Surgical Site Infection (SSI) Surveillance

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Updated November 20, 2012

Nothing to Disclose

Updated SSI Slide Numbers

- 86 – Added code OTH to the 30-day list and code VSHN to the 90-day list
- 89 – POA infection definition removed; not used in 2013
- 90 – Example 1 modified (Example 2 removed)
- 94 – Wording “in Table 5” added
- 101 – Updated wording of Date of Event
- 110 – Modified definition of post-discharge detected
- 112 – Removed word “exactly”
- 113 – Example modified
- 114 – Replaced secondary BSI flow diagram with additional guidance

* There will be an “Updated Slide” note on each slide
NHSN Structure
4 Components

NHSN

- Patient Safety
- Healthcare Personnel Safety
- Biovigilance
- Long Term Care

Patient Safety Component
5 Modules

- Patient Safety Component

Device-associated Module
Procedure-associated Module
Medication-associated Module
MDRO & CDI Module
Vaccination Module
**Procedure-associated Module**

**SSI** Surgical site infection

Post-procedure pneumonia (PPP) is being retired at end of 2012

**Resources for SSI Surveillance**

- NHSN Forms (January 2013)
  - 57.106: Monthly Reporting Plan
  - 57.120: Surgical Site Infection
  - 57.121: Denominator for Procedure
Resources for SSI Surveillance

  - Ch 1: NHSN Overview: Surveillance Techniques
  - Ch 3: Monthly Reporting Plan
  - Ch 9: SSI Protocol, Forms, and Tables of Instructions
  - Ch 16: Key Terms
  - Ch 17: Infection Site Definitions

http://www.cdc.gov/nhsn/TOC_PSCManual.html

Monthly Reporting Plan

- Plans are the roadmap to your data
- Only data included in Plans will be used by CDC in aggregate data analysis (i.e., only “in-Plan” data)
- Plans drive much of the business logic of the NHSN application
- Must have one for every month of the year
Changes to Plan in 2013 for PA Module

- No Post-procedure Pneumonia (PPP)
- For SSI, no choice for “Both” but will be able to indicate that both in- and out-patients are being monitored for SSI

SSI - Active Surveillance Methods

- Determine which surgical patients you will monitor
- Review admission, readmission, and OR logs
- Review patient charts for signs and symptoms of SSI, risk factors
- Review lab, Xray, other diagnostic test reports
- Review nurses and physician notes
- Visit the ICU and wards – talk to primary care staff
Post-discharge SSI Surveillance Methods

- Surgeon and/or patient surveys by mail or phone
  - Develop a tool that includes the SSI and most common specific infection site criteria for the operative procedures being monitored
  - Train surgeons and their office staff
- Review of postoperative clinic records

Criteria must be met regardless of where the SSI is detected!

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CMS Reporting via NHSN – Current Requirements (as of 5/9/2012)

<table>
<thead>
<tr>
<th>HAI Event</th>
<th>Facility Type</th>
<th>Reporting Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI</td>
<td>Acute Care Hospitals: Adult, Pediatric, and Neonatal ICUs</td>
<td>January 2011</td>
</tr>
<tr>
<td>CAUTI</td>
<td>Acute Care Hospitals: Adult and Pediatric ICUs</td>
<td>January 2012</td>
</tr>
<tr>
<td>SSI</td>
<td>Acute Care Hospitals: Inpatient COLO and HYST Procedures</td>
<td>January 2012</td>
</tr>
<tr>
<td>I.V. antimicrobial start</td>
<td>Outpatient Dialysis Facilities</td>
<td>January 2012</td>
</tr>
<tr>
<td>Positive blood culture</td>
<td>Outpatient Dialysis Facilities</td>
<td>January 2012</td>
</tr>
<tr>
<td>Signs of vascular access infection</td>
<td>Outpatient Dialysis Facilities</td>
<td>January 2012</td>
</tr>
<tr>
<td>CLABSI</td>
<td>Long Term Care Hospitals*: Adult and Pediatric LTAC ICUs and Wards</td>
<td>October 2012</td>
</tr>
<tr>
<td>CAUTI</td>
<td>Long Term Care Hospitals*: Adult and Pediatric LTAC ICUs and Wards</td>
<td>October 2012</td>
</tr>
<tr>
<td>CAUTI</td>
<td>Inpatient Rehabilitation Facilities: Adult and Pediatric IRF Wards</td>
<td>October 2012</td>
</tr>
<tr>
<td>MRSA Bacteremia LabID Event</td>
<td>Acute Care Hospitals: FacWideIN</td>
<td>January 2013</td>
</tr>
<tr>
<td>C. difficile LabID Event</td>
<td>Acute Care Hospitals: FacWideIN</td>
<td>January 2013</td>
</tr>
<tr>
<td>HCW Influenza Vaccination</td>
<td>Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>HCW Influenza Vaccination</td>
<td>Ambulatory Surgical Centers</td>
<td>October 2014</td>
</tr>
</tbody>
</table>

* Long Term Care Hospitals are called Long Term Acute Care Hospitals in NHSN
NHSN and CMS

- COLO and HYST must be included in your Monthly Reporting Plans every month for data to be reported on your behalf to CMS
- Must follow the NHSN SSI protocol exactly and report complete and accurate data in a timely manner
  - Report each SSI detected or indicate that no SSI occurred
  - Report each COLO and HYST performed on inpatients


NHSN and CMS

- A subset of SSI following in-Plan, inpatient COLO and HYST procedures are used to fulfill CMS reporting requirements:
  - ≥18 year old patient at time of surgery
  - Deep incisional primary or organ/space SSI
  - Detected by all surveillance methods (A, P, RF, RO) within 30 days of date of procedure
- The risk models used to calculate the expected number of SSI for the SIR are based only on the patient’s age and ASA score

