Agenda

- Introduction – odds and ends
- Device-associated Events
  - Denominators
  - CLABSI
  - CAUTI
  - VAP
- Surgical Site Infections (SSI)
  - Denominator for procedure
  - SSI
- *C. difficile* LabID Events
- Getting the data out – NHSN Basics
We will not discuss...

- Dialysis Events
- Central Line Insertion Practices (CLIP) Monitor
- Post-procedure pneumonia
- Patient vaccination
- Healthcare Personnel Safety Component
- Biovigilance Component
- MDRO Surveillance module


NHSN Facility Administrator Enrollment Guide

Step-by-step instructions for enrolling in NHSN

Every facility is unique

Locations
- MSICU
- ICU
- 6 West

Surgeons
- 101 John Smith
- 104 Greta Jones
- A13 Cochran, Randall

Users
- Mlandrus
- Jones 44
- lcp 45
Steps for setting up your facility

1. Complete enrollment
2. Receive email from CDC (Facility is activated)
3. Add users (if any)
4. Add locations
5. Add surgeons
6. Add Monthly Reporting Plan(s)

Location - Definition

The area to which a patient is assigned while receiving care in the healthcare facility.

NOTE: Only locations where patients are housed overnight (i.e., inpatient locations) and where denominator data are collected can be used when monitoring infections in the Device-associated Module. This means that operating rooms (including cardiac cath labs, c-section rooms, and interventional radiology) and outpatient locations are not allowed when monitoring Device-associated infections in the Monthly Reporting Plan.

CDC-defined Location

A CDC-defined designation given to a patient care area housing patients who have similar disease conditions or who are receiving care for similar medical or surgical specialties. Each facility location that is monitored is “mapped” to one CDC Location.

80% Rule: If 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location (in this case, an Inpatient Pediatric Orthopedic Ward).
### CDC Location Descriptions

<table>
<thead>
<tr>
<th>Location Label</th>
<th>Location Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realms Adult Critical Care</td>
<td>Critical care area specializing in the care of patients with significant health needs</td>
</tr>
<tr>
<td>Burn Critical Care</td>
<td>Critical care area specializing in the care of patients with severe burn injuries</td>
</tr>
<tr>
<td>Medical Intensive Care</td>
<td>Critical care area specializing in the care of patients with severe medical problems</td>
</tr>
<tr>
<td>Surgical Intensive Care</td>
<td>Critical care area specializing in the care of patients following major surgical procedures (e.g., cardiac and thoracic surgery)</td>
</tr>
<tr>
<td>Medical Critical Care</td>
<td>Critical care area for patients with acute and chronic medical conditions</td>
</tr>
<tr>
<td>Medical/Gastrointestinal Critical Care</td>
<td>Critical care area specializing in the care of patients with gastrointestinal conditions</td>
</tr>
</tbody>
</table>

### Help Messages

- **NHSN** National Healthcare Safety Network
- **APIC** Association for Professionals in Infection Control
- **SPEAR** Saving Lives - Reducing Risk - Protecting Your Bottom Line

### Add Monthly Reporting Plan

**Mandatory fields marked with **

- **Facility ID**: CHLA Memorial Hospital (ID 10000)
- **Month**: 3
- **Year**: 2012
- **No NHSN Patient Safety Module Followed this Month**

**Device-Associated Modules**

- **CLA SSI DE VA CI UTI CLIP**

**Procedure-Associated Modules**

- **Antimicrobial**
- **Post-procedure**
Add Monthly Reporting Plan

Welcome to the NHSN Online Manual!

The NHSN Online Manual that guides the NHSN user through the definitions, reporting instructions, and capabilities relevant to the NHSN application. In an effort to ensure standardization of data collection and reporting procedures, considerable detail is provided throughout this help system.
How Data are Shared using NHSN

Each hospital enrolls in NHSN separately

How Data are Shared using NHSN

One hospital in NHSN nominates a Group, names it, and appoints a Group Administrator

Other hospitals join the group by invitation

How Data are Shared using NHSN

The Group Administrator creates a template of data rights that will be accepted by Group members
How Data are Shared using NHSN

A hospital can join more than one Group
Rights to specific data are conferred to each group separately

STATE GROUP
- CLABSI (all ICUs)

CITY GROUP
- CLABSI (all locations)
- VAP

CORPORATE GROUP
- SSIs (HYST and APPY)
- CLABSI (all locations)
- CAUTI (all locations)

CMS Reporting

NHSN will automatically share your data with CMS. There is no CMS “Group” that must be joined! If your hospital participates in the Medicare – Medicaid program, NHSN will send the required data to CMS if they are in your Monthly Reporting Plan

CMS Reporting via NHSN Current and Proposed Requirements (as of 11/14/2011)

<table>
<thead>
<tr>
<th>HAI Event</th>
<th>Facility Type</th>
<th>Reporting Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI</td>
<td>IPSS Acute Care Hospitals</td>
<td>January 2011</td>
</tr>
<tr>
<td>CAUTI</td>
<td>IPSS Acute Care Hospitals</td>
<td>January 2012</td>
</tr>
<tr>
<td>SSI</td>
<td>IPSS Acute Care Hospitals</td>
<td>January 2012</td>
</tr>
<tr>
<td>CAUTI</td>
<td>IPSS Acute Care Hospitals</td>
<td>January 2012</td>
</tr>
<tr>
<td>MRSA Bacteremia</td>
<td>IPSS Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>C. Difficile</td>
<td>IPSS Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>HCAI Influenza Vaccination</td>
<td>ASCU</td>
<td>October 2014</td>
</tr>
<tr>
<td>SSI (Percutaneous)</td>
<td>IPSS Acute Care Hospitals</td>
<td>January 2014</td>
</tr>
</tbody>
</table>

* Long Term Care Hospitals are called Long Term Acute Care Hospitals in NHSN
Does a hospital have to submit these data to both CMS and NHSN?
No, CDC will share the data with CMS.

Remember, only "in plan" data will be shared with CMS. It is the responsibility of each facility to check its monthly reporting plans to make sure they include the necessary events and locations and/or procedures in order to comply with the CMS reporting requirements.

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**DEVICE-ASSOCIATED EVENTS**


class
CAUTI
VAP

---

**Steps for setting up your facility**

1. Complete enrollment
   - Receive email from CDC (Facility is activated)

2. Add users (if any)

3. Add locations

4. Add surgeons

   - Add Monthly Reporting Plan(s)
Monthly Reporting Plan
Device-associated Events

• Your way of telling CDC which of your data to use
• CDC will use the data you specify in your plan when the aggregate is calculated

You can generate the Monthly Reporting Plan on the form, or directly into NHSN

Add Monthly Reporting Plan

Important Note!
You will not be allowed to enter any data into NHSN for a month that has no Plan.

From the blue navigation bar, select Reporting Plan then Add

Add Monthly Reporting Plan

Mandatory fields marked with *
Facility ID:
Month:
Year:

Select the Month and Year for the Plan
Monthly Reporting Plan – DA Module

First, choose the location(s) where you will monitor the event
Then choose which events you will monitor in each selected location

Denominators (Summary Data)

- Train someone on the floor to collect summary data
- At the same time each day, count:
  - the number of patients on the unit
  - the number of patients with one or more of the devices you’re collecting

Counting Patient Days

- At the same time each day, count the number of patients on the unit.
- In NICU’s, patients are counted separately for each birthweight category.
- Do not count patients who have not yet been admitted.
- Do not count patients who have been discharged.
- Do count patients who may be off the floor for tests (e.g., radiology, surgery, etc.) at the time the count is done.
- The total is recorded in NHSN at the end of the month.
Locations – where DA events can be monitored

- Intensive Care Unit (ICU)
- Neonatal Intensive Care Unit (NICU)
- Specialty Care Areas (SCA)
  - Hematology/Oncology
  - Bone Marrow Transplant
  - Solid Organ Transplant
  - Inpatient/Acute Dialysis
  - Long-term Acute Care
- Other inpatient locations where patients are housed overnight and where denominator data are collected

ICU/Other Locations Denominator Form

- Used for critical care locations
- Used for step down units
- Used for other patient care wards
  - Examples:
    - Medical-surgical
    - Orthopedic
    - OB/GYN
- Is not used for NICU or SCA locations

Example

- A surgical ICU (SICU) has 16 beds. Today, when patient days are counted (4 pm), there are 8 medical patients and 7 surgical patients.
- For this unit today, 15 patients are recorded on the Denominator for ICU/Other Locations form.
- Totals recorded in NHSN at the end of the month.
Counting Device Days

• At the same time each day, count the number of patients with one or more of the devices you are monitoring

Example: There are 6 patients on Medical Ward. 3 of the patients have a PICC line and one additional patient has both a PICC line and a Swan Ganz catheter. The number of Central Line days for the Medical Ward is 4

Example: There are 8 patients in the CTICU at 2 pm. 2 of the patients are on ventilators. The number of ventilator days for the CTICU today is 2.

Examples:

James

James is admitted today at 6 am and an indwelling urethral catheter is inserted. At noon today, one catheter day is counted.

Cathy

Cathy had an indwelling catheter inserted at the time of her cesarean section. It was removed at 11 am this morning. She was unable to void following the removal of the catheter and a new Foley was inserted at 3:30 pm. At noon today, zero catheter days are recorded for Cathy.

