The National Healthcare Safety Network (NHSN) Manual

PATIENT SAFETY COMPONENT PROTOCOL

Division of Healthcare Quality Promotion

National Center for Preparedness, Detection and Control of Infectious Diseases

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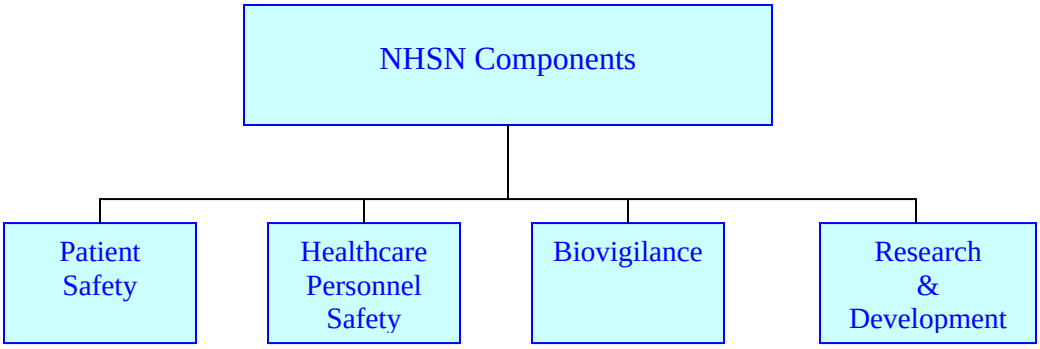
National Healthcare Safety Network (NHSN) Overview

The NHSN is a secure, internet-based surveillance system that integrates former CDC surveillance systems, including the National Nosocomial Infections Surveillance System (NNIS), National Surveillance System for Healthcare Workers (NaSH), and the Dialysis Surveillance Network (DSN).

NHSN enables healthcare facilities to collect and use data about healthcare-associated infections, adherence to clinical practices known to prevent healthcare-associated infections, the incidence or prevalence of multidrug-resistant organisms within their organizations, and other adverse events. Some U.S. states utilize NHSN as a means for healthcare facilities to submit data on healthcare-associated infections (HAIs) mandated through their specific state legislation.

The NHSN has three components, each concerned with various aspects of control and prevention of HAIs. Those four components are Patient Safety, Healthcare Personnel Safety, Biovigilance, and Research and Development as illustrated below in Figure 1.

Figure 1. Components of the NHSN system.



The Biovigilance Module is currently in pilot testing at 9 facilities and will be available to interested facilities pending post-pilot amendments.

Research and Development is concerned with enabling infection control software systems, private or public, to communicate with the NHSN thereby reducing manual data entry.. This component involves internal activities at CDC in partnership with software and data messaging specialists, and NHSN users are not involved with this component of the system.

NHSN users do however, access and participate in the Patient Safety and Healthcare Personnel Safety Components of NHSN. Within the Patient Safety Component, like-types of surveillance are grouped into modules, each concerned with healthcare

procedures, devices, or medications associated with HAIs. Specific types of surveillance within the Patient Safety Component are outlined below:

- Device-associated Module:
  - CLABSI - Central line-associated bloodstream infection
  - CLIP - Central line insertion practices adherence
  - VAP - Ventilator-associated pneumonia
  - CAUTI - Catheter-associated urinary tract infection
  - DE - Dialysis Event
- Procedure-associated Module:
  - SSI - Surgical site infection
  - PPP - Post-procedure pneumonia
- Medication-associated Module:
  - AUR - Antimicrobial use and resistance options
- Multidrug-Resistant Organisms/*Clostridium difficile*-associated Disease (MDRO/CDAD) Module
- High Risk Inpatient Influenza Vaccination Module

Instructions and standardized surveillance methods and definitions for each module are provided in individual protocols available on the NHSN website. Modules may be used singly or simultaneously and each module has its own minimum time-period for required participation (see individual modules). Regardless of the combination of modules a facility chooses to participate in, a total of 6 months of data must be reported annually to NHSN for continued participation.

There are two modules within the Healthcare Personnel Safety component of NHSN: Blood/Body Fluid Exposure Module and Healthcare Worker Influenza Vaccination Module.

Surveillance Techniques:

Some of the options in the following modules require active, patient-based, prospective surveillance of events and their corresponding denominator data by a trained Infection Preventionist (IP). This means that the IP shall seek out infections during a patient's stay by screening a variety of data sources, such as laboratory, pharmacy, admission/discharge/transfer, radiology/imaging, and pathology databases, and patient charts, including history and physical exam notes, nurses/physicians notes, temperature charts, etc. Others may be trained to screen data sources for these infections, but the IP must make the final determination. Laboratory-based surveillance should not be used alone, unless all possible criteria for identifying an infection are solely determined by laboratory evidence (e.g., LabID event detection in the MDRO & CDAD Module). Retrospective chart reviews should be used only when patients are discharged before all information can be gathered. NHSN forms should be used to collect all required data, using the NHSN definitions of each data field. To minimize the IP's data collection

burden, others may be trained to collect the denominator data and process of care data (e.g., central line insertion and high risk inpatient influenza vaccination information).

Procedure Associated Module:

Surgical site infection (SSI) and post-procedure pneumonia (PPP) monitoring is offered through protocols in this module. Both protocols require active, patient-based, prospective surveillance of infections and their corresponding denominator data by a trained IP. A variety of data sources, such as laboratory, pharmacy, admission/discharge/transfer information, radiology/imaging, and pathology databases, and patient charts, including history and physical notes, nurses/physicians notes, temperature charts, etc may be used. Others may be trained to screen data sources for these infections, but the IP must make the final determination as to whether the required criteria are met.