COLO and HYST

<table>
<thead>
<tr>
<th>Legacy Code</th>
<th>Operative Procedure</th>
<th>Description</th>
<th>ICD-9-CM Codes / CPT Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLO</td>
<td>Colon surgery</td>
<td>Incision, resection, or anastomosis of the large intestine; includes large-to-small and small-to-large bowel anastomosis; does not include rectal operations</td>
<td>17.31-17.36, 17.39, 45.03, 45.26, 45.41, 45.49, 45.52, 45.71-45.76, 45.79, 45.81-45.83, 45.92-45.95, 46.03, 46.04, 46.10, 46.11, 46.13, 46.14, 46.43, 46.52, 46.75, 46.76, 46.94, 44140, 44141, 44143, 44144, 44145, 44146, 44147, 44150, 44151, 44160, 44204, 44205, 44206, 44207, 44208, 44210</td>
</tr>
<tr>
<td>HYST</td>
<td>Abdominal hysterectomy</td>
<td>Abdominal hysterectomy; includes that by laparoscope</td>
<td>68.31, 68.39, 68.41, 68.49, 68.61, 68.69, 58150, 58152, 58180, 58200, 58210, 58241, 58542, 58543, 58544, 58548, 58570, 58571, 58572, 58573, 58951, 58953, 58954, 58956</td>
</tr>
</tbody>
</table>

HYST Reporting Detail

- Which structures and how they are detached (the surgical technique or approach), not the location of where the structures were physically removed, determines how the ICD-9-CM code is assigned
  - 68.41 – Laparoscopic total abdominal hysterectomy (HYST), even if uterus is removed through the vagina
  - 68.51 – Laparoscopically assisted vaginal hysterectomy (VHYS); vaginal incision
If you have no SSI to report...

- Click on Event → Incomplete
- Click on Missing PA Events tab
- Check Report No Events next to SSI; Save

Denominator data are collected using this form.

SSI data are collected using this form.
Key Term: NHSN Operative Procedure

A procedure that
1. is performed on a patient who is an NHSN inpatient or an NHSN outpatient,
2. takes place during an operation where a surgeon makes a skin or mucous membrane incision (including the laparoscopic approach) and primarily closes the incision before the patient leaves the operating room, and
3. is represented by an NHSN Operative Procedure Code.

Skin-to-skin

Primary Closure

- Primary closure is defined as closure of all tissue levels, regardless of the presence of wires, wicks, drains, or other devices or objects extruding through the incision.
- However, regardless of whether anything is extruding from the incision, if the skin edges are not fully approximated for the entire length of the incision (e.g., are loosely closed with gaps between suture/staple points), the incision is not considered primarily closed and therefore the procedure would not be considered an operation. In such cases, any subsequent infection would not be considered an SSI, although it may be an HAI if it meets criteria for another specific infection site (e.g., skin or soft tissue infection).
Key Term: NHSN Inpatient

A patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.

Key Term: NHSN Outpatient

A patient whose date of admission to the healthcare facility and the date of discharge are the same day.
**Key Term: Operating Room**

- A patient care area that met the Facilities Guidelines Institute or American Institute of Architects’ criteria for an operating room when it was constructed or renovated.
- May include:
  - Traditional operating room
  - C-section room
  - Interventional radiology room
  - Cardiac catheterization lab

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**NHSN Operative Procedure Codes**

Each NHSN operative procedure category is defined by a group of ICD-9-CM procedure codes.

<table>
<thead>
<tr>
<th>Legacy Code</th>
<th>Operative Procedure</th>
<th>Description</th>
<th>ICD-9-CM Codes/CPT Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTP</td>
<td>Heart transplant</td>
<td>Transplantation of heart</td>
<td>37.51-37.55</td>
</tr>
<tr>
<td>HYST</td>
<td>Abdominal hysterectomy</td>
<td>Abdominal hysterectomy, includes that by laparoscope</td>
<td>68.31, 68.39, 68.41, 68.49, 68.61, 68.69, 58150, 58152, 58180, 58200, 58210, 58541, 58542, 58543, 58544, 58545, 58546, 58570, 58571, 58572, 58573, 58574, 58575, 58576, 58577, 58578, 58579, 58951, 58953, 58954</td>
</tr>
<tr>
<td>KPRO</td>
<td>Knee prosthesis</td>
<td>Arthroplasty of knee</td>
<td>60-64, 81-83</td>
</tr>
<tr>
<td>KTP</td>
<td>Kidney transplant</td>
<td>Transplantation of kidney</td>
<td>00.89, 50.08</td>
</tr>
</tbody>
</table>

CPT codes do not take precedence over ICD-9 codes when categorizing NHSN operative procedures.
### NHSN Operative Procedures

When an NHSN Operative Procedure is selected for monitoring, all the procedures within that category must be followed.

<table>
<thead>
<tr>
<th>Code</th>
<th>Procedure</th>
<th>Description</th>
<th>ICD-9-CM Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Abdominal aortic aneurysm repair</td>
<td>Resection of abdominal aorta with anastomotic replacement</td>
<td>38.34, 38.44, 38.64</td>
</tr>
<tr>
<td>AMP</td>
<td>Limb amputation</td>
<td>Total or partial amputation or disarticulation of the upper or lower limbs, including digits</td>
<td>84.00-84.19, 84.91</td>
</tr>
<tr>
<td>APPY</td>
<td>Appendix surgery</td>
<td>Operation of appendix (not incidental to another procedure)</td>
<td>47.01, 47.09, 47.2, 47.91, 47.92, 47.99</td>
</tr>
<tr>
<td>AVSD</td>
<td>Shunt for dialysis</td>
<td>Arteriovenostomy for renal dialysis</td>
<td>39.27, 39.42</td>
</tr>
</tbody>
</table>

### Completing the Denominator for Procedure Form
Denominator Data

- The surveillance period is one month.
- Complete a Denominator for Procedure record for every operation meeting the NHSN operative procedure definition that was done during that month if it is in your Monthly Reporting Plan.
- Submit data within a month of the end of this period.

Denominator for Procedure

For example, if your Monthly Reporting Plan indicates that you will monitor COLO procedures in January, and 43 COLO were done that month, then you should enter / import 43 separate COLO procedure records into NHSN by the end of February.
Denominator for Procedure

Patient Information:
Patient ID, Gender, and Date of Birth are required.