Example of Summary Data

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of patients</th>
<th>Number of patients with one or more central lines</th>
<th>Number of patients with a urinary catheter</th>
<th>Number of patients on ventilator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Note: collect only those device days that are monitored.
SCA Locations Denominator form

- Used to collect denominator data in SCA locations
  - Bone marrow/stem cell transplant
  - Solid organ transplant
  - Inpatient dialysis
  - Hematology/oncology
  - Long Term Acute Care
- For CLABSI, temporary and permanent central lines are collected separately
- If a patient has both a permanent and a temporary line, count only the temporary line

NICU Locations Denominator Form

- Used to collect patient days and device days for Level III and combination I/III nurseries
- All data are collected by five birthweight categories
  - Umbilical line days and non-umbilical central days are collected separately
  - CAUTI is not monitored in NICU location — indwelling urinary catheter days are not collected

Example of Summary Data — NICU

- Urinary catheter days may now be collected in NICU locations
- Separated by Birthweight category
Electronic Collection of Denominators

When denominator data are available from electronic databases (e.g., ventilator days from respiratory therapy), these sources may be used as long as the counts are not substantially different (+/- 5%) from manually collected counts (3 months).

### MSICU - Wednesday, November 28, 2007 10:00 am

<table>
<thead>
<tr>
<th>Room #</th>
<th>Name</th>
<th>Urinary catheter</th>
<th>IV line</th>
<th>Ventilator</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Mrs. Jones</td>
<td>CVC – Jugular</td>
<td>IPPB q 4 hr</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Miss Scarlett</td>
<td>CVC – Femoral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>203</td>
<td>Mr. Green</td>
<td>Suprapubic to dd</td>
<td>Swan gag</td>
<td>PICC</td>
</tr>
<tr>
<td>204</td>
<td>Mrs. White</td>
<td>Foley to dd</td>
<td>PI X 2</td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>Col. Mustard</td>
<td>Foley out 9:00 am</td>
<td>PI X right vent</td>
<td>CVC – Jugular</td>
</tr>
<tr>
<td>206</td>
<td>Mrs. Doubtfire</td>
<td></td>
<td>Weaning (off vent)</td>
<td></td>
</tr>
<tr>
<td>207</td>
<td>Mr. Jackson</td>
<td>Cath for spec.</td>
<td>PI X right vent</td>
<td>IPPB q 4 hr</td>
</tr>
<tr>
<td>208</td>
<td>Mr. Blue</td>
<td>Foley to dd</td>
<td>CVC – Subclavian</td>
<td>Vent cont.</td>
</tr>
<tr>
<td>209</td>
<td>Mrs. Smith</td>
<td>Straight cath pm</td>
<td>PICC</td>
<td>Vent - Extubated at 10:30 am - on room air</td>
</tr>
<tr>
<td>210</td>
<td>Miss Brown – transferred from MSICU at 9 am</td>
<td>Foley to dd</td>
<td>PICC</td>
<td></td>
</tr>
</tbody>
</table>

### Definition: Healthcare-associated Infection (HAI)

A localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s).

There must be no evidence that the infection was present or incubating at the time of admission to the acute care setting.
Sources of Infection
• HAI may be caused by infectious agents from endogenous or exogenous sources

Endogenous sources are body sites, such as the skin, nose, mouth, gastrointestinal (GI) tract, or vagina that are normally inhabited by microorganisms.

Exogenous sources are those external to the patient, such as patient care personnel, visitors, patient care equipment, medical devices, or the health care environment.

Surveillance Definitions
• Combination of different types of evidence

Radiologic
Laboratory
Clinical signs/symptoms

Other considerations
Clinical Criteria
(Physician)
• Individualized to the patient
• Designed to provide diagnosis and treatment

Surveillance Definitions
(Infection Preventionist)
• Population-based
• Consistently used uniformly over time
Contamination and Colonization

- Not considered “present or incubating”
- Do not cause adverse clinical symptoms even though organisms are present

**Contamination Example:**
Patient with abdominal trauma with gross spillage of bowel contents. If infection develops it is an HAI.

**Colonization Example:**
Patient who screens positive with MRSA in nares on admission. If infection develops it is an HAI.

New infection? Extension of old infection?

- Look for evidence of resolution
- Change in pathogen, by itself, is not enough to call it a new infection

Secondary BSI

- A culture-confirmed BSI associated with a documented HAI at another site
- If the primary infection is cultured, the Secondary BSI must yield culture of the same organism and exhibit the same antibiogram as the primary HAI site
- If a culture is not used to meet the criteria for a primary HAI, and the blood culture grows an appropriate organism, the BSI is secondary and the organism grown is reported for the primary HAI
Examples of Secondary BSI

- A patient with an indwelling urinary catheter and a central line has a fever on day 2 following admission. He grows *E. coli* in a urine culture. A blood culture grows the same *E. coli* organism. A UTI is reported with the organism *E. coli*. A secondary BSI is reported on the UTI form.

- On postoperative day 4, a COLO patient grows *E. faecium* in a blood culture. A CT scan of the abdomen reveals an abscess in the peritoneum. SSI-GIT is reported with the organism *E. faecium*. A secondary BSI is reported.

Secondary BSI (cont.)

- Mr. Brown has a PICC line. His physician documents that he has a urinary tract infection not associated with an indwelling catheter. No urine culture is done, but a urinalysis is positive for nitrites. On the same day, Mr. Brown has a blood culture which grows MRSA.

- A CLABSI is reported with *S. aureus* (MRSA) as the organism.

Positive blood culture

Does patient meet the criteria for HAI at another site? (If infection is CA, or if NHSN criteria for the specific site HAI has not been met, answer "No".)

- No
- CA or HA
  - HA
  - CA

Is blood isolate a common pathogen for this site?

- Yes
- No

This CA infection with secondary BSI is not reported through NHSN nor is the BSI.

Site infection with secondary BSI

Primary BSI

Primary BSI
**Methodology:**

**How Data are Collected**

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>Trained ICPs look for and identify infections</td>
</tr>
<tr>
<td>Patient-based</td>
<td>Not based entirely on laboratory data</td>
</tr>
<tr>
<td>Prospective</td>
<td>Monitoring patients while still in the hospital</td>
</tr>
<tr>
<td>Priority-directed</td>
<td>Objectives for surveillance are defined and focused on specific events</td>
</tr>
</tbody>
</table>

**Methodology**

**How Rates are Calculated**

<table>
<thead>
<tr>
<th>Rate Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-adjusted</td>
<td>Rates are controlled for variations in the distribution of major risk factors</td>
</tr>
<tr>
<td>Expressed as Incidence Rates</td>
<td>New events in a population during a specific time period</td>
</tr>
<tr>
<td>Standardized Infection Ratios</td>
<td>Adjusts for patients of varying risk within each facility</td>
</tr>
</tbody>
</table>

**Central Line-associated Bloodstream Infection (CLABSI)**
Introduction – CLABSI

- 250,000 CLABSI occur in the United States each year
- Increased length of hospital stay
- Increased cost; the non-inflation-adjusted attributable cost of CLABSI has been found to vary from $3,700 to $29,000 per episode

Device-associated Module

- Central Line-associated BSI (CLABSI)
- Central Line Insertion Practices (CLIP)
- Ventilator-associated Pneumonia (VAP)
- Catheter-associated urinary tract infection (CAUTI)
- Dialysis Event (DE)
CLABSI – Terms and Definitions

Use CDC Definitions for the following:
- CLABSI
- Central Line
- Infusion
- Transfer Rule
- Types of Central Lines
- Bloodstream Infection
  - LCBI
    - Criterion 1
    - Criterion 2
    - Criterion 3

CLABSI Definition

Central Line-Associated Bloodstream Infection (CLABSI) is a primary bloodstream infection (BSI) in a patient that had a central line within the 48-hour period before the development of the BSI.

NOTE: There is no minimum time period that the central line must be in place in order for the BSI to be considered central line-associated.

Definition: Central Line

A vascular infusion device that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring.

The following are considered great vessels for the purpose of reporting central line infections and counting central line days:
- Aorta
- Pulmonary artery
- Superior vena cava
- Inferior vena cava
- Brachiocephalic veins
- Aorta
- Pulmonary artery
- Superior vena cava
- Inferior vena cava
- Brachiocephalic veins
- Internal jugular veins
- Subclavian veins
- External iliac veins
- Common iliac veins
- Femoral veins
Additional information about central lines

• In neonates, the umbilical artery is considered a great vessel
• Pacemaker wires and other non-lumened devices inserted into central blood vessels or the heart are not considered central lines, because fluids are not infused, pushed, nor withdrawn through such devices.
• An introducer is considered an intravascular catheter.
• Intraaortic balloon pumps (IABP) are not central lines
• Extracorporeal membrane oxygenation (ECMO) and femoral artery catheters are not central lines.

Definition: Infusion

- Introduction of a solution through a blood vessel via a catheter lumen
- Includes:
  - Continuous infusions such as nutritive fluids or medications, or
  - Intermittent infusions such as flushes or IV antimicrobial administration
  - Administration of blood or blood products in the case of transfusion or hemodialysis

Transfer Rule

- If the BSI develops in a patient within 48 hours of transfer from one inpatient location to another, indicate the transferring location on the infection report.

Example: Jane Smith is a patient in the Surgical ICU. On Tuesday her central line is removed and she is transferred to the GI Medical Ward. She develops a bloodstream infection on Wednesday afternoon. This is a CLABSI which is reported to the Surgical ICU.

- NOTE: It is not required to monitor for CLABSIs after the patient is discharged from the facility. However, if discovered, they should be reported to NHSN. No additional central line days are recorded.
Types of Central Lines

- **Temporary** – A central line that is nontunneled
- **Permanent** – includes
  - Tunneled catheters including certain dialysis catheters
  - Implanted catheters (including ports)
- **Umbilical Catheter** – central vascular device inserted through the umbilical artery or vein in a neonate

BSI Definitions

- Use Primary Bloodstream Infection (BSI) form for each potential CLABSI record that reviewed.
- The specific type of BSI will be:
  - Laboratory-confirmed Bloodstream Infection (LCBI) - can be used for any patient, including patients ≤ 1 year of age

Laboratory-confirmed Bloodstream Infection (LCBI)

**LCBI Criterion 1**

Patient has a **recognized pathogen** cultured from **one or more blood cultures** and organism cultured from blood is not related to an infection at another site
Notes about Criterion 1

The term "recognized pathogen" does not include organisms considered common commensals.

