services (CMS).
- *Current Procedural Terminology* (CPT), as defined by the American Medical Association (AMA).

The mapping for ICD-10-PCS and CPT NHSN operative procedures is found in the "Supporting Materials" section of the SSI Protocol on the NHSN website. The mapping documents include a general definition for each NHSN operative procedure category as well as a description for each individual operative procedure code. Entering the operative procedure code into the NHSN application remains optional.

Note: The former NHSN Category "OTH - other" is not mapped to ICD-10-PCS and CPT NHSN operative procedure codes. An infection associated with a procedure that is not included in one of the NHSN operative procedure categories is not considered an NHSN SSI, although the infection may be investigated as a healthcare-associated infection.

Definition of an 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 reoperation via an incision that was left open during 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[12]. This may include an operating room, C-section room, interventional radiology room, or a cardiac catheterization lab.

Exclusions: Otherwise eligible procedures that are assigned an ASA score of 6 are not eligible for NHSN SSI surveillance.

Note: Incisional closure method is NOT a part of the NHSN operative procedure definition; all otherwise eligible procedures are included, regardless of closure type. Therefore both primarily closed procedures and those that are not closed primarily should be entered into the

denominator data for procedures in the facility's monthly reporting plan. Any SSIs attributable to either primarily closed or non-primarily closed procedures should be reported.

SSI Event Details:

The Infection Window Period (IWP), Present on Admission (POA), Hospital Associated Infection (HAI), and Repeat Infection Timerame (RIT) definitions do not apply to the SSI protocol. For additional POA and PATOS details, see SSI Event Reporting Instructions #2 and #3.

Date of event (DOE): For an SSI, the date of event 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.

All elements required to meet an SSI criterion usually occur within a 7-10 day timeframe with no more than 2-3 days between elements. The elements must be relational to each other, meaning you should ensure the elements all associate to the SSI, and this can only happen if elements occur in a relatively tight timeframe. Each case differs based on the individual elements occurring and the type of SSI.

Secondary BSI Attribution Period for SSI: The secondary BSI attribution period for SSI is a 17-day period that includes the date of event, 3 days prior, and 13 days after. For detailed instructions on determining whether identification of organisms from a blood specimen represents a secondary BSI, refer to the Secondary BSI Guide (Appendix B of the BSI Event Protocol).

Denominator for Procedure Details:

Additional guidance can be found within the Instructions for Completion of Denominator for Procedure Form (CDC 57.121).

ASA physical status: Assessment by the anesthesiologist of the patient's preoperative physical condition using the American Society of Anesthesiologists' (ASA) Classification of Physical Status[13]. Patient is assigned an ASA score of 1-6 at time of surgery.

Note: Do NOT report procedures with an ASA physical status of 6 (a declared brain-dead patient whose organs are being removed for donor purposes) to NHSN.

Diabetes: The NHSN SSI surveillance definition of diabetes indicates that the patient has a diagnosis of diabetes requiring management with insulin or a non-insulin anti-diabetic agent. This includes:

- Patients with "insulin resistance" who are on management with anti-diabetic agents.
- Patients with gestational diabetes.
- Patients who are noncompliant with their diabetes medications.

The ICD-10-CM diagnosis codes that reflect the diagnosis of diabetes are also acceptable for use to answer YES to the diabetes field question on the denominator for procedure entry if they are documented during the admission where the procedure is performed. These codes are found on the NHSN website in the SSI section under "Supporting Materials".

The NHSN definition of diabetes excludes patients with no diagnosis of diabetes. The definition also excludes patients who receive insulin for perioperative control of hyperglycemia but have no diagnosis of diabetes.

Duration of operative procedure: The interval in hours and minutes between the Procedure/Surgery Start Time and the Procedure/Surgery Finish Time, as defined by the Association of Anesthesia Clinical Directors (AACD)[14]:

- Procedure/Surgery Start Time (PST): Time when the procedure is begun (for example, incision for a surgical procedure).
- Procedure/Surgery Finish (PF): Time when all instrument and sponge counts are completed and verified as correct, all postoperative radiologic studies to be done in the OR are completed, all dressings and drains are secured, and the physicians/surgeons have completed all procedure-related activities on the patient.

Emergency operative procedure: A procedure that is documented per the facility's protocol to be an Emergency or Urgent procedure.