PPP events are monitored only for patients undergoing inpatient operative procedures and only during the patient's stay (i.e., post-discharge surveillance methods are not used for PPP). However both post-discharge and ante-discharge surveillance methods should be used to detect SSIs following in- and outpatient operative procedures. These methods include 1) direct examination of patients' wounds during follow-up visits to either surgery clinics or physicians' offices, 2) review of medical records or surgery clinic patient records, 3) surgeon surveys by mail or telephone, and 4) patient surveys by mail or telephone (though patients may have a difficult time assessing their infections). Any combination of these methods is acceptable for use; however, CDC criteria for SSI must be used. To minimize IPs' workload of collecting denominator data, operating room data may be downloaded (see file specifications at: http://www.cdc.gov/nhsn/pdf/ImportingProcedureDatav1.3.5.8.pdf).

See the SSI and PPP protocols for detailed instructions on NHSN related surveillance.

Device-Associated Module:

Medical instrumentation increases the risk of development of an HAI and most patients admitted for health care are exposed to some kind of medical device in the course of their treatment. Such devices include, but are not limited to, venous and urinary catheters, and ventilators. NHSN enables facilities to monitor infectious complications associated with the use of these devices and also to monitor processes related to their use which might increase infection risk. Specifically, surveillance of Central Line-associated Bloodstream Infection (CLABSI), Catheter-associated UTI (CAUTI), Dialysis Event (DE) and/or Ventilator-associated Pneumonia (VAP) is possible using the NHSN. In addition, Central Line Insertion Practices (CLIP) can be monitored to inform facilities of the appropriateness of their processes and how they may relate to HAI development.

Device-associated denominator data should be collected at the same time each day. 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.

See the respective device-associated protocols for detailed instructions on NHSN related surveillance.

Medication-Associated Module:

Multidrug-resistant organisms (MDROs) have made news headlines in the recent past. The use of antimicrobial agents has a direct effect on antimicrobial resistance patterns of pathogens. The observed increase in multidrug resistance is in part due to inappropriate prescription of, as well as incomplete completion of, courses of antibiotics.

The Medication-Associated Module allows facilities to collect information on the amount of antimicrobials that are utilized for patient care within their systems, as well as to collect data on the prevalence of drug-resistant organisms in their inpatient and outpatient programs. Microbiology and pharmacy methods of data collection are available options for this module.

See the Antimicrobial Use and Resistance (AUR) protocol for detailed instructions on NHSN related surveillance.

Multidrug-resistant Organism & *Clostridium difficile*-Associated Disease *(MDRO/CDAD)* Module:

The NHSN MDRO/CDAD Module offers a means for facilities to meet criteria and metrics that are outlined in several organizational guidelines to control and measure the spread of MDROs and CDAD within their healthcare system. The module has both required and optional surveillance activities that can be tailored to the needs of the facility. Infection surveillance and monitoring of proxy infection measures are choices available to facilities choosing to participate in this program within NHSN.

In addition, process measures related to adherence to contact precautions when caring for patients infected or colonized with an MDRO or *C. difficile,* and/or active surveillance testing for such organisms or, outcome measurements of incidence and prevalence of positive cultures of these organisms in patients can be undertaken.

See the MDRO/CDAD protocol for detailed instructions on NHSN related surveillance.

High Risk Inpatient Influenza Vaccination (HRIIV) Module:

Influenza continues to be associated with increased morbidity and mortality in certain patient populations including the very young, elderly, immunocompromised, and pregnant women. Hospitalization has been identified as a potential opportunity to provide influenza immunization to at-risk individuals.

The NHSN HRIIV module offers a means for facilities to track high-risk patient presentations to the healthcare system as well as data on the success of capitalizing on influenza vaccination opportunities. Various measurement options are available related to patient susceptibility and adherence to vaccination recommendations.

See the HRIIV Protocol for detailed instructions on NHSN related surveillance.

Identifying Healthcare-associated Infections (HAI) in NHSN

Any infection reported to NHSN must meet the definition of an NHSN healthcare-associated infection (HAI), that is, 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 care setting. Clinical evidence may be derived from direct observation of the infection site or review of information in the patient chart or other clinical records.

For certain, but not all, infection sites, a physician's or surgeon's diagnosis of infection derived from direct observation during a surgical operation, endoscopic examination, or other diagnostic studies or from clinical judgment may be an acceptable criterion for an NHSN infection, unless there is compelling evidence to the contrary.

NOTE: Physician's diagnosis of pneumonia alone is not an acceptable criterion for healthcare-associated pneumonia.

HAIs may be caused by infectious agents from endogenous or exogenous sources.

- Endogenous sources are body sites, such as the skin, nose, mouth, 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 healthcare environment.

The following special considerations are important when identifying HAIs:

- Infections occurring in infants that result from passage through the birth canal are considered HAIs.
- The following infections are not considered healthcare associated:
    - Infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection.
    - Infections in infants that have been acquired transplacentally (e.g., herpes simplex, toxoplasmosis, rubella, cytomegalovirus, or syphilis) and become evident ≤ 48 hours after birth.
    - Reactivation of a latent infection (e.g., herpes zoster [shingles], herpes simplex, syphilis, or tuberculosis).
- The following conditions are not infections:
    - Colonization, which means the presence of microorganisms on skin, on mucous membranes in open wounds, or in excretions or secretions but which are not causing adverse clinical signs or symptoms.
    - Inflammation that results from tissue response to injury or stimulation by noninfectious agents, such as chemicals.