Examples of "recognized pathogens":
- Enterococcus spp.
- E. coli
- Pseudomonas spp.
- Klebsiella spp.
- Candida spp.

The phrase, "one or more blood cultures" means that at least one bottle from a blood draw is reported by the laboratory as having grown organisms (i.e., is a positive blood culture).

Laboratory-confirmed bloodstream infection (LCBI)

LCBI Criterion 2

Patient has at least one of the following signs or symptoms: fever (≥38°C), chills, or hypotension and signs and symptoms and positive laboratory results are not related to an infection at another site and common commensal is cultured from two or more blood cultures drawn on separate occasions.

Common commensal
- Diphtheroids
- Bacillus spp. (not B.anthracis)
- Propionibacterium spp.
- Coagulase-negative staphylococci (including S. epidermidis)
- Viridans group streptococci
- Aerococcus spp.
- Micrococcus spp.

Two or more blood cultures on separate occasions

"Two or more blood cultures drawn on separate occasions" means
1. Blood from at least 2 blood draws were collected within two days of each other and
2. At least one bottle from each draw is reported as having grown the same common commensal.
"Sameness" of organism

If the common commensal is identified to the species level from one culture, and a companion culture is identified with only a descriptive name (i.e., to the genus level), this it is assumed that the organisms are the same.

Example: If a culture grows *Staphylococcus epidermidis* and a companion culture grows *Coagulase-negative staphylococci*, then you can report that the common commensals are the same and that they are *S. epidermidis*.

Only genus and species identification should be utilized to determine the sameness of common commensals. No additional comparative methods should be used (e.g., morphology or antibiograms) because laboratory testing capabilities and protocols may vary between facilities.

This will reduce reporting variability, solely due to laboratory practice, between facilities reporting LCBIs meeting criterion 2. Report the organism to the genus/species level only once, and if antibiogram data are available, report the results from the most resistant panel.

Examples of how to report speciated and unspeciated common commensals

<table>
<thead>
<tr>
<th>Culture Report</th>
<th>Companion Culture Report</th>
<th>Report as...</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>S. Epidermidis</em></td>
<td>Coagulase-negative staphylococci</td>
<td><em>S. epidermidis</em></td>
</tr>
<tr>
<td>Bacillus spp. (not anthracis)</td>
<td><em>B. Cereus</em></td>
<td><em>B. Cereus</em></td>
</tr>
<tr>
<td><em>S. Salivarius</em></td>
<td><em>Strep viridans</em></td>
<td><em>S. salivarius</em></td>
</tr>
</tbody>
</table>
Blood Culture Specimen Collection

Ideally, blood specimens for culture should be obtained from two to four blood draws from separate venipuncture sites, not through the vascular catheter. These blood draws should be performed simultaneously or over a very short period of time (i.e., within a few hours).

If your facility does not currently obtain specimens using this technique, you may still report BSIs using these criteria, but you should work with appropriate personnel to facilitate better specimen collection practices for blood cultures.

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Laboratory-confirmed bloodstream infection (LCBI) LCBI Criterion 3

Patient <= 1 year of age has at least one of the following signs or symptoms: Fever (>38°C core), hypothermia (<36°C C. Core), apnea, or bradycardia

and

signs and symptoms and positive laboratory results are not related to an infection at another site and

Common commensal

- Diphtheroids (Corynebacterium spp.)
- Bacillus spp. (not B.anthracis)
- Propionibacterium spp.
- Coagulase-negative staphylococci (including S. epidermidis)
- Viridans group streptococci
- Aerococcus spp.
- Micrococcus spp.

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Primary Bloodstream Infection (BSI)
If the patient location is ICU, check here if the patient had a central line (within the previous 48 hours).

If the patient location is SCA, check here if the patient had a permanent central line or temporary central line (within the previous 48 hours).

If the location of the event (BSI) is NICU, answer the question about the presence of a central line.

The birth weight should also be completed if the patient is in the NICU.
Complete the inpatient or outpatient location where the central line was inserted and the date of insertion.

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NICU Other locations, Central line: Yes No</td>
<td>Location of Device Insertion:</td>
</tr>
<tr>
<td>Specialty Care Area:</td>
<td></td>
</tr>
<tr>
<td>Permanent central line: Yes No</td>
<td>Date of Device Insertion:</td>
</tr>
<tr>
<td>Temporary central line: Yes No</td>
<td></td>
</tr>
<tr>
<td>Birth weight (grams):</td>
<td></td>
</tr>
</tbody>
</table>

Event Details:

Check the appropriate boxes to indicate which of the criteria were met.

**Specific Event: Laboratory-confirmed**

- **Specific Criteria (check all that apply):**
  - Signs & Symptoms (check all that apply)
    - Fever
    - Chills
    - Hypertension
    - Bradycardia
  - Other

**Laboratory (check one):**

- Recognized pathogen from one or more blood cultures
- Common skin contaminant from ≥2 blood cultures

**Gram-positive organisms and antibiotic susceptibilities**

**Gram-negative organisms and antibiotic susceptibilities**

**Other organisms and antibiotic susceptibilities**
Antimicrobial Susceptibility

Select susceptibility pattern for each antimicrobial agent using the following scale:

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

Circle Yes if the patient died during this hospitalization.

Circle Yes if the patient died directly as a result of the BSI or if the BSI was a contributing factor to the patient death.

Optional field. Date of patient discharge.

If patient has BSI, this will always be Yes

QUESTIONS?
Catheter-associated Urinary Tract Infection (CAUTI)

Device-associated Module

Central Line-associated BSI (CLABSI)
Central Line Insertion Practices (CLIP)
Ventilator-associated Pneumonia (VAP)

Dialysis Event (DE)

Catheter-associated urinary tract infection (CAUTI)

Introduction – Urinary Tract Infections and Indwelling Urinary Catheters

- The urinary tract is the most common site of HAI
- Almost all UTIs are directly related to catheterization of the urinary tract
- CAUTI can lead to complications such as pyelonephritis or bacteremia
CLABSI – Terms and Definitions

- Use CDC NHSN definitions for the following:
  - CAUTI
  - Indwelling urinary catheter
  - CAUTI
    - Symptomatic UTI (SUTI)
    - Asymptomatic Bacteremic UTI (ABUTI)

Definition: CAUTI

UTI that occurs in a patient who had an indwelling urethral catheter in place at the time of or within the 48-hour period before the onset of the UTI

NOTE: There is no minimum time period that the catheter must be in place in order for the UTI to be considered ventilator-associated.
Definition: Indwelling Catheter

- A drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system.
  - Also called a Foley catheter
  - Does not include straight in and out catheters
  - Does not include suprapubic or nephrostomy catheters

Transfer Rule

- If the CAUTI develops in a patient within 48 hours of transfer from one inpatient location to another, indicate the transferring location on the infection report.

Example: Mr. Doe is a MICU patient. His foley catheter is removed on Thursday and he is transferred to the Orthopedic Ward on Saturday. Sunday evening he meets the criteria for SUTI. This is reported as a CAUTI and the location is the Orthopedic Ward.

NOTE: It is not required to monitor for CAUTIs after the patient is discharged from the facility. However, if discovered, they should be reported to NHSN. No additional catheter days are recorded.

Symptomatic Urinary Tract Infection (SUTI) Definitions

- Indwelling catheter in place at the time of specimen collection
- Patient had an indwelling catheter discontinued within 48 hours prior to specimen collection
- Patient with no catheter in place at the time of specimen collection or within 48 hours prior to specimen collection
Example:
Charles Green began to experience suprapubic pain the day following the insertion of a foley catheter. A urine culture shows $>10^5$ CFU/cc Klebsiella oxytoca. 
Reported as a CAUTI
Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

- Patient with or without an indwelling catheter
- Can be used with patients that are unable to verbalize symptoms
- Requires that a blood culture and urine culture are both collected
Uropathogens
Defined by NHSN
- Gram-negative bacilli
- *Staphylococcus* spp.
- Yeasts
- Beta-hemolytic *Streptococcus* spp.
- *Enterococcus* spp.
- *G. vaginalis*
- *Aerococcus urinae*
- *Corynebacterium* (urease positive)

CAUTI Criteria
- SUTI
  - Indwelling catheter
  - Positive urine culture
  - Signs/Symptoms
- ABUTI
  - Indwelling catheter
  - Positive urine culture
  - No signs/symptoms
  - Matching blood culture

Specimen Collection
Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate urine preservative. Refrigerated specimens should be cultured within 24 hours.
Indicate here the status of the urinary catheter, the location and date of insertion.

Check here if one of these criteria for UTI were met

- Frequency
- Urgency
- Dysuria
- Suprapubic tenderness
- Palpable kidney
- Ureteral tenderness
- Abnormal
- Pain or tenderness
- Persistent drainage or material
- Other evidence of infection found on direct exam, culture, or other tests

Laboratory & Diagnostic Testing
- 2 or more + on WBC or more than 2 species of microorganisms
- Positive dipstick for nitrite, leukocytes or reactivity
- Positive urine culture
- Microorganisms seen on Gram stain of unprocessed
- Positive culture for at least 2 species of microorganisms
- Positive culture for at least 2 species of microorganisms
- Positive culture for at least 2 species of microorganisms
- Positive culture for at least 2 species of microorganisms
- Positive culture for at least 2 species of microorganisms
- Positive culture for at least 2 species of microorganisms
- Positive culture for at least 2 species of microorganisms
- Positive culture for at least 2 species of microorganisms
Check each of the specific UTI criteria that were met:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td></td>
</tr>
<tr>
<td>Rigors</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Diaphoresis</td>
<td></td>
</tr>
<tr>
<td>Skin/tissue detection</td>
<td></td>
</tr>
<tr>
<td>Urine output alteration</td>
<td></td>
</tr>
<tr>
<td>Other symptoms</td>
<td></td>
</tr>
<tr>
<td>Laboratory &amp; diagnostic findings</td>
<td></td>
</tr>
<tr>
<td>2 positive cultures with a pH of 7.0 and &lt; 10^9 organisms/mL</td>
<td></td>
</tr>
<tr>
<td>Microorganisms seen on Gram stain of urine</td>
<td></td>
</tr>
<tr>
<td>Positive blood cultures</td>
<td></td>
</tr>
<tr>
<td>Radiographic evidence of infection</td>
<td></td>
</tr>
</tbody>
</table>

If this UTI also demonstrates a documented secondary BSI, circle Yes. Otherwise, circle No.