Denominator for Procedure

Patient ID, Procedure #, Social Security #, Medicare #, Date of Birth, Ethnicity (Specify), Race (Specify), NHSN Procedure Code, ICD-9-CM Procedure Code, Outpatient: Yes/No, Duration: Hours Minutes, General Anesthesia: Yes/No, Emergency: Yes/No, ASA Score: 1 2 3 4 5, Trauma: Yes/No, Surgeon Code: 

Procedure Code and Procedure Date

The NHSN Procedure Code and the Date of Procedure must be entered. The ICD-9-CM code is optional.
If you enter the ICD-9 code first, the NHSN procedure code will be automatically populated.

**Procedure Details – Outpatient and Duration**

Outpatient: **Required.**
If admission and discharge dates are the same calendar date, select Yes; otherwise, select No.

*Duration: Required.
Record the hours and minutes between the skin incision and skin closure.
Do not record anesthesia time!
Important Note

- In Chapter 9, the Reporting Instructions in the Denominator Data section and the Table of Instructions provide important guidance on the many nuances of how to report the number of operative procedure records and their details in a variety of situations.
- The examples shown in this presentation are only some of them.
- Please read and follow all of the instructions carefully!

Reporting Instructions

- Some operative procedures have more than one incision
  - CBGB, and certain operations in the CEA, FUSN, RFUSN, and PVBY categories
  - Example: CBGB in which an incision to harvest a donor vessel is made that is separate from the primary incision
  - Example: FUSN with both anterior and posterior approaches
- Complete only one Denominator for Procedure form
  - Record the duration as time from first skin incision to primary closure of last incision
Reporting Instruction

- If procedures in more than one NHSN operative procedure category are done through the same incision during the same trip to the OR, create a record for each procedure that you are monitoring in the Monthly Reporting Plan, and use the total time for the duration for each record.

Example: Patient had a coronary artery bypass graft with a chest incision only (CBGC) and also a mitral valve replacement (CARD). The time from skin incision to skin closure was 5 hours. A Denominator for Procedure form is completed for the CBGC and another for the CARD, indicating the duration as 5 hours and 0 minutes on each form.

Reporting Instruction

- EXCEPTION: If a patient has both a CBGC and a CBGB during the same trip to the OR, report only as a CBGB.

Example: Patient was scheduled to have a coronary artery bypass graft with a chest incision only (CBGC), however during the procedure it became necessary to harvest a vessel from the leg. Even though an ICD-9-CM procedure code for a CBGC and a CBGB will be assigned by coders, only complete a CBGB Denominator for Procedure form. The time from chest skin incision to chest primary closure is reported for the duration of the procedure.
Reporting Instruction

- If the patient goes to the OR more than once during the same admission and another procedure of the same or different NHSN operative procedure category is performed through the same incision within 24 hours of the end of the original incision, report only one Denominator for Procedure form for the original procedure combining the durations for both procedures.

Example: Patient had colon surgery (COLO) performed on Tuesday morning which had a duration of 3 hours and 10 minutes. On Tuesday evening, he was returned to the OR where the COLO incision was opened to repair a bleeding vessel (OTH). The duration of the second procedure was 1 hour and 10 minutes. Report only one COLO with a combined duration of 4 hours and 20 minutes. Do not report an OTH record.

Reporting Instruction: Bilateral Procedures

- For procedures that can be performed bilaterally during the same trip to the OR (e.g., KPRO), two separate Denominator for Procedure forms are completed.

To document the duration of the procedure, indicate the incision time to closure for each procedure separately or, alternatively, take the total time for both procedures and split it evenly between the two.
**Procedure Details – Wound Class**

**Denominator for Procedure**

- **Wound class** is an assessment of the likelihood and degree of contamination of a surgical wound at the time of the operation.

- **Clean (I)**
  - Uninfected wound with no inflammation
  - Respiratory, alimentary, genital* or uninfected urinary tract are not entered
  - Primarily closed
  - Closed drainage, if needed

- **Clean-Contaminated (II)**
  - Respiratory, alimentary, genital*, or urinary tracts entered under controlled conditions and without unusual contamination
  - Include operations on biliary tract, appendix, vagina, oropharynx if no evidence of infection or major break in technique

*Includes female and male reproductive tracts
## Wound Class

### Contaminated (III)
- Open, fresh, accidental wounds
- Major breaks in sterile technique or gross spillage from the GI tract
- Includes incisions into acute, nonpurulent inflamed tissues

### Dirty or Infected (IV)
- Old traumatic wounds with retained devitalized tissue
- Wounds involving existing clinical infection or perforated viscera

**Note:** NHSN allows “unknown” to be reported through 2013, however, the procedure will not be included in the aggregate pool or your facility’s risk-adjusted metrics.

## Wound Class Cases

<table>
<thead>
<tr>
<th>Case</th>
<th>Wound Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susanne had an appendectomy following 1 day of acute abdominal pain with rebound tenderness. At the end of the case, the surgeon indicates that the appendix was inflamed and the surgical area was irrigated and cefoxitin was ordered for 3 days postoperatively.</td>
<td>3</td>
</tr>
<tr>
<td>Fred had a cholecystectomy using a laparoscopic technique. The gallbladder was removed successfully with no breaks in operative asepsis.</td>
<td>2</td>
</tr>
<tr>
<td>George had a KPRO revision. When the surgeon makes the incision into the surgical site, she notes that the knee joint demonstrates purulent material and inflammation. A specimen is obtained and sent to the laboratory which grows <em>S. aureus</em> (MSSA).</td>
<td>4</td>
</tr>
<tr>
<td>Mary had a scheduled, uneventful abdominal hysterectomy.</td>
<td>2</td>
</tr>
</tbody>
</table>
Procedure Details –
General Anesthesia

General Anesthesia: Required.
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.