General anesthesia: The administration of drugs or gases that enter the general circulation and affect the central nervous system to render the patient pain free, amnesic, unconscious, and often paralyzed with relaxed muscles. This does not include conscious sedation.

Height: The patient's most recent height documented in the medical record in feet (ft.) and inches (in.), or meters (m).

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.

Non-primary Closure: The closure of the surgical wound in a way which leaves the skin level completely open following the surgery. Closure of any portion of the skin represents primary closure (see Primary Closure definition below). For surgeries with non-primary closure, the

deep tissue layers may be closed by some means (with the skin level left open), or the deep and superficial layers may both be left completely open. Wounds with non-primary closure may or may not be described as "packed" with gauze or other material, and may or may not be covered with plastic, "wound vacs," or other synthetic devices or materials.

Examples:

- Laparotomy in which the incision was closed to the level of the deep tissue layers, sometimes called "fascial layers" or "deep fascia," but the skin level was left open.
- The abdomen is left completely open after the surgery (an "open abdomen").

Primary Closure: The closure of the skin level during the original surgery, regardless of the presence of wires, wicks, drains, or other devices or objects extruding through the incision. This category includes surgeries where the skin is closed by some means. Thus, if any portion of the incision is closed at the skin level, by any manner, a designation of primary closure should be assigned to the surgery.

Note: If a procedure has multiple incision/laparoscopic trocar sites and any of the incisions are closed primarily then the procedure technique is recorded as primary closed.

Scope: An instrument used to visualize the interior of a body cavity or organ. In the context of an NHSN operative procedure, use of a scope involves creation of several small incisions to perform or assist in the performance of an operation rather than use of a traditional larger incision (specifically, open approach).

ICD-10-PCS codes can be helpful in answering this scope question. The fifth character indicates the approach to reach the procedure site:

ICD-10 5th Character	Approach	Scope Field
0	Open approach	No
4	Percutaneous endoscopic approach	Yes
F	Via natural or artificial opening with endoscopic assistance approach	Yes

Note: If a procedure is coded as ***open and scope*** then the procedure should be entered into NHSN as **Scope = NO**. The ***open*** designation is considered a higher risk procedure.

Trauma: Blunt or penetrating injury occurring prior to the start of the procedure. Complex trauma cases may require multiple trips to the OR during the same admission to repair the initial trauma. In such cases, trauma = Yes.

Weight: The patient's most recent weight documented in the medical record in pounds (lbs.) or kilograms (kg) prior to or otherwise closest to the procedure.

Wound class: An assessment of the degree of contamination of a surgical wound at the time of the operation. Wound class should be assigned by a person involved in the surgical procedure (for example, surgeon, circulating nurse, etc.). The wound class system used in NHSN is adapted from the American College of Surgeons wound classification schema. The four wound classifications available include Clean, Clean-Contaminated, Contaminated, and Dirty/Infected.

Based on feedback from external experts in the field of surgery, there are a group of NHSN procedures that can never be recorded as clean. These operative procedure categories are APPY, BILI, CHOL, COLO, REC, SB, and VHYS. Therefore, for these procedures in the application clean is not an option on the drop down menu.

All other operative procedure categories can be entered as clean procedures within the NHSN application. For example CSEC, HYST, or OVRY can be a clean wound class if documented as such.

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

	Superficial Incisional SSI
Comments	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 (for example, 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 (for example, donor site incision for CBGB)
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 criterion "d" for superficial incisional SSI. Conversely, an incision that is draining or that has organisms identified by culture or non-culture based testing is not considered a cellulitis. • A stitch abscess alone (minimal inflammation and discharge confined to the points of suture penetration). • Circumcision is not an NHSN operative procedure. An infected circumcision site in newborns is classified as CIRC and is not an SSI. • An infected burn wound is classified as BURN and is not an SSI. • For an NHSN operative procedure, a laparoscopic trocar site is considered a surgical incision and not a stab wound. • A localized stab wound or pin site infection is not considered an SSI; depending on the depth, these infections might be considered either a skin (SKIN) or soft tissue (ST) infection.

	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, attending physician* or other 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 attending physician for the purposes of application of the NHSN SSI criteria may be interpreted to mean the surgeon(s), infectious disease, other physician on the case, emergency physician, or physician's designee (nurse practitioner or physician's assistant).
Comments	There are two specific types of deep incisional SSIs: 1. 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 (for example, C-section incision or chest incision for CBGB) 2. 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 (for example, donor site incision for CBGB)

	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.

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.