**Important Note!**

If the specific UTI event type is ABUTI, secondary BSI must be Yes.

**Ventilator-associated Pneumonia (VAP)**

Ventilator-Associated Pneumonia (VAP) is a significant source of healthcare-associated infections (HAIs). It is defined as pneumonia occurring in patients who have been mechanically ventilated for at least 48 hours or who have been intubated for at least 96 hours. VAP is a serious complication that can lead to prolonged hospitalization, increased mortality rates, and higher treatment costs. Prevention strategies include proper insertion and management of endotracheal tubes, adequate hydration, and the use of prophylactic antibiotics.
Device-associated Module

- Central Line-associated BSI (CLABSI)
- Central Line Insertion Practices (CLIP)
- Ventilator-associated Pneumonia (VAP)
- Catheter-associated urinary tract infection (CAUTI)
- Dialysis Event (DE)

Introduction – Ventilator-associated Pneumonia (VAP)

- Pneumonia -- 15% of all hospital-associated infections
- 27% of all infections acquired in the critical care areas of acute care hospitals
- PNEU - second most common hospital-associated infection after that of UTI
- The primary risk factor -- mechanical ventilation (with its requisite endotracheal intubation).

Monthly Reporting Plan – Device-associated Events
Locations – Where VAP Events Can be Monitored

- Intensive Care Unit (ICU)
- Neonatal Intensive Care Unit (NICU)
- Specialty Care Areas (SCA)
- Other inpatient locations where patients are housed overnight and where denominator data are collected

Example of Summary Data

Each day, at the same time each day, collect the number of patients on a ventilator

VAP – Terms and Definitions

- Use CDC Definitions for the following:
  - VAP
  - Ventilator
  - PNU1
  - PNU2
  - PNU3

NHSN Manual
Chapter 6
Definition: VAP

- A pneumonia (PNEU) that occurs in a patient who was intubated and ventilated at the time of or within 48 hours before the onset of the pneumonia.

NOTE: There is no minimum time period that the ventilator must be in place in order for the pneumonia to be considered ventilator-associated.

Definition: Ventilator

- A device to assist or control respiration continuously, inclusive of the weaning period, through a tracheostomy or by endotracheal intubation.

NOTE: Lung expansion devices such as intermittent positive-pressure breathing (IPPB); nasal positive end-expiratory pressure (PEEP); and continuous nasal positive airway pressure (CPAP or hypoCPAP) are not considered ventilators unless delivered via tracheostomy or endotracheal intubation (e.g., ET-CPAP).

Pneumonia Definitions

- **PNU1**: Clinically defined pneumonia
- **PNU2**: Pneumonia with common bacterial pathogen
- **PNU2**: Pneumonia with Viral, Legionella, etc. pathogen
- **PNU3**: Pneumonia in immunocompromised patients

Pneumonia criteria are based on the following types of criteria:
1. X-ray
2. Clinical signs and symptoms
3. Laboratory

Follow pneumonia flow diagram for definitions
PNU1 – Clinically-defined Pneumonia

X-Ray findings

Patient with underlying disease has X-ray radiologic x-ray with one of the following:
- New or progressive and persistent infiltrate
- Consolidation
- Cavitation
- Pneumatocele, in <1 y.o.

or

Patient without underlying disease has no new non-cardiac x-ray with one of the following:
- New or progressive and persistent infiltrate
- Consolidation
- Cavitation
- Pneumatocele, in <1 y.o.

PNU1 – Clinically-defined Pneumonia

Signs and Symptoms

At least one of the following:
- Fever (>38°C/100.4°F) with no other cause
- Leukopenia (<4,000 WBC/mm³) or leukocytosis (≥12,000 WBC/mm³)
- Altered mental status with no other cause, in ≥ 70 y.o.

and

PNU1 – Clinically-defined Pneumonia

Signs and Symptoms

At least two of the following:
- New onset of purulent sputum, change in character of sputum, or ↑ suctioning requirements
- New onset or worsening cough, or dyspnea, or tachypnea
- Rales or bronchial breath sounds
- Worsening gas exchange (e.g., O₂ desaturation, etc., PaO₂/FiO₂ <260), ↑ O₂ requirements, or ↑ ventilation demand

and

= PNU1
PNEU 1 - Clinically defined pneumonia

Alternate descriptive language

"air-space disease"

"focal opacification"

"patchy areas of increased density"

Describing chest x-ray information

Other non-infectious conditions may look like pneumonia:
- Congestive heart failure
- Pulmonary edema

Pneumonia may have rapid onset and progression, but does not resolve quickly. X-ray changes of pneumonia persist for several weeks.

Rapid resolution of chest x-rays suggests the patient does not have pneumonia.

To help confirm difficult cases, examine serial chest x-rays on several consecutive days.
PNU1 – Clinically-defined Pneumonia

ALTERNATE CRITERIA FOR INFANTS ≤1 YEAR OLD

X-Ray findings – exactly the same as for adults

- At least three of the following:
  - Temperature instability, with no other recognized cause
  - Leukopenia (<4000 WBC/mm³) or leukocytosis (>15,000 WBC/mm³) and blood (>10% band forms)
  - New onset of purulent sputum or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements
  - Agnosia, tachypnea noted flaring with retraction of chest wall or grunting
  - Wheezing, rales, or rhonchi
  - Cough
  - Bradycardia (<90 beats/min) or tachycardia (>170 beats/min)

PNEUMONIA FLOW DIAGRAM

ALTERNATE CRITERIA FOR INFANTS AND CHILDREN

X-Ray findings – exactly the same as for adults

At least three of the following:

- Fever (>38.4°C or >101.1°F) or hypothermia (<36.5°C or <97.7°F) with no other recognized cause
- Leukopenia (<4000 WBC/mm³) or leukocytosis (>15,000 WBC/mm³)
- New onset of purulent sputum, or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements
- New onset or worsening cough, or dyspnea, anemia, or tachypnea
- Rales or bronchial breath sounds
- Worsening gas exchange (e.g., O₂ desaturations, increased oxygen requirements, or increased ventilator demand)
PNU2 – Pneumonia with specific laboratory findings

X-Ray findings (exactly the same as PNU1)

Patient with underlying disease has 1 or more solitary x-rays with one of the following:

- Necrosis and persistent infiltrate
- Consolidation
- Cavitary
- Pneumatoceles, in c/v y.o.

or

Patient with without underlying disease has 1 or more solitary x-rays with one of the following:

- Necrosis and persistent infiltrate
- Consolidation
- Cavitary
- Pneumatoceles, in c/v y.o.

PNU2 – Pneumonia with specific laboratory findings

Signs and Symptoms

At least one of the following:

- Fever (>38°C/100.4°F) with no other cause
- Leukopenia (<4,000 WBC/mm³) or leukocytosis (>12,000 WBC/mm³)
- Altered mental status with no other cause, in ≥70 y.o.
**PNU2 – Pneumonia with specific laboratory findings**

**Signs and Symptoms**

At least one of the following:
- New onset of purulent sputum or change in character of sputum or respiratory secretions, or increased suctioning requirements
- New onset or worsening cough, or dyspnea or tachypnea
- Rales or bronchial breath sounds
- Worsening gas exchange

**Rales may be described as “crackles”**

**PNU2 – Pneumonia with specific laboratory findings**

**Laboratory Criteria**

Bacterial or Filamentous Fungal Pathogens

At least one of the following:
- Positive growth in blood culture not related to another source of infection
- Positive growth in culture of pleural fluid
- Positive quantitative culture from respiratory tract sample (i.e., BAL or protected specimen brushing)
- 10% BAL obtained cells contain intracellular bacteria on direct microscopic exam (e.g., Gram stain)
- In an immunocompetent patient, blood cultures positive for coag neg staph, common skin contaminants, and yeasts are not the agent of pneumonia
- Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae

**Pneumonia 2**

**Specific laboratory findings**

March 11-12, 2009
**PNU2 – Pneumonia with specific laboratory findings**

**Laboratory Criteria**

At least one of the following:

- Positive culture of virus or Chlamydia from respiratory secretions
- Positive detection of viral antigen or antibody from respiratory secretions (e.g., ELISA, FAMA, small viral assay, PCR)
- Fourfold rise in paired sera (IgG) for pathogen (e.g., influenza viruses, Chlamydia)
- Positive PCR for Chlamydia or Mycoplasma
- Positive micro-ELISA for Chlamydia

**Viral, Legionella, and other Bacterial Pneumonias**

- Positive culture or visualization by micro-ELISA or Legionella spp. from respiratory secretions or tissue
- Detection of Legionella pneumophila serogroup 1 antibodies in urine by RIA or ELISA
- Four-fold rise in serum pneumophila serogroup 1 antibody titer to ≥1:125 in paired acute and convalescent sera by indirect ELISA.

---

**PNU2 Viral and fungal pathogens**

---

**PNU3 – Pneumonia in Immunocompromised Patient**

**X-Ray findings** (exactly the same as PNU1 and PNU2)

- Patient with underlying disease
  - Or
  - New or progressive and persistent infiltrate
  - Consolidation
  - Cavitary
  - Pneumatocele, m-1 y.o.