Procedure Details –
ASA Score

ASA Score: Required.
An assessment score by the anesthesiologist of the patient's preoperative physical condition using the American Society of Anesthesiologists' Classification of Physical Status schema.
ASA Score

- Required only for inpatient procedures

1. Normally healthy patient
2. Patient with mild systemic disease
3. Patient with severe systemic disease that is not incapacitating
4. Patient with an incapacitating systemic disease that is a constant threat to life
5. Moribund patient who is not expected to survive for 24 hours with or without operation

Procedure Details – Emergency

Denominator for Procedure

- Emergency: Required.
  Select Yes if this operative procedure was a nonelective and unscheduled operation; otherwise, select No.
**Procedure Details – Trauma**

- **Trauma:** Required. If this operation was done because of blunt or penetrating trauma, select Yes.

**Procedure Details – Scope**

- **Scope:** Required. If the entire NHSN operative procedure was performed using a laparoscope/robotic assist, select Yes.

Select No if incision was extended for hand assist or fully converted to an open approach.

Select Yes if scope used for HYST or VHYS even if uterus was removed through the vagina.

Select Yes if scope used to harvest donor vessel during a CBGB.
If more than one surgeon performed the operation, enter the code for the surgeon who was primarily responsible for the case.

<table>
<thead>
<tr>
<th>Procedure Details – Implant</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No longer required!</td>
</tr>
<tr>
<td>- Instead certain operative procedures will require monitoring for deep incisional or organ/space SSI for either 30 days or 90 days</td>
</tr>
<tr>
<td>- Implant definition too broad which limited its usefulness as an SSI stratifier</td>
</tr>
<tr>
<td>- Also too difficult to collect</td>
</tr>
</tbody>
</table>
Additional Fields
Required for Specific Procedures

There are 5 procedures for which additional risk factors are collected:
- Cesarean Section – CSEC
- Spinal Fusion and Refusion – FUSN; RFUSN
- Hip Arthroplasty – HPRO
- Knee Arthroplasty – KPRO

When any of the above procedures are included in the Monthly Reporting Plan, the corresponding additional fields must be completed.
Cesarean Section — CSEC

- Height in feet and inches or meters
- Weight in pounds or kilograms
- Number of hours of labor in the hospital
- Estimated blood loss no longer required as of 1/1/2012

Reporting Instruction: Labor

- Length of time from beginning of active labor as an inpatient to delivery of the infant, expressed in hours (if ≤30 min, round down; >30 min, round up; if none, enter 0)
- Check for documentation in chart
- May be defined by your hospital's policies and procedures but should reflect the onset of regular contractions or induction that leads to delivery during this admission
Fusion (FUSN) and Refusion (RFUSN)

Select whether the procedure was FUSN or RFUSN

Indicate here whether or not the patient is diabetic

Check the appropriate spinal level

Select the approach used in the procedure

Hip Arthroplasty – HPRO

If the procedure is HPRO, indicate here which type of HPRO was performed
Knee Arthroplasty – KPRO

If the procedure is KPRO, indicate here which type of KPRO was performed.

Summary

- Complete and enter or import a Denominator for Procedure record for every NHSN operative procedure performed that is selected for surveillance.
- Use the SSI Protocol, Tables of Instructions, and Key Terms chapters of the Patient Safety Manual for guidance.
Linking and Importing Records

Denominator for Procedure and SSI records must be LINKED so that the correct risk factor data are matched to the SSI for a given patient.
Linking Procedure and SSI Records

1. Enter the Denominator for Procedure record
2. Enter the SSI record
3. Link the two records

Step 2

When SSI is selected from the Event Type field, the link button automatically appears on the screen and message indicates that the event is not linked. Click on the button. Don't need to enter the procedure data.
A new screen appears listing all the operative procedures this patient has had.

Check the box next to the appropriate procedure, and click on the “Link/Unlink” button.

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### Link Procedure List

<table>
<thead>
<tr>
<th>Event #</th>
<th>NHSN Procedure Code</th>
<th>ICD-9-CM Code</th>
<th>Procedure Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>002843</td>
<td>HPRO</td>
<td></td>
<td>03/05/2008</td>
</tr>
</tbody>
</table>

---

**Event Information**

| Event Type**: SSI - Surgical Site Infection | Date of Event**: 03/05/2008 |
| NHSN Procedure Code**: HPRO - Hip prosthesis |  |
| ICD-9-CM Code: |  |
| Procedure Date**: 03/05/2008 |  |
| Location*: |  |
| Date Admitted to Facility*: |  |

---

After linking an SSI to its corresponding procedure, the remainder of the SSI form must still be completed and the record saved for linking to occur.

**Event Information**

| Event Type**: SSI - Surgical Site Infection | Date of Event**: 04/26/2008 |
| NHSN Procedure Code**: HPRO - Hip prosthesis |  |
| ICD-9-CM Code: |  |
| Procedure Date**: 03/05/2008 |  |
| Location*: 4 SOUTH - 4 SOUTH - SURGICAL |  |
| Date Admitted to Facility*: 03/05/2008 |  |
After clicking SAVE...

All data are linked together

Importing Procedures

You will need help from your IT staff to create the file that will pull data from your Operating Room data systems.

• Importing Patient Safety Procedure Data
  NHSN allows the importation of operative procedures. The following documents provide information on the procedure import process, including the required file specifications.
  - How to Import Patient Safety Procedure Data [PDF]
    - 0.8 MB May 2011
  - Patient Safety Procedure Data Import File Specifications [PDF - 182 KB]
    - February 2012
  - Sample Procedure Import File [CSV - 1 KB]
    - February 2012
Importing Procedures

Importing Patient Safety Procedure Data

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 field values, not within fields.

http://www.cdc.gov/nhsn/PDFs/ImportingProcedureData_current.pdf

Every field that is required on the Denominator for Procedure form is put into a column of the import document.
The following required fields on the Denominator for Procedure record are marked “optional for import”.

✓ For CSEC patient:
• Height
• Weight
• Duration of labor

If not imported electronically, these fields will still have to be entered into the system manually!

Importing Procedures

Note: If you create a “header row” with field names at the top, it must be deleted before the file is imported to NHSN!
In the NHSN application, select Import > Procedures and follow the instructions.