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 the Surveillance Definitions for Specific Types of Infections chapter.)

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

SSI Numerator (SSI Event) Reporting

Numerator Data:
All patients having any of the procedures included in the selected NHSN operative procedure category(s) are monitored for SSI. The *Surgical Site Infection (SSI)* form is completed for each SSI. If no SSI events are identified during the surveillance month, check the "Report No Events" field in the Missing PA Events tab of the Incomplete/Missing List.

The Instructions for Completion of the Surgical Site Infection (CDC 57.120) form include brief instructions for collection and entry of each data element on the form. The SSI form includes patient demographic information and specific event details that pertain to the SSI event.

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.

2. **Attributing SSI to an NHSN procedure when there is evidence of infection at the time of the primary surgery:** The Present on Admission (POA) definition does not apply to the SSI protocol. If evidence of infection is present at the time of the procedure and the patient meets the NHSN SSI criteria during the SSI surveillance period, an SSI is attributed to the procedure (see PATOS below). A high wound class is not an exclusion for a patient later meeting criteria for an SSI, but in most cases is included as a risk factor for SSI in risk modeling.

3. **Infection present at time of surgery (PATOS):** PATOS denotes that there is evidence of an infection or abscess at the start of or during the index surgical procedure (in other words, it is present preoperatively). PATOS is a YES/NO field on the SSI Event form. The evidence of infection or abscess must be noted/documented intraoperatively in an operative note or report of surgery. Only select PATOS = YES if it applies to the depth of SSI that is being attributed to the procedures (for example, if a patient has evidence of an intraabdominal infection at the time of surgery and then later returns with an organ/space SSI the PATOS field would be selected as a YES. If the patient returned with a superficial or deep incisional SSI the PATOS field would be selected as a NO). The patient does not have to meet the NHSN definition of an SSI at the time of the primary procedure, but there must be notation that there is evidence of an infection or abscess present at the time of surgery. PATOS is not necessarily diagnosis driven.

    - The use of the ending “itis” in an operative note/report does not necessarily meet PATOS, as it may only reflect inflammation which is not infectious in nature (for example, diverticulitis, peritonitis, and appendicitis).
    - Identification of an organism **alone** using culture or non-culture based microbiologic testing method or on a pathology report from a surgical specimen does not = PATOS (specifically, a positive culture/path report without surgical documentation of infection is not PATOS = YES).
    - The following verbiage **alone** without specific mention of infection does not meet the PATOS definition: colon perforation, necrosis, gangrene, fecal spillage, nicked bowel during procedure, or a note of inflammation.
    - Fresh trauma resulting in a contaminated case does not necessarily meet the PATOS requirement. For example, a fresh gunshot wound to the abdomen will

be a trauma case with a high wound class but there would not have been time for infection to develop.

- PATOS can be met when an abscess is noted, there is mention of infection in the OR note, purulence or pus is noted, or "feculent peritonitis" is noted, etc. An appendix that has ruptured will meet PATOS = YES, if the patient has a subsequent intraabdominal organ space SSI.

Examples:

1. Patient admitted with an acute abdomen. Sent to OR for an XLAP where there is a finding of an abscess due to ruptured appendix and an APPY is performed. Patient returns two weeks later and meets criteria for an organ/space IAB SSI. The PATOS field would be selected as YES on the SSI event since an abscess was noted at the time of surgery in the same level as the subsequent SSI.

2. Patient is admitted with a ruptured diverticulum. In the OR note the surgeon documents that there are multiple abscesses in the intraabdominal cavity. Patient returns three weeks later and meets criteria for a superficial SSI. The PATOS field would be selected as NO since there was no documentation of evidence of infection or abscess of the superficial area at the time of the procedure.

3. During an unplanned cesarean section (CSEC) the surgeon nicks the bowel and there is contamination of the intraabdominal cavity. One week later the patient returns and meets criteria for an organ/space OREP (other reproductive) SSI. The PATOS field would be selected as NO since there was no documentation of evidence of infection or abscess at the time of the CSEC. The colon nick was a complication but there was no infection present at the time of surgery.

4. Patient undergoes a foot amputation (AMP) due to "dry-gangrene" of the foot from chronic ischemia. There is no evidence of infection at the time of surgery. The word gangrene is not sufficient to qualify for infection. The patient returns two weeks later and has a superficial SSI. The PATOS field would be selected as NO since there was no documentation of evidence of infection or abscess at the time of the AMP.