- Patient without underlying disease
  - Or
  - New or progressive and persistent infiltrate
  - Consolidation
  - Cavitary
  - Pneumatocele, m-1 y.o.
**PNU3 – Pneumonia in Immunocompromised Patient**

**Signs and Symptoms**

- Fever of ≥98°F or ≤100.4°F with no other recognized cause
- For adults 275 years old, altered mental status with no other recognized cause
- New onset of patient's cough or change in character of sputum or increased respiratory symptoms or increased suctioning requirements
- New onset or worsening cough, dyspnea, or hemoptysis
- Rales or bronchial breath sounds
- Increased respiratory rate
- Hypoxemia
- Fever and chills

**Laboratory Criteria**

At least one of the following:

- Matching positive blood and sputum cultures with CVC
- Evidence of fungi or Pneumocystis carinii from minimally contaminated ULA specimen (e.g., BAL or protected specimen brushing) from one of the following:
  - Direct microscopic exam
  - Acid-fast stain
  - Direct fluorescent stain
  - Acid-fast fluorochrome

Blood and sputum specimens must be collected within 48 hours of each other.

Sputum obtained by deep cough, induction, aspiration, or lavage are acceptable.
Definition: Immunocompromised Patient

- Patients with:
  - Neutropenia – absolute neutrophil count <500/mm$^3$
  - Leukemia
  - Lymphoma
  - HIV with CD4 count <200
  - Splenectomy

- Patients who are:
  - Early post-transplant
  - On cytotoxic chemotherapy
  - On high dose steroids
    - >40 mg prednisone or its equivalent daily for >2 weeks

Definition: Tachypnea

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Tachypnea Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>&gt;=25 breaths per minute (bpm)</td>
</tr>
<tr>
<td>Premature Infants (&lt;37 – 40 wks gestation)</td>
<td>&gt;=75 bpm</td>
</tr>
<tr>
<td>Infants &lt;2 months old</td>
<td>&gt;=60 bpm</td>
</tr>
<tr>
<td>Infants 2-12 months old</td>
<td>&gt;=50 bpm</td>
</tr>
<tr>
<td>Children &gt;1 year old</td>
<td>&gt;=30 bpm</td>
</tr>
</tbody>
</table>

Comments: Sputum

Purulent sputum is defined as secretions from lungs, bronchi, or trachea that contain ≥25 neutrophils and ≤10 squamous epithelial cells.

Change in character of sputum refers to the color, consistency, odor, and quantity.

A single notation of purulent sputum or change in character of sputum, is not meaningful.
Other Considerations

Physician diagnosis of pneumonia alone is not an acceptable criterion for pneumonia

Although specific pneumonia criteria are identified for infants and children, any of the pneumonia criteria can be used for pediatric patients.

Important Note!

Aspiration pneumonia is considered healthcare-associated if the aspiration occurred during intubation and the criteria for pneumonia are met.

Specimen Collection in Pneumonia

An endotracheal aspirate is not a minimally contaminated specimen. An endotracheal aspirate does not meet the laboratory criteria.

<table>
<thead>
<tr>
<th>Specimen collection/technique</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung parenchyma</td>
<td>$\geq 10^4$ cfu/ml</td>
</tr>
<tr>
<td>Bronchoscopically (B) obtained specimens</td>
<td></td>
</tr>
<tr>
<td>Bronchoalveolar lavage (B-BAL)</td>
<td>$\geq 10^3$ cfu/ml</td>
</tr>
<tr>
<td>Protected BAL (B-PBAL)</td>
<td>$\geq 10^3$ cfu/ml</td>
</tr>
<tr>
<td>Protected specimen brushing (B-PSB)</td>
<td>$\geq 10^2$ cfu/ml</td>
</tr>
<tr>
<td>Nonbronchoscopically (NB) obtained (blind) specimens</td>
<td></td>
</tr>
<tr>
<td>NB-BAL</td>
<td>$\geq 10^4$ cfu/ml</td>
</tr>
<tr>
<td>NB-PSB</td>
<td>$\geq 10^4$ cfu/ml</td>
</tr>
</tbody>
</table>
QUESTIONS?
Terms and Definitions

- The data you report must use exactly the same terms and definitions
  - NHSN Inpatient
  - NHSN Outpatient
  - NHSN Operative Procedure
  - Operating Room

Additional terms will be added as we specifically discuss SSI
**Definition: NHSN Inpatient**

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

**Definition: NHSN Outpatient**

A patient whose date of admission to the healthcare facility and the date of discharge are the same day.

**Definition: 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
3. is represented by an NHSN Operative Procedure Code
Definition: Operating Room

- A patient care area that meets the Facilities Guidelines Institute criteria for an operating room*
- May include:
  - Traditional operating room
  - C-section room
  - Interventional radiology room
  - Cardiac cath lab

*Guidelines for design and construction of health care facilities. Formerly the American Institute of Architects.

NHSN Operative Procedure (cont.)

- If the skin incision edges do not meet because of wires or devices or other objects extruding through the incision, the incision is not considered primarily closed and therefore the procedure is not considered an operation.
- Any subsequent infection is not considered a procedure-associated infection (e.g., SSI).

NHSN Operative Procedure Codes

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

<table>
<thead>
<tr>
<th>Category</th>
<th>ICD-9-CM Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHOL</td>
<td>51.03, 51.04, 51.13, 51.21-51.24, 47400, 47562, 47563, 47564, 47600, 47605, 47610, 47612, 47622</td>
</tr>
<tr>
<td>COLO</td>
<td>17.31-17.36, 17.39, 45.00, 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, 46.93</td>
</tr>
<tr>
<td>CLEAN</td>
<td>01.31, 01.34, 01.36-01.38, 01.20, 01.31, 01.32, 01.34, 01.41</td>
</tr>
</tbody>
</table>

CPT Codes

- 44145, 44146, 44147, 44150, 44151, 44160, 44204, 44205, 44206, 44207, 44208, 44210
When an NHSN Operative Procedure is selected for monitoring, all the procedures within that category must be followed.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPRO 2124-4</td>
<td>Knee prosthesis Arthroplasty of knee 00.85-09.84, 82.54, 82.55</td>
</tr>
<tr>
<td>KTP 2123-8</td>
<td>Kidney transplant Transplantation of kidney 55.01, 55.69</td>
</tr>
</tbody>
</table>

**Important Note**

- Some operative procedures have more than one incision
  - Example: CBGB in which an incision to harvest a donor vessel is made that is separate from the primary incision
- Record these procedures only one time – there is no separate procedure code for the donor harvest site.

**CBGC** – Coronary artery bypass graft with only a chest incision (mammary donor site)

**CBGB** – Coronary artery bypass graft with two incisions – chest incision and donor site (usually leg)

These procedures are mutually exclusive for a single trip to the OR. A patient can never have both!
Monthly Reporting Plan – Procedures

First, decide which procedures to monitor.

If you monitor SSI, choose whether to monitor inpatients, outpatients, or both.

If you monitor PPP, you can only select inpatient procedures.

Denominator Data

1. The reporting period is one month.
2. Collect a procedure record for every procedure that was done during that month if it is in your Monthly Reporting plan.

Denominator for Procedure

For example, if your Monthly Reporting Plan indicates that you’ll monitor HYST procedures in July, and 43 HYST operations are done in July, then you should enter 43 separate procedure records into NHSN.
The NHSN Procedure Code and Date of Procedure must be entered.
The ICD-9-CM code is optional.

### Procedure Details – Outpatient and Duration

Duration (cut time): Required. Record the hours and minutes between the skin incision and skin closure. 
Do not record anesthesia time!

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

### Additional Rules about Duration

- If more than one NHSN operative procedure is done through the same incision during the same trip to the OR, create a record for each procedure and use the total time for the duration of both.

Example: Mr. Jones had a colon resection (COLO) and also an appendectomy (APPY). The time from the first incision until skin closure was 2 hours. A Denominator for Procedure record was completed for the COLO and another for the APPY. The duration for each was recorded as 2 hours and 0 minutes.
Additional Rules about Duration

• If the patient goes to the OR more than once during the same admission and another procedure is performed through the same incision within 24 hours of the original incision, report only one procedure, combining the durations for both operations.

Example: Fred Smith had CBGC surgery performed on Tuesday morning which had a duration of 4 hours and 10 minutes. On Tuesday evening, he was returned to the OR where exploratory surgery was done through the same incision to repair a bleeding vessel. The surgical cut time was 2 hours and 10 minutes.

The duration for the CBGC procedure is reported as 6 hours and 20 minutes.

Additional Rules about Duration – Bilateral Procedures

• For bilateral operative procedures, two separate Denominator for Procedure forms/screens 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.

Denominator for Procedure – Wound Class

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

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

Clean-Contaminated
- 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

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

Dirty
- Old traumatic wounds with retained devitalized tissue
- Wounds involving existing clinical infection or perforated viscera

Wound Class Cases

<table>
<thead>
<tr>
<th>Case</th>
<th>Wound Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susanne undergoes an appendectomy following 2 days of acute abdominal pain with rebound tenderness. At the end of the case, the surgeon indicates that the appendix had ruptured and the surgical area was irrigated and Keflex was ordered for 3 days postoperatively.</td>
<td>3</td>
</tr>
<tr>
<td>Fred has a KPRO procedure. The operation was completed successfully with no breaks in operative asepsis.</td>
<td>1</td>
</tr>
<tr>
<td>George has a KPRO revision. When the surgeon makes the incision into the surgical site, she notes that the knee joint demonstrates purulent matter and inflammation. A specimen is obtained and sent to the laboratory which grows S. aureus (MSSA).</td>
<td>4</td>
</tr>
</tbody>
</table>
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.