Before an HAI is reported to NHSN, the person performing surveillance must decide that the clinical, laboratory, and other diagnostic information gathered concerning the patient satisfy the criteria for a particular type of HAI. To assist surveillance personnel in making these decisions consistently, each module in this manual contains a listing of specific infection sites used in the module and the criteria for determining the presence of an infection at each of those sites. The definitions used in this manual are the only criteria that should be used when identifying and reporting NHSN events. While all participants may not agree with all the criteria, it is important that NHSN participants consistently use them for reporting infections, so that rates between hospitals can be appropriately compared. The complete set of infection definitions, including all specific sites used for SSI organ/space infections can be found in Table 17[1].

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[1]Centers for Disease Control and Prevention. CDC/NHSN surveillance definition of health care-associate infection and criteria for specific types of infections in the acute care setting. Am J Infect Control 2008;36:309-32.

Patient Safety Monthly Reporting Plan

The *Patient Safety Monthly Reporting Plan Form* (CDC 57.106) is used by NHSN institutions to inform CDC which Patient Safety modules are used during a given month. This allows CDC to select the data that should be included into the aggregate data pool for analysis. Each participating institution is to enter a monthly Plan to indicate the module used, if any, and the events and locations and/or procedures they monitored.

There must be a Plan completed for every month that data are entered into NHSN although a facility may choose "No NHSN Patient Safety Modules Followed this Month" as an option. The *Instructions for Completion of Patient Safety Monthly Reporting Plan Form* (Tables of Instructions, Table 1) includes brief instructions for collection and entry of each data element on the form. A minimum of 6 months of data from at least one component is required during each calendar year to remain an active participant in NHSN.

Central Line-Associated Bloodstream Infection (CLABSI) Event

Introduction: An estimated 248,000 bloodstream infections occur in U.S. hospitals each year[1]. It is believed that a large proportion of these are associated with the presence of a central vascular catheter, though this is an area where more study is needed. For the purposes of NHSN, such infections are termed central line-associated bloodstream infections (CLABSI). Bloodstream infections are usually serious infections typically causing a prolongation of hospital stay and increased cost and risk of mortality.

CLABSI can be prevented through proper management of the central line. These techniques are addressed in the CDC's Healthcare Infection Control Practices Advisory Committee (CDC/HIPAC) *Guidelines for the Prevention of Intravascular Catheter-Related Infections*[2].

Settings: Surveillance will occur in any of four types of inpatient locations: (1) intensive care units (ICUs), (2) specialty care areas (SCAs) (includes hematology/oncology wards, bone marrow transplant units, solid organ transplant units, inpatient dialysis units, long term acute care areas, (3) neonatal intensive care units (NICUs), and (4) any other inpatient location in the institution where denominator data can be collected (e.g., surgical or medical wards).
NOTE: Surveillance for CLABSIs after the patient is discharged from the facility is not required, however, if discovered, these infections should be reported to NHSN. No additional central line days are reported.

Requirements: Surveillance for CLABSI in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions:
Primary bloodstream infections (BSI) are classified according to the criteria used, either as laboratory-confirmed bloodstream infection (LCBI) or clinical sepsis (CSEP). CSEP may be used to report only primary BSI in neonates (≤ 30 days old) and infants (≤ 1 year old). Report BSIs that are central line-associated (i.e., a central line or umbilical catheter was in place at the time of, or within 48 hours before, onset of the event).
NOTE: There is no minimum period of time that the central line must be in place in order for the BSI to be considered central line-associated.

Location of attribution: The location where the patient was assigned on the date of the BSI event, which is further defined as the date when the first clinical evidence appeared or the date the specimen used to meet the BSI criteria was collected, whichever came first.
EXAMPLE: Patient has a central line inserted in the Emergency Department and then is admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria

for BSI. This is reported to NHSN as a CLABSI for the MICU, because the Emergency Department is not an inpatient location and no denominator data are collected there.
EXAMPLE: Patient on the urology ward of Hospital A had the central line removed and is discharged home a few hours later. The IP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a BSI. This CLABSI should be reported to NHSN for, and by, Hospital A and attributed to the urology ward. No additional catheter days are reported.
EXCEPTION: If a CLABSI develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below:

- Patient with a central line in place in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for BSI. This is reported to NHSN as a CLABSI for the SICU.
- Patient is transferred to the medical ward from the MSICU after having the central line removed. Within 24 hours, patient meets criteria for a BSI. This is reported to NHSN as a CLABSI for the MSICU.
- Patient with a central line in place is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for a BSI. This is reported to NHSN as a CLABSI for the CCU.

Central line: An intravascular catheter 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 BSI and counting central-line days in the NHSN system: Aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common femoral veins, and in neonates, the umbilical artery/vein.
NOTE: Neither the insertion site nor the type of device may be used to determine if a line qualifies as a central line. The device must terminate in one of these vessels or in or near the heart to qualify as a central line.
NOTE: An introducer is considered an intravascular catheter.
NOTE: Pacemaker wires and other nonlumened 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.