Note: For more information about PATOS, see Quick Learn titled "Surgical Site Infections (SSI) Event Form for PATOS"

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 is met during the surveillance period.

    - Report infection that involves the organ/space as an organ/space SSI, whether or not it also involves the superficial or deep incision sites.

- Report infection that involves the superficial and deep incisional sites as a deep incisional SSI.
- 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 date of event would be the date of the organ/space SSI.

5. **Attributing SSI to a NHSN procedure when several are performed on different dates:** If a patient has several NHSN operative procedures performed on different dates prior to an infection, attribute the SSI to the operative procedure that was performed most closely in time prior to the infection date, unless there is evidence that the infection was associated with a different operation.

Note: For multiple NHSN operative procedures performed within a 24 hour period, see Denominator Reporting Instruction #9.

6. **Attributing SSI to NHSN procedures that involve multiple primary incision sites:** If multiple primary incision sites of the same NHSN operative procedure become infected, only report as a single SSI, and assign the type of SSI (superficial incisional, deep incisional, or organ/space) that represents the deepest tissue level where SSI criteria is met at any of the involved primary incision sites during the surveillance period. Examples:
    - If one laparoscopic incision meets criteria for a superficial incisional SSI and another meets criteria for a deep incisional SSI, only report one deep incisional SSI.
    - If one or more laparoscopic incision sites meet criteria for superficial incisional SSI but the patient also has an organ/space SSI related to the laparoscopic procedure, only report one organ/space SSI.
    - If an operative procedure is limited to a single breast and involves multiple incisions in that breast that become infected, only report a single SSI.
    - In a colostomy formation or reversal (take down) procedure, the stoma and other abdominal incision sites are considered primary incisions. If both the stoma and another abdominal incision site develop superficial incisional SSI, report only as one SSI (SIP).

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.

8. **SSI detected at another facility:** It is required that if an SSI is detected at a facility other than the one in which the operation was performed, the IP of the index facility will be provided with enough detail so the infection can be reported to NHSN. When reporting the SSI, the index facility should indicate that Detected = RO (Readmission to facility other than where procedure was performed).

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.

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.

Tissue levels that are BELOW the deepest entered level will be 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.

11. **Reporting instructions for post-operative infection scenarios:** An SSI that otherwise meets the NHSN definitions should be reported to NHSN without regard to post-operative accidents, falls, inappropriate showering or bathing practices, or other occurrences that may or may not be attributable to patients' intentional or unintentional postoperative actions. SSI should also be reported regardless of the presence of certain skin conditions (for example, dermatitis, blister, impetigo) that occur near an incision, and regardless of the possible occurrence of a "seeding" event from an unrelated procedure (for example, dental work). This instruction concerning various postoperative circumstances is necessary to reduce subjectivity and data collection burden.

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	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
5	THOR	Thoracic surgery
Priority	**Category**	**Neurosurgical (Brain/Spine) Operative Procedures**
1	VSHN	Ventricular shunt
2	CRAN	Craniotomy
3	FUSN	Spinal fusion
4	LAM	Laminectomy
Priority	**Category**	**Neck Operative Procedures**
1	NECK	Neck surgery
2	THYR	Thyroid and or parathyroid surgery

SSI Denominator for Procedure Reporting

Denominator Data:
Denominator data are collected for each individual NHSN operative procedure category selected for monitoring on the *Patient Safety Monthly Reporting Plan*. For all patients having any of the procedures included in the NHSN operative procedure category(s) for which SSI surveillance is being performed during the month, complete the *Denominator for Procedure* form. An operative procedure code is required to determine the correct NHSN operative procedure category to be reported. The Instructions for Completion of the Denominator for Procedure form include brief instructions for collection and entry of each data element on the form.

Denominator Reporting Instructions:

1. **Closure type**: Incisional closure type does not exclude a procedure from SSI surveillance. All otherwise eligible procedures are included in the denominator reporting, regardless of closure type. The closure technique is entered for each denominator for procedure. If a procedure has multiple incision sites and any of the incisions are closed primarily then the procedure is entered as a primary closure.

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

2. **Wound class**: A high wound class is not an exclusion for denominator reporting. If the procedure meets the definition of an NHSN operative procedure it should be reported in the denominator data regardless of wound class. NHSN will use the wound class for risk adjustment, as appropriate.