Additional Resources

- Mapping of ICD-9-CM Procedure Codes to NHSN Operative Procedure Categories
  http://www.cdc.gov/nhsn/XLS/ICD-9-cmCODEScurrent.xlsx

- Interactive Training Courses
  - Introduction to the Procedure-associated Module
  - SSI
Definitions of Surgical Site Infection

Superficial Incisional SSI

Infection occurs within 30 days after any NHSN operative procedure, including those coded as ‘OTH’ and involves only skin and subcutaneous tissues 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. superficial incision that is deliberately opened by a surgeon and is culture-positive or not cultured and patient has at least one of the following signs or symptoms: pain or tenderness; localized swelling; redness; or heat. A culture-negative finding does not meet this criterion.
d. diagnosis of superficial incisional SSI by the surgeon or attending physician.

http://www.cdc.gov/nhsn/XLS/ICD-9-cmCODEScurrent.xlsx
**SIP and SIS**

**Superficial incisional primary (SIP)**
A superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions.
Examples:
- C-section incision
- Chest incision for coronary artery bypass graft with a donor site [CBGB]

**Superficial incisional secondary (SIS)**
A superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision.
Example:
- Donor site incision for coronary artery bypass graft with a donor site [CBGB]

---

**Example**

Patient delivers a baby by C-Section on August 23. On her first postpartum visit to her surgeon on September 20, she notes yellow purulent drainage in the superficial incision.

Does Gretchen have a surgical site infection? **Yes**

Is it a superficial SSI? **Yes**

Is it an SIP or an SIS? **SIP**
Example

Patient underwent a coronary artery bypass graft (CBGB) in which the surgeon obtained a donor vessel from a site in Robert’s left leg.

5 days postoperatively, patient had pain and edema in the leg incision. The surgeon opened the superficial incision, drained the pus, and irrigated the wound.

Does Robert have a superficial incisional SSI? Yes

Is it a SIS or SIP? SIS

Deep Incisional SSI

A deep incisional SSI (DIP or DIS) must meet the following criterion:

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°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 operation, or by histopathologic or microbiologic examination.
d. diagnosis of a deep incisional SSI by a surgeon or attending physician.
Deep Incisional SSI

Infection occurs within 30 or 90 days after the NHSN operative procedure according to the list in Table 3 and involves deep soft tissues of the incision (e.g., 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 by a surgeon and is culture-positive or not cultured and patient has at least one of the following signs or symptoms: fever (>38°C); 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 an invasive procedure, or by histopathologic examination or imaging test
d. diagnosis of a deep incisional SSI by a surgeon or attending physician.

Rearranged

Deep incisional primary (DIP)
A deep incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions. Examples:
• C-section incision
• Chest incision for coronary artery bypass graft with a donor site [CBGB]

Deep incisional secondary (DIS)
A deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision. Example:
• Donor site incision for coronary artery bypass graft with a donor site [CBGB]
Reporting Instructions

- Classify infection that involves both superficial and deep incisional sites as deep incisional SSI

- Classify infection that involves deep incisional and organ/space sites as deep incisional SSI
  - This may change in 2014

Organ/Space SSI

An organ/space SSI must meet the following criterion:

- or 90 days after the NHSN operative procedure
- 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
  according to the list in Table 3
- infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure
- patient has at least one 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

and

meets at least one criterion of a specific organ/space infection site listed in Table 4.
Organ/Space SSI

Infection occurs within 30 or 90 days after the NHSN operative procedure and 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:

- a. purulent drainage from a drain that is placed 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, invasive procedure, or by histopathologic examination or imaging test
- d. diagnosis of an organ/space SSI by a surgeon or attending physician.

and meets at least one criterion of a specific organ/space infection site listed in Table 4.
Recap

- For any NHSN operative procedure, monitor for superficial SSI for 30 days only
- For selected NHSN operative procedures, monitor for deep incisional or organ/space SSI for either 30 days or 90 days (Table 3)

Organ/Space SSI

Table 4. Specific Sites of an Organ/Space SSI

<table>
<thead>
<tr>
<th>Code</th>
<th>Site</th>
<th>Code</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONE</td>
<td>Osteomyelitis</td>
<td>INT</td>
<td>Joint or bursa</td>
</tr>
<tr>
<td>BRST</td>
<td>Breast abscess or mastitis</td>
<td>LUNG</td>
<td>Other infections of the respiratory tract</td>
</tr>
<tr>
<td>CARD</td>
<td>Myocarditis or pericarditis</td>
<td>MED</td>
<td>Mediastinitis</td>
</tr>
<tr>
<td>DISC</td>
<td>Disc space</td>
<td>MEN</td>
<td>Meningitis or ventriculitis</td>
</tr>
<tr>
<td>EAR</td>
<td>Ear, mastoid</td>
<td>ORAL</td>
<td>Oral cavity (mouth, tongue, or gums)</td>
</tr>
<tr>
<td>EMET</td>
<td>Endometritis</td>
<td>OREP</td>
<td>Other infections of the male or female reproductive tract</td>
</tr>
<tr>
<td>ENDO</td>
<td>Endocarditis</td>
<td>OUTI</td>
<td>Other infections of the urinary tract</td>
</tr>
<tr>
<td>EYE</td>
<td>Eye, other than conjunctivitis</td>
<td>SA</td>
<td>Spinal abscess without meningitis</td>
</tr>
<tr>
<td>GIT</td>
<td>GI tract</td>
<td>SINU</td>
<td>Sinusitis</td>
</tr>
<tr>
<td>HEP</td>
<td>Hepatitis</td>
<td>UR</td>
<td>Upper respiratory tract</td>
</tr>
<tr>
<td>IAB</td>
<td>Intraabdominal, not specified else where</td>
<td>VASC</td>
<td>Arterial or venous infection</td>
</tr>
<tr>
<td>IC</td>
<td>Intracranial, brain abscess or dura</td>
<td>VCUF</td>
<td>Vaginal cuff</td>
</tr>
</tbody>
</table>
Exception to HAI Rule for Certain Organ/Space SSIs

- If a patient has an infection in the organ/space being operated on in the first 2-day period of hospitalization and the surgical incision was closed primarily, subsequent continuation of this infection type during the remainder of that hospitalization is considered an organ/space SSI, if organ/space SSI and site-specific infection criteria are met.
- Rationale: Risk of continuing or new infection considered to be minimal when surgeon elects to close a wound primarily.