Infusion: The introduction of a solution through a blood vessel via a catheter lumen. This may include continuous infusions such as nutritional fluids or medications, or it may include intermittent infusions such as flushes or IV antimicrobial administration, or blood, in the case of transfusion or hemodialysis.

Umbilical catheter: A central vascular device inserted through the umbilical artery or vein in a neonate.

Temporary central line: A non-tunneled catheter.

Permanent central line: Includes

- Tunneled catheters, including certain dialysis catheters
- Implanted catheters (including ports)

Laboratory-confirmed bloodstream infection (LCBI): Must meet one of the following criteria:

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. (See Notes 1 and 2 below.)

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 skin contaminant (i.e., diphtheroids [*Corynebacterium* spp.], *Bacillus* [not *B. anthracis*] spp., *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., *Micrococcus* spp.) is cultured from two or more blood cultures drawn on separate occasions.

Criterion 3: Patient ≤ 1 year of age has at least one of the following signs or symptoms: fever (>38°C core) hypothermia (<36°C core), apnea, or bradycardia
and
signs and symptoms and positive laboratory results are not related to an infection at another site
and
common skin contaminant (i.e., diphtheroids [*Corynebacterium* spp.], *Bacillus* [not *B. anthracis*] spp., *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., *Micrococcus* spp.) is cultured from two or more blood cultures drawn on separate occasions. (See Notes 3, 4 and 5 below.)

NOTES:

1. In criterion 1, 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).
2. In criterion 1, the term "recognized pathogen" does not include organisms considered common skin contaminants (see criteria 2 and 3 for a list of common skin contaminants). A few of the recognized pathogens are *S. aureus*, *Enterococcus* spp., *E. coli*, *Pseudomonas* spp., *Klebsiella* spp., *Candida* spp., etc.

3. In criteria 2 and 3, the phrase "two or more blood cultures drawn on separate occasions" means 1) that blood from at least two blood draws were collected within two days of each other (e.g., blood draws on Monday and Tuesday or Monday and Wednesday would be acceptable for blood cultures drawn on separate occasions, but blood draws on Monday and Thursday would be too far apart in time to meet this criterion), and 2) that at least one bottle from each blood draw is reported by the laboratory as having grown the same common skin contaminant organism (i.e., is a positive blood culture). (See Note 4 for determining sameness of organisms.)
   a. For example, an adult patient has blood drawn at 8 a.m. and again at 8:15 a.m. of the same day. Blood from each blood draw is inoculated into two bottles and incubated (four bottles total). If one bottle from each blood draw set is positive for coagulase-negative staphylococci, this part of the criterion is met.
   b. For example, a neonate has blood drawn for culture on Tuesday and again on Saturday and both grow the same common skin contaminant. Because the time between these blood cultures exceeds the two-day period for blood draws stipulated in criteria 2 and 3, this part of the criteria is not met.
   c. A blood culture may consist of a single bottle for a pediatric blood draw due to volume constraints. Therefore, to meet this part of the criterion, each bottle from two or more draws would have to be culture-positive for the same skin contaminant.
4. There are several issues to consider when determining sameness of organisms.
   a. If the common skin contaminant 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), then it is assumed that the organisms are the same. The speciated organism should be reported as the infecting pathogen (see examples below).

Table 1. Examples of how to report speciated and unspeciated common skin contaminate organisms

Culture Report	**Companion Culture Report**	**Report as…**
S. epidermidis	*Coagulase-negative staphylococci*	*S. epidermidis*
Bacillus spp. (not *anthracis*)	*B. cereus*	*B. cereus*
S. salivarius	*Strep* viridans	*S. salivarius*

Table 2. Examples of how to interpret the sameness of two skin contaminate isolates by comparing antimicrobial susceptibilities			
Culture Report	**Isolate A**	**Isolate B**	**Interpret as…**
S. epidermidis	All drugs **S**	All drugs **S**	Same
S. epidermidis	OX **R** GENT **R**	OX **S** GENT **S**	Different
Corynebacterium spp.	PEN G **R** CIPRO **S**	PEN G **S** CIPRO **R**	Different
Strep viridans	All drugs **S**	All drugs **S** except ERYTH (**R**)	Same

   b. If common skin contaminant organisms from the cultures are speciated but no antibiograms are done or they are done for only one of the isolates, it is assumed that the organisms are the same.
   c. If the common skin contaminants from the cultures have antibiograms that are different for two or more antimicrobial agents, it is assumed that the organisms are not the same (see table below).
   d. For the purpose of NHSN antibiogram reporting, the category interpretation of intermediate (I) should not be used to distinguish whether two organisms are different.

5. LCBI criteria 1 and 2 may be used for patients of any age, including patients ≤ 1 year of age.

6. Specimen Collection Considerations:
   Ideally, blood specimens for culture should be obtained from two to four blood draws from separate venipuncture sites (e.g., right and left antecubital veins), not through a vascular catheter. These blood draws should be performed simultaneously or over a short period of time (i.e., within a few hours).[3,4] If your facility does not currently obtain specimens using this technique, you may still report BSIs using the criteria and notes above, but you should work with appropriate personnel to facilitate better specimen collection practices for blood cultures.