3. **Different operative procedure categories performed during same trip to the OR:** If procedures in more than one NHSN operative procedure category are performed during the same trip to the operating room through the same or different incisions, a *Denominator for Procedure* form is reported for each NHSN operative procedure category being monitored. For example, if a CARD and CBGC are done through the same incision, a *Denominator for Procedure* form is reported for each. In another example, if following a motor vehicle accident, a patient has an open reduction of fracture (FX) and splenectomy (SPLE) performed during the same trip to the operating room and both procedure categories are being monitored, complete a *Denominator for Procedure* form for each.

   EXCEPTION: If a patient has both a CBGC and CBGB during the same trip to the operating room, report only as a CBGB. Only report as a CBGC if there is only a chest incision. CBGB and CBGC are never reported for the same patient for the same trip to the operating room.

4. **Duration of the procedure when more than one category of NHSN operative procedure is performed through the same incision:** If more than one NHSN operative procedure category is performed through the same incision during the same trip to the operating room, record the combined duration of all procedures, which is the time from procedure/surgery start time to procedure/surgery finish time. For example, if a CBGC and a CARD are performed on a patient during the same trip to the operating room, the time from start time to finish time is reported for both operative procedures.

5. **Duration of operative procedures if patient has two different NHSN operative procedures performed via separate incisions on the same trip to the OR:** Try to determine the correct duration for each separate procedure (if this is documented); otherwise, take the time for both procedures and split it evenly between the two.

6. **Same operative procedure category but different ICD-10-PCS or CPT codes during same trip to the OR:** If procedures of different ICD-10-PCS or CPT codes from the same NHSN operative procedure category are performed through the same incision/laparoscopic sites, record only one procedure for that category. For example, a facility is performing surveillance for CARD procedures. A patient undergoes a replacement of both the mitral and tricuspid valves during the same trip to the operating room. Complete one CARD *Denominator for Procedure* form because both procedures are in the same operative procedure category (CARD).

7. **For revision HPRO and KPRO procedures:** If total or partial revision HPRO or KPRO is performed, determine if any of the ICD-10-PCS/CM diagnosis or procedure codes indicating infection (see link below) were assigned to the index joint in the 90 days prior to and including the index HPRO or KPRO revision. If any of the specified codes are assigned to the procedure, indicate on the denominator for procedure form that the revision was associated with 'prior infection at index joint' = YES. The 'prior infection at index joint' variable only applies to *revision* HPRO and KPRO. The cases designated 'prior infection at index joint' = YES should be validated before the procedure is submitted to NHSN. This validation is necessary to ensure the code is aligned with the index joint revision. The ICD-10-PCS/CM code mapping guidance is found on the NHSN website in the SSI section under "Supporting Materials."

8. **Same NHSN operative procedure via separate incisions:** For operative procedures that can be performed via separate incisions during same trip to operating room (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.

9. **More than one operative procedure through same incision within 24 hours:** When a patient has more than one operative procedure via the same incision 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.

10. **Patient expires in the OR:** If a patient expires in the operating room, do not complete a *Denominator for Procedure* form. This operative procedure is excluded from the denominator.

11. **HYST or VHYS:** For the purpose of NHSN SSI reporting, hysterectomy procedure codes that involve an incision made into the abdomen, including trocar insertion, are listed in the abdominal hysterectomy (HYST) category. The correct CPT hysterectomy procedure codes should be assigned by a medical record coder using current guidelines and conventions. Hysterectomy procedures should be designated as an HYST or VHYS, based on the approach of the procedure (5th character of the ICD-10 operative procedure code) that the facility's medical coder assigns to the hysterectomy procedure.

Procedure	ICD-10 5th Character	Approach
HYST	0	Open
	4	Percutaneous endoscopic
	F	Via natural or artificial opening with percutaneous endoscopic assistance
VHYS	7	Via natural or artificial opening
	8	Via natural or artificial opening with endoscopic

Data Analyses: The Standardized Infection Ratio (SIR) is calculated by dividing the number of observed infections by the number of predicted (expected) infections. The number of predicted infections is calculated using SSI probabilities estimated from multivariate logistic regression models constructed from NHSN data during a baseline time period, which represents a standard population's SSI experience[3]. The procedures/SSI occurring in adults are modeled separately from those occurring in pediatrics.

There are three main SSI SIR Models available from NHSN, each briefly described in the table below. The first two models, the All SSI SIR and the Complex A/R SSI SIR models, are available for all NHSN operative procedures/SSI occurring in both adults and pediatric patients, while the third model, the Complex 30-day SSI SIR is available for colon and abdominal hysterectomy procedures/SSI occurring in adults only.