Example

- On 8/1, patient presents to ED with acute abdomen and is admitted to the OR on the same day for colon resection (COLO). Peritoneal abscess noted at time of surgery. Incision is closed primarily with a JP drain in an adjacent stab wound.
- Even on antibiotics, patient continues to have low-grade fevers, abdominal pain, and purulent drainage via JP drain. Patient returned to OR on 8/6 for exploration and new abscesses were found.
- This is reported as an SSI-IAB.
Reporting Instructions

- In Chapter 9, the Reporting Instructions in the SSI criteria table, the Numerator Data section and the Table of Instructions provide important guidance on the many nuances of how to report SSI details in a variety of situations.
- The examples shown in this presentation are only some of them.
- Please read and follow all of the instructions carefully!

When a patient with an SSI has had more than one operation...

**Example:** Patient underwent a COLO on 2/12/13. Three days later, he went back to surgery to repair a leaking anastomosis (OTH). He developed an intraabdominal abscess on 2/28/13. This SSI is attributed to the second procedure (OTH), not the COLO.

If a patient has several NHSN operations prior to an SSI, report the operation that was performed most closely in time prior to the infection date.
If more than one operation is done through a single incision...

First, attempt to determine the procedure that is thought to be associated with the infection.

**Example:** If the patient had a CBGC and CARD done at the same time and develops an infected valve, then the SSI will be linked to the CARD.

If it’s not clear (as in the case of a superficial incisional SSI), use the NHSN Principal Operative Procedure Selection Lists to select which operative procedure to report.

### NHSN Principal Operative Procedure Category Selection Lists

- Five lists in Table 5
  - Abdominal operations
  - Thoracic operations
  - Neurosurgical (spine) operations
  - Neurosurgical (brain) operations
  - Neck operations
- Categories with the highest risk of SSI are listed before those with lower risks
  - In 2013, order is COLO, SB, REC; currently order is SB, REC, COLO
  - In 2013, HYST is still before VHYS
### Table 5. NHSN Principal Operative Procedure Category Selection Lists

<table>
<thead>
<tr>
<th>Priority</th>
<th>Code</th>
<th>Abdominal Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LTP</td>
<td>Liver transplant</td>
</tr>
<tr>
<td>2</td>
<td>COLO</td>
<td>Colon surgery</td>
</tr>
<tr>
<td>3</td>
<td>BILI</td>
<td>Bile duct, liver or pancreatic surgery</td>
</tr>
<tr>
<td>4</td>
<td>SB</td>
<td>Small bowel surgery</td>
</tr>
<tr>
<td>5</td>
<td>REC</td>
<td>Rectal surgery</td>
</tr>
<tr>
<td>6</td>
<td>KTP</td>
<td>Kidney transplant</td>
</tr>
<tr>
<td>7</td>
<td>GAST</td>
<td>Gastric surgery</td>
</tr>
<tr>
<td>8</td>
<td>AAA</td>
<td>Abdominal aortic aneurysm repair</td>
</tr>
<tr>
<td>9</td>
<td>HYST</td>
<td>Abdominal hysterectomy</td>
</tr>
<tr>
<td>10</td>
<td>CSEC</td>
<td>Cesarean section</td>
</tr>
<tr>
<td>11</td>
<td>XLAP</td>
<td>Laparotomy</td>
</tr>
<tr>
<td>12</td>
<td>APPY</td>
<td>Appendix surgery</td>
</tr>
<tr>
<td>13</td>
<td>HER</td>
<td>Herniorrhaphy</td>
</tr>
<tr>
<td>14</td>
<td>NEPH</td>
<td>Kidney surgery</td>
</tr>
<tr>
<td>15</td>
<td>VHYS</td>
<td>Vaginal Hysterectomy</td>
</tr>
<tr>
<td>16</td>
<td>SPLE</td>
<td>Spleen surgery</td>
</tr>
<tr>
<td>17</td>
<td>CHOL</td>
<td>Gall bladder surgery</td>
</tr>
<tr>
<td>18</td>
<td>OVRY</td>
<td>Ovarian surgery</td>
</tr>
</tbody>
</table>

continued...

<table>
<thead>
<tr>
<th>Priority</th>
<th>Code</th>
<th>Thoracic Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HTP</td>
<td>Heart transplant</td>
</tr>
<tr>
<td>2</td>
<td>CBGB</td>
<td>Coronary artery bypass graft with donor incision(s)</td>
</tr>
<tr>
<td>3</td>
<td>CBGC</td>
<td>Coronary artery bypass graft, chest incision only</td>
</tr>
<tr>
<td>4</td>
<td>CARD</td>
<td>Cardiac surgery</td>
</tr>
<tr>
<td>5</td>
<td>THOR</td>
<td>Thoracic surgery</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority</th>
<th>Code</th>
<th>Neurosurgical (Spine) Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RFUSN</td>
<td>Refusion of spine</td>
</tr>
<tr>
<td>2</td>
<td>CRAN</td>
<td>Craniotomy</td>
</tr>
<tr>
<td>3</td>
<td>FUSN</td>
<td>Spinal fusion</td>
</tr>
<tr>
<td>4</td>
<td>LAM</td>
<td>Laminectomy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority</th>
<th>Code</th>
<th>Neurosurgical (Brain) Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VSHN</td>
<td>Ventricular shunt</td>
</tr>
<tr>
<td>2</td>
<td>RFUSN</td>
<td>Refusion of spine</td>
</tr>
<tr>
<td>3</td>
<td>CRAN</td>
<td>Craniotomy</td>
</tr>
<tr>
<td>4</td>
<td>FUSN</td>
<td>Spinal fusion</td>
</tr>
<tr>
<td>5</td>
<td>LAM</td>
<td>Laminectomy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority</th>
<th>Code</th>
<th>Neck Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NECK</td>
<td>Neck surgery</td>
</tr>
<tr>
<td>2</td>
<td>THYR</td>
<td>Thyroid and or parathyroid surgery</td>
</tr>
</tbody>
</table>
SSI after Laparoscopic Procedure

- If more than one of the laparoscopic/robotic incisions becomes infected, report only one SSI
  - If one is a superficial incisional SSI and another is a deep incisional SSI, report as a deep incisional SSI

Completing the SSI Event Form (Numerator)
Reporting SSIs

Complete a Surgical Site Infection (SSI) form for each patient found to have an SSI using the definitions.