REPORTING INSTRUCTIONS:

- Purulent phlebitis confirmed with a positive semiquantitative culture of a catheter tip, but with either negative or no blood culture is considered a CVS-VASC, not a BSI.
- Report organisms cultured from blood as BSI – LCBI when no other site of infection is evident.
- Occasionally a patient with both peripheral and central IV lines develops a primary bloodstream infection (LCBI) that can clearly be attributed to the peripheral line (e.g., pus at the insertion site and matching pathogen from pus and blood). In this situation, enter ”Central Line = No” in the NHSN application. You should, however, count the patient’s central line days.

Clinical sepsis (CSEP): Must meet the following criterion:

Patient ≤ 1 year of age has at least one of the following clinical signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C, core), apnea, or bradycardia
and
blood culture not done or no organisms detected in blood
and
no apparent infection at another site
and
physician institutes treatment for sepsis.

REPORTING INSTRUCTIONS:
Report culture-positive infections of the bloodstream as BSI – LCBI.

Numerator Data: The *Primary Bloodstream Infection (BSI)* form (CDC 57.108) is used to collect and report each CLABSI that is identified during the month selected for surveillance. The *Instructions for Completion of Primary Bloodstream Infection Form* (Tables of Instructions, Tables 2 and 2a.) contains brief instructions for collection and entry of each data element on the form. The Primary BSI form includes patient demographic information on whether a central line was present, and, if so, the type of central line the patient had as appropriate to the location; these data will be used to calculate line-specific infection rates. Additional data include the specific criteria met for identifying the primary BSI, whether the patient died, the organisms isolated from blood cultures, and the organisms' antimicrobial susceptibilities.

Denominator Data: Device days and patient days are used for denominators (see Chapter 16 Key Terms). Device day denominator data that are collected differ according to the location of the patients being monitored. For ICUs and locations other than specialty care areas (SCAs) and NICUs, the number of patients with one or more central lines of any type is collected daily, at the same time each day, during the month and recorded on the *Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU or Specialty Care Area (SCA))* (CDC 57.118). Only the totals for the month are entered into NHSN.
For specialty care areas, the number of patients with one or more central lines is dichotomized into those with permanent central lines and those with temporary central lines on the *Denominators for Specialty Care Area* (CDC 57.117) form. Each is collected daily, at the same time each day. Only the total for the month are entered into NHSN. This distinction in lines is made because permanent lines are commonly used in patients frequenting these areas and may have lower rates of associated infection than central lines inserted for temporary use. If a patient has both a temporary and a permanent central line, count the day only as a temporary line day. The *Instructions for Completion of Denominators for Intensive Care Unit (ICU)/Other Locations form (*Tables of Instructions, Table 6*) form* and *Instructions for the Completion of*

Denominators for Specialty Care Areas (SCA) Form (Tables of Instructions, Table 7) contain brief instructions for collection and entry of each data element on the forms.

In NICUs, again because of differing infection risks, the number of patients with central lines and those with umbilical catheters is collected daily, at the same time each day, during the month. If a patient has both an umbilical catheter and a central line, count the day only as an umbilical catheter day. On the *Denominators for Neonatal Intensive Care Unit (NICU)* (CDC 57.116) form, patients are further stratified by birthweight in five categories since risk of BSI also varies by birthweight.
NOTE: The weight of the infant at the time of BSI is not used and should not be reported. For example, if a neonate weighs 1006 grams at birth but remains in the NICU for two months and has a body weight of 1650 grams when it develops a CLABSI, record the birthweight of 1006 grams on the BSI form. The *Instructions for Completion of Denominators for Neonatal Intensive Care Unit(NICU)* form *(*Tables of Instructions, Table 8*)* contains brief instructions for collection and entry of each data element on the forms.

Data Analyses: The CLABSI rate per 1000 central line days is calculated by dividing the number of CLABSI by the number of central line days and multiplying the result by 1000. The Central Line Utilization Ratio is calculated by dividing the number of central line days by the number of patient days. These calculations will be performed separately for different types of ICUs, specialty care areas, and other locations in the institution. Separate rates and ratios will also be calculated for different types of catheters in specialty care areas and NICUs, and for birthweight categories in NICUs, as appropriate.

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[1]Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[2] O'Grady NP, Alexander M, Dellinger EP, Gerberding JL, Heard SO, Maki DG, et al. Guidelines for the prevention of intravascular catheter-related infections. *MMWR* 2002;51(No. RR-10:1-26).

[3] Clinical and Laboratory Standards Institute (CLSI). *Principles and Procedures for Blood Cultures; Approved Guideline*. CLSI document M47-A (ISBN 1-56238-641-7). Clinical and Laboratory Standards Institute, 940 West Valley Road, Suite 1400, Wayne, Pennsylvania, 19087-1898 USA, 2007.

[4] Baron EJ, Weinstein MP, Dunne Jr WM, Yagupsky P, Welch DF, and Wilson DM. Blood Cultures IV. ASM Press: Washington, DC; 2005

Central Line Insertion Practices (CLIP) Adherence Monitoring

Introduction: Central line-associated bloodstream infections (CLABSIs) can be prevented through proper management of the central line. The CDC's Healthcare Infection Control Practices Advisory Committee (CDC/HICPAC) *Guidelines for the Prevention of Intravascular Catheter-Related Infections*[1] recommends evidence-based central line insertion practices known to reduce the risk of subsequent central line-associated bloodstream infection. These include handwashing by inserters, use of maximal sterile barriers during insertion, proper use of a skin antiseptic prior to insertion, and allowing that skin antiseptic to dry before catheter insertion. Despite the scientific evidence supporting these measures, several reports suggest that adherence to these practices remains low in US hospitals.