ASA Class: 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 Class
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.
Denominator for Procedure - Emergency

Emergency: An operative procedure on a patient whose condition did not allow time for the standard preoperative preparations normally done prior to a scheduled operation (e.g., stable vital signs, adequate antiseptic skin preparation, colon decontamination in advance of colon surgery, etc.).

Denominator for Procedure - Trauma

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

Denominator for Procedure – Surgeon Code

Surgeon Code: Enter the code of the surgeon who performed the principal operative procedure.

If more than one surgeon performed the surgery, enter the code for the surgeon who was primarily responsible for the case.
Denominator for Procedure - Endoscope

Endoscope: Required
If the entire NHSN operative procedure was performed using a laparoscope, select Yes

Exception: For CBGB operations, if the donor vessel was harvested using the laparoscope, select Yes

Use of Laparoscope in Hysterectomy

- Classification based on route of uterine removal is rescinded!
- The focus should be on the surgical technique or approach used for the detachment of the uterine structures.
- Code assignment should not be based on the location where the structures were physically removed from the patient's body

Implant:
A nonhuman-derived object, material, or tissue that is permanently placed in a patient during an operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes. Examples include: porcine or synthetic heart valves, mechanical heart, metal rods, mesh, sternal wires, screws, cements, internal staples, hemoclips and other devices. Non-absorbable sutures are excluded because IPs may not easily identify or differentiate the soluble nature of the suture material.
Denominator for Procedure

**TRANSPLANT**

Transplant: Human cells, tissues, organs, or cellular- or tissue-based products that are placed into a human recipient via grafting, infusion, or transfer. Examples: organs, ligaments, bone, skin, corneas.

- **Autologous** or "autograft" transplants are products that originate from the patient’s own body.
- **Non-autologous** or "allograft" transplants are products derived from another human body, either a cadaver or a live donor.

Non-autologous Transplant: As of 2012, this field is not used!

---

Importing Procedures

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

**NHSN Resources**

- Document Library
- Newsletters
- **NHSN Report 2000**
- AUC, MCF (available in 12 pages)
- Training
- Contact

---

Importing Patient Safety Procedure Data

The NHSN will allow importation of procedure data as an AUC/E Controlled Procedure Datafile. You can generate the required data from different clinical 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 line which is highlighted. Reporting Time and the Field specifies the processor order for the report file record. If you need to import records for procedures not on this file, you must specify which procedures to include.

Custom procedures can also be imported if they are not listed on the custom options page.

- If a selected procedure is performed, two procedure records are required. Refer to the NHSN Procedure Code list below for a list of procedures that can be selected.
- Important: The code enters the data into the field, not the database. The code enters the data into the database, not the database.

http://www.cdc.gov/ncidod/dhqp/pdf/nhsn/ImportingProcedureDatav1.3.5.8.pdf
Every field that is required on the Denominator for Procedure form is translated to the import document.

Sample Import File

http://www.cdc.gov/nhsn/XLS/SampleImport_withHeader_6.6.cs

Note: Header row (yellow) must be deleted before the file can be imported.
When this message appears, all your procedures have been imported.
Denominator for Procedure - Summary

- Complete a Denominator for Procedure form for every procedure that is selected for surveillance.
- Alternatively, procedure records can be imported

QUESTIONS?

SURGICAL SITE INFECTION - SSI
Introduction

• Estimated 20% of all HAIs are SSIs
• Each SSI is associated with approximately 7-10 additional postoperative hospital days
• Attributable cost estimates of SSI range from $3,000 - $29,000 each

Case Finding - SSI Surveillance

• Review of patient and laboratory records during the patient admission
• Review of surgical patient readmissions
• Microbiology data from postoperative wound cultures

SSI Post-discharge Surveillance

Post-discharge surveillance methods may also include:

• Examination of patient surgical site during follow-up visits to physician office or surgery clinic
• Surgeon surveys by mail or phone
• Review of medical records for postoperative visits
SSI forms

SSI Definitions

Superficial Incisional
• SIP
• SIS

Deep Incisional
• DIP
• DIS

Organ/Space
• BONE
• BRST
• CARD
• DISC
• EAR
• EMET
• ENDO
• etc.

Superficial Incisional SSI

A superficial incisional SSI (SIP or SIS) must meet the following criterion:
Infection occurs within 30 days after the operative procedure and involves only skin and subcutaneous tissue of the incision and patient has at least one of the following:
- purulent drainage from the superficial wound
- organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision
- at least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat, and superficial incision is deliberately opened by surgeon, and is culture-positive or not cultured. A culture-negative finding does not meet this criterion.
- diagnosis of superficial incisional SSI by the surgeon or attending physician.

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 (e.g., KPRO incision or 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 (e.g., donor site [leg] incision for coronary artery bypass graft with a donor site [CBGB])

SSI Definitions

[Image of SSI definitions with diagrams of skin, subcutaneous tissue, deep soft tissue, and organ spaces with SSI types indicated]
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/tenderness. A culture-negative finding does not meet this criterion.
c. an abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination
d. diagnosis of a deep incisional SSI by a surgeon or attending physician.

DIP and DIS

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 (e.g., C-section incision or 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 (e.g., donor site [leg] incision for coronary artery bypass graft with a donor site [CBGB])

Example

Charles has purulent drainage from the muscle tissue of the anterior incision following a spinal fusion (FUSN) in which both anterior and posterior incisions were made. He also has redness and induration around the posterior wound. The doctor opens and drains the skin incision on his back. No culture is done for either site.

How should this be reported to NHSN?

A. DIP
B. SIS
C. Both
D. Neither
Organ/Space SSI

SSI Definitions


Organ/Space SSI

Specific event types that must be used to differentiate organ/space SSI

DOME: Osteomyelitis
BREST: Breast abscess/mastitis
CARD: Myocarditis/pericarditis
DSC: Sinus space
EAB: Ear, mastoid
EMET: Endometritis
DENOD: Epididymitis
ORS: Other than sinuses
OREP: Other respiratory
UR: Gastrointestinal
IM: Intraabdominal, NOS
IC: Intracranial
VCUF: Vaginal cuff
When a patient with an SSI has had more than one operation...

If a patient has several NHSN operations prior to an SSI, report the operation that was performed most closely in time to the infection date.

Example: Mr. Smith underwent a knee replacement procedure (KPRO) on 2/12/10. Three days later, he went back to surgery to drain a hematoma (OTH). He developed a joint space abscess on 4/18/10. This SSI is attributed to the second procedure (OTH), not the KPRO.

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 a vegetative valve, then the SSI will be linked to the CARD.

Then, if it's not clear or if the infection site being reported is not an SSI, use the NHSN Principle Operative Procedure Selection List to select which operative procedure to report.

Table 3. NHSN Principal Operative Procedure Selection Lists

<table>
<thead>
<tr>
<th>Priority</th>
<th>Code</th>
<th>Abdominal Operations</th>
<th>Thoracic Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SB</td>
<td>Small bowel surgery</td>
<td>Heart transplant</td>
</tr>
<tr>
<td>2</td>
<td>KIT</td>
<td>Kidney transplant</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LIT</td>
<td>Liver transplant</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>BIL1</td>
<td>Bilat, right or pancreatic surgery</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CD</td>
<td>Reconstructive surgery</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>COLO</td>
<td>Colon surgery</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>CARD</td>
<td>Cardiac surgery</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>CBGC</td>
<td>Coronary artery bypass graft with valve insertion</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority</th>
<th>Code</th>
<th>Neurosurgical/OR Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RHUS</td>
<td>Rhizotomy, naff, etc.</td>
</tr>
<tr>
<td>2</td>
<td>FUS</td>
<td>Fusion</td>
</tr>
<tr>
<td>3</td>
<td>SPIN</td>
<td>Spinal fusion</td>
</tr>
<tr>
<td>4</td>
<td>TAI</td>
<td>Transverse increased acetabulum surgery</td>
</tr>
</tbody>
</table>
Reporting SSIs

The Surgical Site Infection (SSI) form is completed for each patient found to have an SSI using the definitions.

SSI Form -- Basic SSI Information

Event: SSI

Date of Event: The date the signs or symptoms appeared or the date the diagnosing specimen was collected.

Insert the NHSN Operative Procedure Code (p. 9-2)

Insert the corresponding ICD-9 code (optional)
SSI – Basic SSI Information

Enter the date of the operation.

If this patient was admitted and discharged in the same calendar day, select Yes.

SSI Form -- Basic SSI Information

Enter “Yes”, if the pathogen is being followed for Infection Surveillance in the MDRO/CDI Module in that location as part of your Monthly Reporting Plan.

If the pathogen for this infection happens to be an MDRO but your facility is not following the Infection Surveillance in the MDRO/CDI Module in your Monthly Reporting Plan, answer “No” to this question.

SSI Form – Basic SSI Information

Enter the date the patient was admitted to the hospital when the operation was performed and the location where the patient was housed after leaving the OR/PACU.

Note: Location is an optional field!
Specific Event: Check the box which indicates the definition that was used to identify the SSI.

If the specific event is Organ/Space, specify the organ/space site that was identified.

Select the specific elements of the definition that were used to identify this infection.
**SSI – Event Details**

Detected: Check the box to indicate when/how the SSI was identified

- A: During admission when surgery was performed
- P: Post-discharge surveillance
- RF: Readmission to facility where procedure was performed
- RO: Readmission to a different facility

---

**Secondary BSI**

- If the patient had a culture-confirmed bloodstream infection with a documented SSI, circle **Yes**.

---

**Secondary BSI**

- A culture-confirmed BSI associated with a documented HAI at another site
- Not cultured primary site
- Cultured primary site

If the primary infection is cultured, the Secondary BSI must yield culture of the same organism and exhibit the same antibiogram as the primary HAI site.