SSI Form – Patient Demographics

Required fields are highlighted
**SSI Form – Basic SSI Information**

- **Event Type:** SSI

- **Date of Event:** Required. The date when the last element used to meet the SSI criterion occurred.

- **Date of Procedure:** Required. Enter the date the operation was performed.

- **NHSN Procedure Code:** Required. Enter the NHSN Operative Procedure Code for the operation that was performed.
Reporting SSI for Patients who are Readmitted

- Use the admission date of the surgical admission as the Date Admitted to Facility, not the readmission date
- Then the Date of Procedure and Date of Event will be in the correct sequence

Date Admitted to Facility ≤ Date of Procedure < Date of Event

SSI Form – Basic SSI Information

Some procedures are only allowed as inpatients (e.g., solid organ transplants, open heart procedures, etc.)
SSI Form – MDRO Infection

*MDRO Infection Surveillance: [ ] Yes, this event’s pathogen & location are in-plan for the MDRO/CDAD Module

[ ] No, this event’s pathogen & location are not in-plan for the MDRO/CDAD Module

*Date Admitted to Facility: 04/24/2009

MDRO Infection: Required. If this SSI is an NHSN-defined MDRO infection that you are monitoring in your Monthly Reporting Plan, select Yes.

SSI Form – Basic SSI Information

Enter the date the patient was admitted to the hospital when the operation was performed (not the date of readmission) and the location where the patient was housed after leaving the OR / PACU.

Note: Location is an optional field for SSI!

Note: This is never a location or admission date associated with a readmission or a place where the patient may be after discharge (e.g., nursing home).
### SSI Form – Event Details

**Specific Event:** Required. Check the box to indicate the definition that was used to identify the SSI.

<table>
<thead>
<tr>
<th>Event Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Event:</td>
</tr>
<tr>
<td>☐ Superficial Incisional Primary (SIP)</td>
</tr>
<tr>
<td>☐ Superficial Incisional Secondary (SIS)</td>
</tr>
<tr>
<td>☐ Organ/Space (specific site): MED</td>
</tr>
<tr>
<td>☐ Deep Incisional Primary (DIP)</td>
</tr>
<tr>
<td>☐ Deep Incisional Secondary (DIS)</td>
</tr>
</tbody>
</table>

**Specify Criteria Used (check all that apply):**
- Laboratory
- Other

If the specific event is Organ/Space, specify the organ/space site that was identified. See Chapter 17.
SSI – Event Details

*Specify Criteria Used (check all that apply):

- Purulent drainage or material
- Pain or tenderness
- Localized swelling
- Redness
- Heat
- Fever
- Incision deliberately opened by surgeon
- Wound spontaneously dehiscence
- Abscess
- Hypothermia
- Apreia
- Bradycardia
- Lethargy
- Cough
- No
- Vomiting
- Diarrhea
- Other
- Other

Laboratory

- Positive culture
- Not cultured
- Positive blood culture
- Blood culture not done or no organisms detected in blood
- Positive Gram stain when culture is negative or not done
- Other positive laboratory tests
- Radiographic evidence of infection

Clinical Diagnosis

- Physician diagnosis of this event type
- Physician Institutes appropriate antimicrobial therapy

*Detected:

A SSI was identified before the patient was discharged from the facility following the operation

P SSI was identified only as part of post-discharge surveillance, including ED visit without readmission. If readmitted, use RF or RO as appropriate.

RF SSI was identified due to patient readmission to the facility where the operation was performed.

RO SSI was identified due to patient admission to a facility other than where the operation was performed.

Detected:

Required.

Check the box to indicate when/how the SSI was identified.
SSI – Event Details

Secondary BSI: Required. If the patient had a culture-confirmed bloodstream infection with a documented SSI, circle Yes.

Secondary BSI

- If the criterion met for the primary infection site requires a culture, then at least one organism from that site must match an organism in the blood culture (antibiograms of the isolates do not have to match).

  - Example: Patient grows *E. coli* in her deep incision and in her blood. The SSI is reported with a secondary BSI and the pathogen as *E. coli*.

http://www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf, App 1
Secondary BSI (cont.)

- If the criterion met for the primary infection site does not require a culture and the blood isolate is a logical pathogen for the site, report as secondary BSI.

Example: Postoperative patient had abscess in small bowel noted during reoperation. No specimens except blood taken; blood grew *Bacteroides fragilis*. The infection was reported as an SSI-GIT meeting criterion 1 (surgically-identified abscess), with a secondary BSI. The organism was reported as *B. fragilis*.

http://www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf, App 1

Secondary BSI Guide

- Besides the 2 examples just given, there are other scenarios in this guide that you will find helpful
  - Examples when blood and site-specific cultures do not match
  - Examples when blood is positive but site-specific culture is negative
- Definition of matching organism
- Additional notes and reporting instructions

http://www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf, App 1
**SSI – Event Details**

**Died:**
Required for completion.
If the patient died during this hospitalization, circle Yes.

**SSI Contributed to Death:**
Required only if the patient died.

If the SSI caused the death or exacerbated an existing condition which led to death, circle Yes.

**Discharge Date:**
Optional.
The date the patient was discharged from the hospital.
This is the hospitalization during which the operation was performed.

**Pathogens Identified:**
Required.
Circle Yes if one or more pathogens was identified.

Specific information about the pathogen is entered on the back of the form.
For each antimicrobial agent identified, circle the pathogen’s susceptibility result.

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Gram-positive Organisms</th>
<th>Coagulase-negative staphylococci (specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Enterococcus faecalis</th>
<th>Enterococcus faecium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Staphylococcus aureus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Enterobacter, K. oxytoca, P. mirabilis, E. coli, S. marcescens, P. aeruginosa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S = Susceptible  
I = Intermediate  
R = Resistant  
NS = Non-susceptible  
S-DD = Susceptible-dose dependent  
N = Not tested

Summary

- Complete and enter or import Surgical Site Infection records for the procedures that are selected for surveillance.
Analysis and Reports

1. Generate Data Sets

Data sets are being generated. Please wait...