Several centers have found it useful to monitor adherence to evidence-based central line insertion practices as a method for identifying quality improvement opportunities and strategically targeting interventions. Feedback of adherence data has been a component of multifaceted interventions that have successfully reduced CLABSI rates.

Participation in NHSN CLIP surveillance enables participating facilities and CDC to:

- Monitor central line insertion practices in individual patient care units and facilities and to provide aggregate adherence data for all participating facilities. Facilities have the option of recording inserter-specific adherence data.
- Facilitate quality improvement by identifying specific gaps in adherence to recommended prevention practices, thereby helping to target intervention strategies for reducing central line-associated bloodstream infection rates.

Proposed future enhancements would allow facilities to link gaps in recommended practice with the clinical outcome (i.e., CLABSI) both in individual facilities and for all participating facilities.

Settings: Surveillance may occur in any type of patient care location where central lines are inserted.

Requirements: Surveillance for central line insertion practices in at least one location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Participating facilities may perform surveillance for insertion practices during a month when concomitant CLABSI surveillance is being conducted, or may collect insertion practice data during a month when no CLABSI surveillance is being conducted or in locations where CLABSI are not monitored (e.g., emergency department, operating room, etc.). If participating facilities wish to identify associations between insertion practices and outcomes (i.e., CLABSI), surveillance for insertion practices and CLABSI must be done concomitantly.

Numerator and Denominator Data: The *Central Line Insertion Practices Adherence Monitoring Form* (CDC 57.125) is used to collect and report central line insertion practices for every central line insertion occurring during the month in the unit(s) selected for surveillance. The *Instructions for Completion of the Central Line Insertion Practices Adherence Monitoring Form* (Tables of Instructions, Table 3) contains directions for collection and entry of each data element on the form. The form can be completed at or near the time of insertion either by the inserter or an observer present at the insertion (e.g., nurse assisting with the catheter insertion), or the form can be completed from documentation in the patient chart (e.g., if the elements of the monitoring form have been incorporated into standard central-line insertion procedure notes). The form includes information pertaining to demographics of the patient, information pertaining to the inserter, information on maximal sterile barriers used, the reasons for central line insertion, skin antisepsis, hand hygiene practice before insertion, type of central line and insertion site, and use of a guidewire. Elements of these data will be used to calculate adherence to recommended insertion practices.

Data Analyses: Adherence rates for specific insertion practices will be calculated by dividing the number of central line insertions during which the recommended practice was followed by the total number of central line insertions and multiplying the result by 100. Such calculations can also be done for a bundle of practices that have been shown to reduce the incidence of CLABSI. In NHSN, adherence to the bundle requires a "Yes" to all of the following:

- Hand hygiene performed
- Appropriate skin prep
    - Chlorhexidene gluconate (CHG) for patients ≥ 2 months old
    - Povidone iodine, alcohol, or CHG for children < 2 months old
- Skin prep agent has completely dried before insertion
- **All** 5 maximal sterile barriers used
    - Sterile gloves
    - Sterile gown
    - Cap
    - Mask worn
    - Large sterile drape

NOTE: CHG has not been labeled for use by the Food and Drug and Administration with patients < 2 months of age. Acceptance of CHG use for adherence to the CLIP bundle in this patient population does not reflect a recommendation of its use by the NHSN.

These calculations can be performed separately for different types of locations in the institution. Participants have the option of calculating inserter-specific adherence rates. Future enhancements to NSHN will allow the additional analysis option of generating a line list of patients in whom a central line was inserted, the insertion practices followed

during the insertion, and information on any subsequent CLABSI associated with that central line.

[1] O'Grady NP, Alexander M, Dellinger EP, Gerberding JL, Heard SO, Maki DG, et al. Guidelines for the prevention of intravascular catheter-related infections. *MMWR* 2002;51(No. RR-10:1-26).

Ventilator-Associated Pneumonia (VAP) Event

Introduction: In 2002, an estimated 250,000 healthcare-associated pneumonias developed in U.S. hospitals and 36,000 of these were associated with deaths.[1]Patients with mechanically-assisted ventilation have a high risk of developing healthcare-associated pneumonia. From 2006-2007, within NHSN facilities almost 5,400 VAPs were reported and incidence for various types of hospital units ranged from 2.1-11.0 per 1,000 ventilator days.[1]

Prevention and control of healthcare-associated pneumonia is discussed in the CDC/HICPAC document, *Guidelines for Prevention of Healthcare-Associated Pneumonia, 2003*[2]**.** The Guideline strongly recommends that surveillance be conducted for bacterial pneumonia in ICU patients who are mechanically ventilated to facilitate identification of trends and for interhospital comparisons.

Settings: Surveillance will occur in any of four types of inpatient locations: (1) ICU, (2) specialty care areas (SCAs) (includes hematology/oncology wards, bone marrow transplant units, solid organ transplant units, inpatient dialysis units, long term acute care areas), (3) NICU and (4) any other inpatient location in the institution where denominator data can be collected (e.g., surgical wards). NOTE: It is not required to monitor for VAPs after the patient is discharged from the facility, however, if discovered, a VAP should be reported to NHSN. No additional ventilator days are reported.