If a culture is not used to meet the criteria for a primary HAI, and the blood culture grows an appropriate organism, the BSI is secondary and the organism grown is reported for the primary HAI.
All data are linked together.

**SSI OUTPUT**

**NHSN Basic Risk Index**

The patient’s SSI risk category is simply the number of these factors present at the time of the operation:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation &gt; duration cut</td>
<td>1</td>
</tr>
<tr>
<td>Wound class III or IV</td>
<td>1</td>
</tr>
<tr>
<td>ASA score ≥ 3</td>
<td>1</td>
</tr>
</tbody>
</table>
SSI Rate

SSI Rate = \frac{\text{# SSI in patients during specified time}}{\text{# operations during specified time}} \times 100

SSI Rates have been moved to the “Advanced” section of the output options. Note that, while these options are available, you will only be able to obtain your facility’s SSI rates. Comparison to the previously-published NHSN pooled means will no longer be available.

2008 NHSH Report – SSI Rates

Standardized Infection Ratio (SIR)

- The new SSI SIRs use risk adjustment calculated through logistic regression modeling.
- Allows for all available risk factors to be considered.
- Each risk factor’s “weight” will vary according to its significant contribution to the risk for that SSI.
- For all NHSN procedures, the models predicted SSI risk better than the basic risk index.
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>VISHN</td>
<td>Age, medical school affiliation*, number of beds*, wound class</td>
</tr>
</tbody>
</table>

Calculation of “Expected Cases” based on all Risk Factors

Logistic Regression Model

<table>
<thead>
<tr>
<th>Factor</th>
<th>Parameter Estimate</th>
<th>OR</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.644</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (â¥44 vs â44)</td>
<td>0.520</td>
<td>1.659</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ASA (3/4/5 vs 2)</td>
<td>0.425</td>
<td>1.526</td>
<td>0.013</td>
</tr>
<tr>
<td>Duration (&gt;200 vs ≤200)</td>
<td>0.501</td>
<td>1.656</td>
<td>0.013</td>
</tr>
<tr>
<td>Medical school affiliation (Y vs N)</td>
<td>1.069</td>
<td>3.922</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

The model represented in the table is for teaching purposes only and should not be considered an actual model from which to calculate a patient’s risk of SSIs.

The parameter estimates above can be plugged into the following formula:

\[
\log \left( \frac{p}{1-p} \right) = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5
\]

\[
= -5.488 + 0.520 (Age \leq 44) + 0.425 (ASA 3/4/5) - 0.501 (Duration >100) + 1.069 (Med school affiliation*)
\]

*for these risk factors, if present = 1; if not = 0.
Example: Overall SSI SIR

<table>
<thead>
<tr>
<th>Procedure</th>
<th>NHSN</th>
<th>All SSI Model</th>
<th>All SSI Model</th>
<th>All SSI Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>524</td>
<td>13</td>
<td>13.097</td>
<td>1.94</td>
</tr>
<tr>
<td>CountEd</td>
<td>524</td>
<td>13</td>
<td>13.097</td>
<td>1.94</td>
</tr>
</tbody>
</table>

- 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 our 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.

Questions?

C. difficile Lab ID Reporting in NHSN
Goal of CDAD (CDI) Module

- Monitoring *C. difficile* infection (CDI) will help to evaluate local trends and changes in the occurrence of these pathogens and related infections.
- Provide a mechanism for facilities to report and analyze CDI data.

Note: The term CDI is replacing CDAD. Both terms represent the same illness and are used interchangeably.

Introduction

- *C. difficile* infections are linked to 14,000 deaths in the US each year.
- Deaths related to *C. difficile* increased 400% between 2000 and 2007, due in part to a stronger germ strain.
- Most *C. difficile* infections are connected with receiving medical care.
- Almost half of infections occur in people younger than 65, but more than 90% of deaths occur in people 65 and older.

Introduction

- About 25% of *C. difficile* infections first show symptoms in hospital patients; 75% first show in nursing home patients or in people recently cared for in doctors’ offices and clinics.
- *C. difficile* infections can be prevented. Early results from hospital prevention projects show 20% fewer *C. difficile* infections in less than 2 years with infection prevention and control measures.
If you choose to monitor *C. difficile*, you must select at least one of these two reporting options!

- Adherence to Hand Hygiene
- Adherence to gown/glove use

An HAI is a localized/systemic condition resulting from an adverse reaction to the presence of an infectious agent or its toxin.

There must be no evidence that the infection was present or incubating at the time of the hospital admission.

*C. difficile* infections must meet NHSN-defined criteria for gastroenteritis or gastrointestinal tract infection.
CDI LabID Event Reporting

Allows laboratory testing data to be used without clinical evaluation of the patient, allowing for a much less labor intensive method to track C. difficile.

Definitions

- Laboratory-Identified (LabID) Event: Any non-duplicate CDI-positive lab assay.
- CDI-positive Lab Assay: Positive lab assay for C. difficile toxin A and/or B, or toxin-producing organism detected from stool culture or other lab means.
- Duplicate C. difficile-positive test: CDI-positive assay from same patient within 2 weeks of previous positive assay.

C. difficile LabID Event

+ C. difficile test

- Proc + test ≤2 wks

- Not a C. difficile test

- Duplicate C. difficile test

- C. difficile LabID Event
**Required Minimum Reporting**

- All non-duplicate CDI-positive lab assays per patient per month
- At least three consecutive months in a calendar year

C. difficile testing performed routinely in lab, only on unformed (conforming to the shape of the container) stool samples

**Reporting Method**

For CDI LabID Event reporting, use either:
- **A** – Facility-wide by location
- **B** – Selected locations in the facility
- **C** – Facility-wide

Settings:
1) Inpatient locations
2) Outpatient locations – where care provided to patients post-discharge
   - OR prior to admission
   - No Newborn locations
   - No outpatient dialysis centers

---

**Diagram with Flowchart:**

- Test on unformed stool sample
- Position for C. difficile
- Prior C. difficile positive in ≤ 2 weeks
- Duplicate Test
- Yes
- Not a LabID Event
- No
- Not a LabID Event
Forms for LabID Data Collection

Reporting Location Options – LabID Events
You can collect C. difficile Lab ID Event data:

A Facility-wide by location:
Report every location in the facility separately
• Patient days
• Admissions
• CDAD data

B Selected locations
You choose the specific locations in your facility
• Patient days
• Admissions
• CDAD data

C Overall / Facility-wide
Report all locations together
• Patient days
• Admissions
• CDAD data

Reporting Infections:
Facility-wide by location
Report separately from every location in the facility
Reporting Infections: Selected Locations Only

Report separately for one or more specific locations of a facility.
Reporting Infections: Facility-wide

Report data for entire facility together.

If you would like to monitor a specific location in addition to the entire facility, you may do so.
Select "yes" if the LabID Event is being reported from an outpatient location where there are no admissions (e.g., emergency department, wound care, etc.). If the patient was an outpatient, Date Admitted to Facility and Date Admitted to Location are not required.
CDI LabID Event Form

If the LabID Event was reported from an outpatient location, leave this blank.

Enter the patient care area where the patient was assigned when the LabID specimen was collected.

Note: the "Transfer Rule" does not apply to LabID Events.

Note: Because of existing business rules for edit checks in NHSN, the date of specimen collection must be the same date or later than the admission date.

Circle "Yes" if the patient has been an inpatient and discharged from your facility in the past 3 months.
CDI LabID Event Form

If the patient was discharged from your facility in the past 3 months, enter the most recent date of discharge.

CDI LabID Data Entry Screen

Non-editable field. Will be auto-filled by the system only, depending on whether there is prior LabID Event entered for the same organism and same patient. If there is a previous LabID Event for this organism entered in NHSN in a prior month, the system will auto-populate with "Yes.

Denominator Data (LabID)

If you are using Method A or B, complete a Denominator Record for each location...
If this is a single inpatient location, enter the total number of patient days for the month.

If this is a single inpatient location, enter the total number of admissions for this location for the month.

This number would be the total number of patient days for the entire facility for the month minus any patient days for NICU or Well Baby Nurseries.

This number would be the total number of admissions for the entire facility for the month minus any admissions to NICUs or Well Baby Nurseries.

Check C. difficile as the organism that will be monitored in this location.
If C. difficile Events are being monitored at the FacWideOUT level, then Total Encounters minus any encounters for Well Baby Clinics must be entered here.
CDI Metrics

Note! The following categories and prevalence and incidence calculations are built into the analysis capabilities of NHSN.