Please see the NHSN SIR Guide for more model specific information:
https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf

All SSI SIR Model	• Includes separate models for inpatient and hospital outpatient procedures (under the 2015 baseline) • Includes Superficial, Deep & Organ/Space SSIs • Superficial & Deep incisional SSIs limited to primary incisional SSIs only • Includes SSIs identified on admission, readmission & via post-discharge surveillance
Complex A/R SSI Model	• Includes only Deep incisional primary SSIs & Organ/Space SSIs • Includes only SSIs identified on Admission/Readmission to facility where procedure was performed • Includes only inpatient procedures • Used for the HAI Progress Report, published annually by CDC
Complex 30-day SSI model (used for CMS IPPS)	• Includes only in-plan, inpatient COLO and HYST procedures in adult patients (specifically, ≥ 18 years of age) • Includes only deep incisional primary SSIs and organ/space SSIs with an event date within 30 days of the procedure • Includes SSIs identified on admission, readmission & via post-discharge surveillance • **Uses Diabetes, ASA score, gender, age, BMI, oncology hospital and closure technique to determine risk for COLO (under the 2015 baseline, BS2)** **Uses Diabetes, ASA score, age, BMI and oncology hospital to determine risk for HYST (under the 2015 baseline, BS2)** • **NOTE:** The Complex 30-day SSI model, under the 2006-2008 baseline, BS1, uses only age and ASA to determine risk for both COLO and HYST (BS1 applies to data up to 2016) • Used only for CMS IPPS reporting and for public reporting on Hospital Compare

While the SSI SIR can be calculated for single procedure categories and for specific surgeons, the measure also allows you to summarize your data across multiple procedure categories while adjusting for differences in the estimated probability of infection among the patients included across the procedure categories. For example, you will be able to obtain one SSI SIR adjusting for all procedures reported. Alternatively, you can obtain one SSI SIR for all COLO only within your facility.

Additional Notes about SSI SIRS:

1. **Rebaseline of NHSN data:** The new baseline, termed BS2, and updated risk-adjustments of HAI data using the 2015 NHSN data is available in the application as of January 2017. The new baseline can be applied to 2015 data and forward. The older baseline, termed BS1, which used the 2006-2008 NHSN data, will also be available in the application and may be applied to only the 2016 data and older.
2. **Closure technique:** All of the SSI SIRs that use the 2006-2008 SSI baseline data will include only those procedures that were reported with a primary closure method. All of the SSI SIRs that use the 2015 baseline data will include all procedures that were reported with primary or other than primary closure methods.
3. **Infection present at time of surgery (PATOS):** All of the SSI SIR reports that use the 2006-2008 SSI baseline will include SSIs that are reported as present at time of surgery. Meaning the PATOS event is included in the numerator of the SIR and the procedure from which the event occurred is included in the denominator of the SIR. All of the SSI SIR reports that use the new 2015 SSI baseline will exclude SSIs that are reported as present at time of surgery from both the numerator and denominator. Meaning the PATOS event is excluded in the numerator of the SIR and the procedure from which the event occurred is excluded in the denominator of the SIR.
4. **SIRs based on Procedure Date:** SSIs will be included in the numerator of an SIR based on the date of procedure, not the date of event. This is because the procedure carries the risk for the infection/SSI.
5. **Calculation of the SIR:** The SIR will be calculated only if the number of predicted HAIs ("numPred" in the NHSN application, previously known as the number of expected HAIs, "numExp") is ≥ 1 to help enforce a minimum precision criterion.

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Predicted (P) HAIs}}$$

SSI rates per 100 operative procedures are calculated by dividing the number of SSIs by the number of specific operative procedures and multiplying the results by 100. SSIs will be included in the numerator of a rate based on the date of procedure, not the date of event. Using the advanced analysis feature of the NHSN application, SSI rate calculations can be performed separately for the different types of operative procedures and stratified by the basic risk index.