Requirements: Surveillance for VAP in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: Pneumonia (PNEU) is identified by using a combination of radiologic, clinical and laboratory criteria. The following pages outline the various assessment criteria that may be used for meeting the surveillance definition of healthcare-associated pneumonia (Tables 2-5 and Figures 1 and 2). Report PNEUs that are ventilator-associated (i.e., patient was intubated and ventilated at the time of or within 48 hours before the onset of the event).
NOTE: There is no minimum period of time that the ventilator must be in place in order for the PNEU to be considered ventilator-associated.

Location of attribution: The inpatient location where the patient was assigned on the date of the PNEU event, which is further defined as the date when the first clinical evidence appeared or the date the specimen used to meet the PNEU criterion was collected, whichever came first.
EXAMPLE: Patient is intubated and ventilated in the Operating Room and then is admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for PNEU. This is reported to NHSN as a VAP for the MICU, because the Operating Room is not an inpatient location and no denominator data are collected there.
EXAMPLE: Patient on the Respiratory ICU (RICU) of Hospital A had the endotracheal tube and ventilator removed and is discharged home a few hours later. The ICP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a PNEU. This VAP should

be reported to NHSN for, and by,Hospital A and attributed to the RICU. No additional ventilator days are reported.
EXCEPTION: If a VAP develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below:

- Patient on a ventilator in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for PNEU. This is reported to NHSN as a VAP for the SICU.
- Patient is transferred to the medical ward from the MSICU after having ventilator removed. Within 24 hours, the patient meets criteria for a PNEU. This is reported to NHSN as a VAP for the MSICU.
- Patient on a ventilator is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for a PNEU. This is reported to NHSN as a VAP for the CCU.

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, hypoCPAP) are not considered ventilators unless delivered via tracheostomy or endotracheal intubation (e.g., ET-CPAP).

General Comments Applicable to All Pneumonia Specific Site Criteria:

1. Physician's diagnosis of pneumonia alone is not an acceptable criterion for healthcare-associated pneumonia.
2. Although specific criteria are included for infants and children, pediatric patients may meet any of the other pneumonia specific site criteria.
3. Ventilator-associated pneumonia (i.e., pneumonia in persons who had a device to assist or control respiration continuously through a tracheostomy or by endotracheal intubation within the 48-hour period before the onset of infection, inclusive of the weaning period) should be so designated when reporting data.
4. When assessing a patient for presence of pneumonia, it is important to distinguish between changes in clinical status due to other conditions such as myocardial infarction, pulmonary embolism, respiratory distress syndrome, atelectasis, malignancy, chronic obstructive pulmonary disease, hyaline membrane disease, bronchopulmonary dysplasia, etc. Also, care must be taken when assessing intubated patients to distinguish between tracheal colonization, upper respiratory tract infections (e.g., tracheobronchitis), and early onset pneumonia. Finally, it should be recognized that it may be difficult to determine healthcare-associated pneumonia in the elderly, infants, and immunocompromised patients since such conditions may mask typical signs or symptoms associated with pneumonia. Alternate specific criteria for the elderly, infants and immunocompromised patients have been included in this definition of healthcare-associated pneumonia.
5. Healthcare-associated pneumonia can be characterized by its onset: early or late. Early onset pneumonia occurs during the first four days of hospitalization and is often caused by *Moraxella catarrhalis, H. influenzae*, and *s. pneumoniae*. Causative agents of late onset

pneumonia are frequently gram negative bacilli or *S. aureus*, including methicillin-resistant *S. aureus*. Viruses (e.g., Influenza A and B or Respiratory Syncytial Virus) can cause early and late onset healthcare-associated pneumonia, whereas yeasts, fungi, legionellae, and *Pneumocystis carinii* are usually pathogens of late onset pneumonia.

6. Pneumonia due to gross aspiration (for example, in the setting of intubation in the emergency room or operating room) is considered healthcare-associated if it meets any specific criteria and was not clearly present or incubating at the time of admission to the hospital.
7. Multiple episodes of healthcare-associated pneumonia may occur in critically ill patients with lengthy hospital stays. When determining whether to report multiple episodes of healthcare-associated pneumonia in a single patient, look for evidence of resolution of the initial infection. The addition of or change in pathogen alone is not indicative of a new episode of pneumonia. The combination of new signs and symptoms and radiographic evidence or other diagnostic testing is required.
8. Positive Gram stain for bacteria and positive KOH (potassium hydroxide) mount for elastin fibers and/or fungal hyphae from appropriately collected sputum specimens are important clues that point toward the etiology of the infection. However, sputum samples are frequently contaminated with airway colonizers and therefore must be interpreted cautiously. In particular, *Candida* is commonly seen on stain, but infrequently causes healthcare-associated pneumonia.

Table 1. Abbreviations used in PNEU laboratory criteria

BAL – bronchoalveolar lavage	LRT – lower respiratory tract
EIA – enzyme immunoassay	PCR – polymerase chain reaction
FAMA – fluorescent-antibody staining of membrane antigen	PMN – polymorphonuclear leukocyte
IFA – immunofluorescent antibody	RIA − radioimmunoassay

REPORTING INSTRUCTIONS:

- There is a hierarchy of specific categories within the major site pneumonia. Even if a patient meets criteria for more than one specific site, report only one:
    - If a patient meets criteria for both PNU1 and PNU2, report PNU2
    - If a patient meets criteria for both PNU2 and PNU3, report PNU3
    - If a patient meets criteria for both PNU1 and PNU3, report PNU3
- Report concurrent lower respiratory tract infection (e.g., abscess or empyema) and pneumonia with the same organism(s) as pneumonia
- Lung abscess or empyema without pneumonia are classified as LUNG
- Bronchitis, tracheitis, tracheobronchitis, or bronchiolitis without pneumonia are classified as BRON.