Incidence vs. Prevalence

- **Incidence Rate**: measures the occurrences of new cases or events in a specific population during a given time period
- **Prevalence Rate**: measures the occurrence of existing (old and new) cases in a specific population during a given time period

Categories of CDI LabID Events

- **Community Onset (CO)**: LabID Event collected as an outpatient or an inpatient ≤3 days after admission to the facility (i.e., days 1, 2, or 3)
- **Community-Onset Healthcare Facility-Associated (CO-HCFA)**: CO LabID Event collected from a patient who was discharged from the facility ≤ 4 weeks prior to current date of stool specimen collection
- **Healthcare Facility-Onset (HO)**: LabID Event collected >3 days after admission to the facility (i.e., on or after day 4)
CDI Prevalence Rates

Admission Prevalence Rate

By facility

# non-duplicate CDI LabID Events per patient per month identified ≤ 3 days after admission to the facility

# patient admissions to the facility

X 100

By single location

# non-duplicate CDI LabID Events per patient per month identified ≤ 3 days after admission to the specific location

# patient admissions to the same location

X 100

Location Percent Admission Prevalence that is CO

# Admission Prevalent LabID Events to a location that are CO

Total # Admission Prevalent LabID Events

X 100

Note: the numerator in this formula does not include Admission Prevalent LabID Events that are CO-HFCA

Location Percent Admission Prevalence that is CO-HFCA

# Admission Prevalent LabID Events to a location that are CO-HFCA

Total # Admission Prevalent LabID Events

X 100
Location Percent Admission Prevalence that is HO

\[
\frac{\text{# Admission Prevalent LabID Events to a location that are HO}}{\text{Total # Admission Prevalent LabID Events}} \times 100
\]

Overall Patient Prevalence Rate

Number of 1st CDI LabID Events per patient per month for the location*, regardless of time spent in that location*

\[
\frac{\text{Number of patient admissions to the location}^*}{\text{* or facility}}
\]

Outpatient Reporting

By specific location:

\[
\frac{\text{# all non-duplicate CDI LabID Events per patient for the location}}{\text{# of patient encounters for the location}} \times 100
\]

Facility-wide (FacWideOUT)

\[
\frac{\text{# all non-duplicate CDI LabID Events per patient for the facility}}{\text{# of patient encounters for the location}} \times 100
\]
CDI Incidence Rates

Location CDI Incidence Rate

# of Incident CDI LabID Events per month identified >3 days after admission to the location
# of patient days for the location
X 10,000

Facility CDI Healthcare Facility-Onset Incidence Rate

# of all Incident HO CDI LabID Events per month in the facility
# of patient days for the facility
X 10,000

Note: this calculation is only accurate for Overall Facility-Wide Inpatient reporting

Facility CDI Combined Incidence Rate

# of all Incident HO and CO-HCFA CDI LabID Events per month in the facility
Number of patient days for the facility
X 10,000

Note: this calculation is only accurate for Overall Facility-Wide Inpatient reporting
Question

- I don’t have a strong statistics background and I’m not sure I have time to separate out the Healthcare Onset (HO) from the Community Onset (CO) MDROs. What should I do?

No problem. The NHSN analysis tool automatically calculates the rates based on the information you provide using the reporting plan, event, and denominator information.

If you choose to monitor C. difficile, you must select at least one of these two reporting options!
Why do you want the data?

- **Performance Improvement**
  - Line list
  - Don't use a rate table for daily for weekly analysis
- **Planning – long and short term**
  - Frequency distribution
  - Rate table
- **Formal reports**
  - Rate tables
  - SIR tables

Generate Dataset

The screen will show the date and time the most recent dataset was generated. If you have data that was added to NHSN since that date/time, it will not be included in your output unless you generate a new dataset.

Generate Data Sets

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.
Tree View Menu

If “Run” is selected, you will see an HTML screen with all dates and locations displayed.

If “Modify” is selected, you will be able to choose the format, dates, and other criteria to display.

Common Screen Elements
Check the Use Variable Labels box – this will create column and row names that are in English instead of code.

- **HTML** – (hypertext markup language) The document will appear very much like a web page. While the output will have a more professional appearance, it cannot be edited.
- **PDF** – (portable document format) Output will look like a document, but cannot be changed once it's generated.
- **CSV** – (comma separated value) the output will appear more like a spreadsheet with each value in a cell. It can be manipulated to change fonts, column width, etc. It can also be saved as a spreadsheet.
- **RTF** – (rich text format). Your final product will look like a table in Microsoft Word™. You can edit any or all of the text.

**HTML** - internet

<table>
<thead>
<tr>
<th>rowID</th>
<th>patID</th>
<th>dob</th>
<th>gender</th>
<th>admitDate</th>
<th>eventID</th>
<th>eventDate</th>
<th>eventType</th>
<th>spid</th>
<th>eventLocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>123</td>
<td>456</td>
<td>789</td>
<td>A</td>
<td>01/01/2010</td>
<td>123</td>
<td>01/01/2010</td>
<td>456</td>
<td>789</td>
<td>ABC</td>
</tr>
<tr>
<td>321</td>
<td>654</td>
<td>987</td>
<td>B</td>
<td>02/02/2010</td>
<td>234</td>
<td>02/02/2010</td>
<td>654</td>
<td>987</td>
<td>DEF</td>
</tr>
</tbody>
</table>

**PDF** – document

<table>
<thead>
<tr>
<th>rowID</th>
<th>patID</th>
<th>dob</th>
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<th>admitDate</th>
<th>eventID</th>
<th>eventDate</th>
<th>eventType</th>
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<td>02/02/2010</td>
<td>654</td>
<td>987</td>
<td>DEF</td>
</tr>
</tbody>
</table>

**RTF** – word processing

<table>
<thead>
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<th>eventDate</th>
<th>eventType</th>
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<td>02/02/2010</td>
<td>654</td>
<td>987</td>
<td>DEF</td>
</tr>
</tbody>
</table>

**CSV** – comma separated values

<table>
<thead>
<tr>
<th>rowID</th>
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<th>gender</th>
<th>admitDate</th>
<th>eventID</th>
<th>eventDate</th>
<th>eventType</th>
<th>spid</th>
<th>eventLocation</th>
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<td>234</td>
<td>02/02/2010</td>
<td>654</td>
<td>987</td>
<td>DEF</td>
</tr>
</tbody>
</table>
Specify a Time Period for Analysis

Select a time period or Leave Blank for Cumulative Time Period:

- **Date variable**: eventDate
- **Beginning**: 01/01/2010
- **Ending**: 12/31/2010

- **Year**: eventDateYr
- **2010**: 2010

- **Half-year**: eventDateYH
- **2009H1, 2009H2**: 2009H1, 2009H2

- **Quarter**: eventDateYQ
- **2010Q1, 2010Q2**: 2010Q1, 2010Q2

- **Month**: eventDateYM
- **01/2010, 12/2010**: 01/2010, 12/2010

*Uses calendar year

If time period is left blank, data for all dates in the system will be used.
Adding Selection Criteria

Choose a category of subset that you want to include from the drop-down list in the first box. Place your cursor in the box directly below and click. This gray box will appear.

If you choose the = sign, you will have one choice for this field (in this case, one location).
If you select **in** for the operator, you will have multiple drop-down fields to include.

In this example, we included three separate locations in our output.

**Selecting Specific Criteria for Analysis**

Double-check your filtering by clicking “Show Criteria”. This box will display the equation to filter your data.
Which fields to display
In what order they should be displayed
If you want certain items on separate pages
Generate a Line List

- Device-Associated Module
  - All Device-Associated Events
  - All Device-Associated Events
  - Frequency Table - All Device-Associated Events
  - Bar Chart - All Device-Associated Events
  - Line Chart - All Device-Associated Events
  - Note Table - All Device-Associated Data

- Other Options:
  - Run report
  - Save the output so you can run it again
  - Generate a Line List
  - Saves the modified dataset to another format
  - Sort by eventID, eventType
  - Data contained in this report were last generated on July 19, 2011 at 09:37 AM.
CLABSI Rate

CLABSI Rate = \( \frac{\text{# CLABSI s}}{\text{# central line days}} \times 1000 \)

- Stratify by:
  - Type of ICU or other location
  - Special Care Area (SCA)
  - Temporary line
  - Permanent line
  - Benign/other category
  - Line type (non-umbilical vs. umbilical)

CLABSI Rate Table for Central Line-Associated BS Data for ICU Other

<table>
<thead>
<tr>
<th>Location</th>
<th>CLAB</th>
<th>BS</th>
<th>BS BS</th>
<th>BS BS BS</th>
<th>BS BS BS BS</th>
<th>BS BS BS BS BS</th>
<th>BS BS BS BS BS BS</th>
<th>BS BS BS BS BS BS BS</th>
<th>BS BS BS BS BS BS BS BS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU</td>
<td>100</td>
<td>2</td>
<td>2.2</td>
<td>0.002</td>
<td>0.000001</td>
<td>0.0000000001</td>
<td>0.0000000000001</td>
<td>0.000000000000001</td>
<td>0.00000000000000001</td>
</tr>
</tbody>
</table>

Source of aggregate data: CDC Location IN-AUICE.CC:WS

Vital signs are monitored, and interventions are performed when necessary.
Standardized Infection Ratio (SIR)

- A summary measure used to track HAIs at a national, state, or local level over time
- Adjusts for patients of varying risk within each facility
- SIR compares the actual number of HAIs reported to the baseline U.S experience
- An SIR >1.0 indicates that more HAIs were observed than predicted

Calculation of SIR

<table>
<thead>
<tr>
<th>Type of ICU</th>
<th># CLABSI</th>
<th># CL Days</th>
<th>CLABSI Rate</th>
<th>NHSN Rate</th>
<th>Expected # CLABSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Cardiac</td>
<td>2</td>
<td>380</td>
<td>5.26</td>
<td>2.0</td>
<td>0.76</td>
</tr>
<tr>
<td>Medical</td>
<td>1</td>
<td>257</td>
<td>3.89</td>
<td>2.6</td>
<td>0.67</td>
</tr>
<tr>
<td>Med/Surg</td>
<td>3</td>
<td>627</td>
<td>4.78</td>
<td>1.5</td>
<td>0.94</td>
</tr>
<tr>
<td>Neuro-surgical</td>
<td>2</td>
<td>712</td>
<td>2.81</td>
<td>2.5</td>
<td>1.78</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>1976</td>
<td>4.05</td>
<td></td>
<td>4.15</td>
</tr>
</tbody>
</table>

\[
\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}} = \frac{8}{4.15} = 1.93
\]

Example – Overall CLABSI SIR

- During 2009, there were 9 CLABSI identified in our facility, and we observed 376 central line days from the locations from which the CLABSI were reported
- Based on the NHSN 2006-2009 baseline data, 7.191 CLABSI were expected
- This result is an SIR of 1.25 (9/7.191), signifying that during this time period, our facility identified 25% more CLABSI than expected
- The p-value and 95% Confidence Interval indicate that the number of observed CLABSI is not significantly higher than the number of expected CLABSI
Note: Only data are available at this time for VAP and SSI. They are not yet available for this measure.