PVacc_Events

The data set generation process will take several minutes. Do not logoff or close this window while the process is running. You may minimize the browser window and work in other applications while you wait.

2. Patient Safety Component

Analysis Output Options

- Device-Associated Module
- Procedure-Associated Module
- MDR0/CDI Module - Infection Surveillance
- MDR0/CDI Module - LAIBD Event Reporting
- MDR0/CDI Module - Process Measures
- MDR0/CDI Module - Outcome Measures
- Vaccination Module
- Advanced
- My Custom Output
- Published Output

3. Patient Safety Component

Analysis Output Options

- Device-Associated Module
- Procedure-Associated Module
- All Procedure-Associated Events
- SSI
  - CDC Defined Output
  - Line Listing - All SSI Events
  - Frequency Table - All SSI Events
  - Bar Chart - All SSI Events
  - Pie Chart - All SSI Events
  - SIR - Complex AR SSI Data by Procedure
  - SIR - Complex AR SSI Data by Surgeon
  - SIR - In-plan Complex AR SSI data by Procedure
  - SIR - In-plan Complex AR SSI data by Surgeon
  - SIR - All SSI Data by Procedure
  - SIR - All SSI Data by Surgeon
  - SIR - In-plan All SSI Data by Procedure
  - SIR - In-plan All SSI data by Surgeon
  - Line Listing - Incomplete Procedures for SSI SIR
Standardized Infection Ratio (SIR)

SIR = Number of observed infections (O) divided by the number of expected infections (E)

$$SIR = \frac{O}{E}$$
SIR

- A summary measure used to track HAIs at a national, state, other group, or local level over time
- Adjusts for patients of varying risk within each facility
- SIR compares the actual number of HAIs reported with the baseline U.S. experience (i.e., NHSN aggregate data are used as the standard population)
- An SIR >1.0 indicates that more HAIs were observed than predicted

SSI SIR

- Allows for all available risk factors to be considered
- Each factor’s “weight” varies according to its significant contribution to the risk of SSI for the procedure
- For all NHSN procedures, the models predicted SSI risk better than the basic risk index
Calculating E for SSI SIRs

- Using the parameter estimates from the logistic regression models, the probability of SSI for each patient is calculated and these are summed across patients to yield the expected number of SSIs (E).
- This is done for you in the NHSN analysis tool!
- See special edition of newsletter for details:

Predictive Risk Factors

<table>
<thead>
<tr>
<th>NHSN Operative Procedure</th>
<th>Risk Factor(s) – All SSIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Duration</td>
</tr>
<tr>
<td>CBGB/C</td>
<td>Age, ASA, duration, gender, number of beds*</td>
</tr>
<tr>
<td>COLO</td>
<td>Age, anesthesia, ASA, duration, endoscope, medical school affiliation*, number of beds*, wound class</td>
</tr>
<tr>
<td>FUSN</td>
<td>Approach, ASA, diabetes, duration, medical school affiliation*, spinal level, trauma, wound class</td>
</tr>
<tr>
<td>HPRO</td>
<td>Age, anesthesia, ASA, duration, HPRO type, number of beds* trauma</td>
</tr>
<tr>
<td>HYST</td>
<td>Age, anesthesia, ASA, duration, endoscope, number of beds*</td>
</tr>
<tr>
<td>KPRO</td>
<td>Age, anesthesia, ASA, duration, gender, KPRO type, number of beds*, trauma</td>
</tr>
<tr>
<td>LAM</td>
<td>Anesthesia, ASA, duration, endoscope</td>
</tr>
<tr>
<td>PVBY</td>
<td>Age, ASA, duration, gender, medical school affiliation*</td>
</tr>
<tr>
<td>RFUSN</td>
<td>Approach, diabetes, duration</td>
</tr>
<tr>
<td>VSHN</td>
<td>Age, medical school affiliation*, number of beds*, wound class</td>
</tr>
</tbody>
</table>

*Risk factors from Patient Safety Annual Facility Survey

SSI SIR Options in NHSN

All SSI SIR Model
- Includes superficial, deep and organ/space
- Superficial and deep SSIs limited to primary incisions only
- Includes SSIs identified on admission, readmission and via post-discharge surveillance

Complex A/R SSI Model
- Includes only SSIs identified on admission/readmission to facility where procedure was performed
- Includes only inpatient procedures
- Includes only deep incisional primary and organ/space SSIs

Complex 30-day SSI model (used for CMS IPPS)
- Includes only in-plan, inpatient COLO and HYST procedures in patients ≥18 years of age
- Includes only deep incisional primary and organ/space SSIs with an event date within 30 days of the procedure
- Uses only age and ASA to determine risk
During 2009, there were 524 procedures performed and 13 SSIs identified.

Based on the NHSN 2006-2008 baseline data, 6,687 SSIs were expected.

This results in an SIR of 1.94 (13/6.687), signifying that during this time period this facility identified 94% more SSIs than expected.

The p-value and 95% Confidence Interval indicate that the number of observed SSIs is significantly higher than the number of expected SSIs.

### Overall SSI SIR

<table>
<thead>
<tr>
<th>Org ID</th>
<th>Summary Yr</th>
<th>Procedure Count</th>
<th>infCountAll</th>
<th>All SSI Model Number Expected</th>
<th>All SSI Model SIR</th>
<th>All SSI Model SIR p-value</th>
<th>All SSI Model 95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>10018</td>
<td>2009</td>
<td>524</td>
<td>13</td>
<td>6.687</td>
<td>1.94</td>
<td>0.0196</td>
<td>1.150, 3.091</td>
</tr>
</tbody>
</table>

### SSI Rates

- Go to Advanced Output Options
- No comparative statistics
Questions: Email user support:
nhsn@cdc.gov
NHSN website:
http://www.cdc.gov/nhsn/