Descriptive analysis options of numerator and denominator data are available in the NHSN application, such as line listings, frequency tables, and bar and pie charts. SIRs and SSI rates and run charts are also available. Guides on using NHSN analysis features are available from: www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html

APPENDIX. SSI specific event types attributed to each 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
BRST - Breast surgery	BRST - Breast abscess or mastitis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary
CARD - Cardiac surgery	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary VASC - Arterial or venous infection

Operative Procedure Category	Specific Event Type
CBGB - Coronary bypass with chest & donor incisions	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary VASC - Arterial or venous infection
CBGC - Coronary bypass graft with chest incision	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary VASC - Arterial or venous infection
CEA - Carotid endarterectomy	DIP - Deep Incisional Primary DIS - Deep Incisional Secondary SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary VASC - Arterial or venous infection
CHOL - Gallbladder surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
COLO - Colon surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
CRAN - Craniotomy	BONE - Osteomyelitis DIP - Deep Incisional Primary IC - Intracranial infection MEN - Meningitis or ventriculitis SINU - Sinusitis SIP - Superficial Incisional Primary

Operative Procedure Category	Specific Event Type
CSEC - Cesarean section	DIP - Deep Incisional Primary EMET - Endometritis GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
FUSN - Spinal fusion	BONE - Osteomyelitis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary DISC - Disc space infection IAB - Intraabdominal, not specified elsewhere IC - Intracranial infection LUNG - Other infections of the lower respiratory tract MEN - Meningitis or ventriculitis SA - Spinal abscess/infection SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary
FX - Open reduction of fracture	BONE - Osteomyelitis DIP - Deep Incisional Primary JNT - Joint or bursa SIP - Superficial Incisional Primary
GAST - Gastric surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract SIP - Superficial Incisional Primary
HER - Herniorrhaphy	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
HPRO - Hip prosthesis	BONE - Osteomyelitis DIP - Deep Incisional Primary PJI - Periprosthetic joint infection SIP - Superficial Incisional Primary

Operative Procedure Category	Specific Event Type
HTP - Heart transplant	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary VASC - Arterial or venous infection
HYST - Abdominal hysterectomy	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary VCUF - Vaginal cuff infection
KPRO - Knee prosthesis	BONE - Osteomyelitis DIP - Deep Incisional Primary PJI - Periprosthetic joint infection SIP - Superficial Incisional Primary
KTP - Kidney transplant	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection VASC - Arterial or venous infection
LAM - Laminectomy	BONE - Osteomyelitis DIP - Deep Incisional Primary DISC - Disc space infection IAB - Intraabdominal, not specified elsewhere IC - Intracranial infection MEN - Meningitis or ventriculitis SA - Spinal abscess/infection SIP - Superficial Incisional Primary
LTP - Liver transplant	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary VASC - Arterial or venous infection

Operative Procedure Category	Specific Event Type
NECK - Neck surgery	DIP - Deep Incisional Primary EAR - Ear, mastoid infection ORAL - Oral cavity infection (mouth, tongue, or gums) SIP - Superficial Incisional Primary UR - Upper respiratory tract infection, pharyngitis, laryngitis, epiglottitis
NEPH - Kidney surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
OVRY - Ovarian surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
PACE - Pacemaker surgery	CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary VASC - Arterial or venous infection
PRST - Prostate surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
PVBY - Peripheral vascular bypass surgery	DIP - Deep Incisional Primary DIS - Deep Incisional Secondary SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary VASC - Arterial or venous infection
REC - Rectal surgery	DIP - Deep Incisional Primary DIS - Deep Incisional Secondary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary USI - Urinary System Infection

Operative Procedure Category	Specific Event Type
SB - Small bowel surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
SPLE - Spleen surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
THOR - Thoracic surgery	BONE - Osteomyelitis BRST - Breast abscess or mastitis DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract SIP - Superficial Incisional Primary
THYR - Thyroid and/or parathyroid surgery	DIP - Deep Incisional Primary EAR - Ear, mastoid infection GIT - Gastrointestinal tract SIP - Superficial Incisional Primary UR - Upper respiratory tract infection, pharyngitis, laryngitis, epiglottitis
VHYS - Vaginal hysterectomy	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection VCUF - Vaginal cuff infection
VSHN - Ventricular shunt	BONE - Osteomyelitis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary IAB - Intraabdominal, not specified elsewhere IC - Intracranial infection LUNG – Other infections of the lower respiratory tract MEN - Meningitis or ventriculitis SA - Spinal abscess/infection SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary

Operative Procedure Category	Specific Event Type
XLAP - Exploratory laparotomy	DIP - Deep Incisional Primary EMET - Endometritis GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection

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