Table 2. Specific Site Algorithms for Clinically Defined Pneumonia (PNU1)

Radiology	**Signs/Symptoms/Laboratory**
Two or more serial chest radiographs with at least **one** of the following[1,2]: New or progressive and persistent infiltrate Consolidation Cavitation Pneumatoceles, in infants ≤ 1 year old	FOR ANY PATIENT, at least **one** of the following: -Fever (>38°C or >100.4°F) with no other recognized cause -Leukopenia (<4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) -For adults ≥70 years old, altered mental status with no other recognized cause **and** at least **two** of the following: -New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements -New onset or worsening cough, or dyspnea, or tachypnea[5] -Rales[6] or bronchial breath sounds -Worsening gas exchange (e.g. O_2 desaturations (e.g., $PaO_2/FiO_2 \leq 240$)[7], increased oxygen requirements, or increased ventilator demand)
NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), one definitive chest radiograph is acceptable.[1]	ALTERNATE CRITERIA, for infants ≤1 year old: Worsening gas exchange (e.g., O_2 desaturations, increased oxygen requirements, or increased ventilator demand) **and** at least **three** of the following: -Temperature instability with no other recognized cause -Leukopenia (<4000 WBC/mm^3) or leukocytosis (≥15,000 WBC/mm^3) and left shift (≥10% band forms) -New onset of purulent sputum[3] or change in character of sputum[4], or increased respiratory secretions or increased suctioning requirements -Apnea, tachypnea[5] , nasal flaring with retraction of chest wall or grunting -Wheezing, rales[6], or rhonchi -Cough -Bradycardia (<100 beats/min) or tachycardia (>170 beats/min)
	ALTERNATE CRITERIA, for child >1 year old or ≤ 12 years old, 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/mm^3) or leukocytosis (≥15,000 WBC/mm^3) -New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements -New onset or worsening cough, or dyspnea, apnea, or tachypnea[5]. -Rales[6] or bronchial breath sounds. -Worsening gas exchange (e.g. O_2 desaturations, increased oxygen requirements, or increased ventilator demand)

Table 3. Specific Site Algorithms for Pneumonia with Common Bacterial or Filamentous Fungal Pathogens and Specific Laboratory Findings (PNU2)

Radiology	Signs/Symptoms	Laboratory
Two or more serial chest radiographs with at least one of the following[1,2]: New or progressive and persistent infiltrate Consolidation Cavitation Pneumatoceles, in infants ≤ 1 year old NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), one definitive chest radiograph is acceptable.[1]	At least **one** of the following: Fever (>38°C or >100.4°F) with no other recognized cause Leukopenia (<4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) For adults ≥70 years old, altered mental status with no other recognized cause **and** at least **one** of the following: New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements New onset or worsening cough, or dyspnea or tachypnea[5] Rales[6] or bronchial breath sounds Worsening gas exchange (e.g. O_2 desaturations [e.g., $PaO_2/FiO_2 \leq 240$][7], increased oxygen requirements, or increased ventilator demand)	At least **one** of the following: Positive growth in blood culture[8] not related to another source of infection Positive growth in culture of pleural fluid Positive quantitative culture[9] from minimally contaminated LRT specimen (e.g., BAL or protected specimen brushing) ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (e.g., Gram stain) Histopathologic exam shows at least **one** of the following evidences of pneumonia: Abscess formation or foci of consolidation with intense PMN accumulation in bronchioles and alveoli Positive quantitative culture[9] of lung parenchyma Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae

Table 4. Specific Site Algorithms for Viral, Legionella, and other Bacterial Pneumonias with Definitive Laboratory Findings (PNU2)

Radiology	Signs/Symptoms	Laboratory
Two or more serial chest radiographs with at least one of the following[1,2]: New or progressive and persistent infiltrate Consolidation Cavitation Pneumatoceles, in infants ≤ 1 year old NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), one definitive chest radiograph is acceptable.[1]	At least **one** of the following: Fever (>38°C or >100.4°F) with no other recognized cause Leukopenia (<4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) For adults ≥70 years old, altered mental status with no other recognized cause **and** at least one of the following: New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements New onset or worsening cough or dyspnea, or tachypnea[5] Rales[6] or bronchial breath sounds Worsening gas exchange (e.g. O_2 desaturations [e.g., $PaO_2/FiO_2 \leq 240$][7], increased oxygen requirements, or increased ventilator demand)	At least **one** of the following[10-12]: Positive culture of virus or *Chlamydia* from respiratory secretions Positive detection of viral antigen or antibody from respiratory secretions (e.g., EIA, FAMA, shell vial assay, PCR) Fourfold rise in paired sera (IgG) for pathogen (e.g., influenza viruses, *Chlamydia*) Positive PCR for *Chlamydia* or *Mycoplasma* Positive micro-IF test for *Chlamydia* Positive culture or visualization by micro-IF of *Legionella* spp, from respiratory secretions or tissue. Detection of *Legionella pneumophila* serogroup 1 antigens in urine by RIA or EIA Fourfold rise in *L. pneumo*phila serogroup 1 antibody titer to ≥1:128 in paired acute and convalescent sera by indirect IFA.

Table5. Specific Site Algorithm for Pneumonia in Immunocompromised Patients (PNU3)

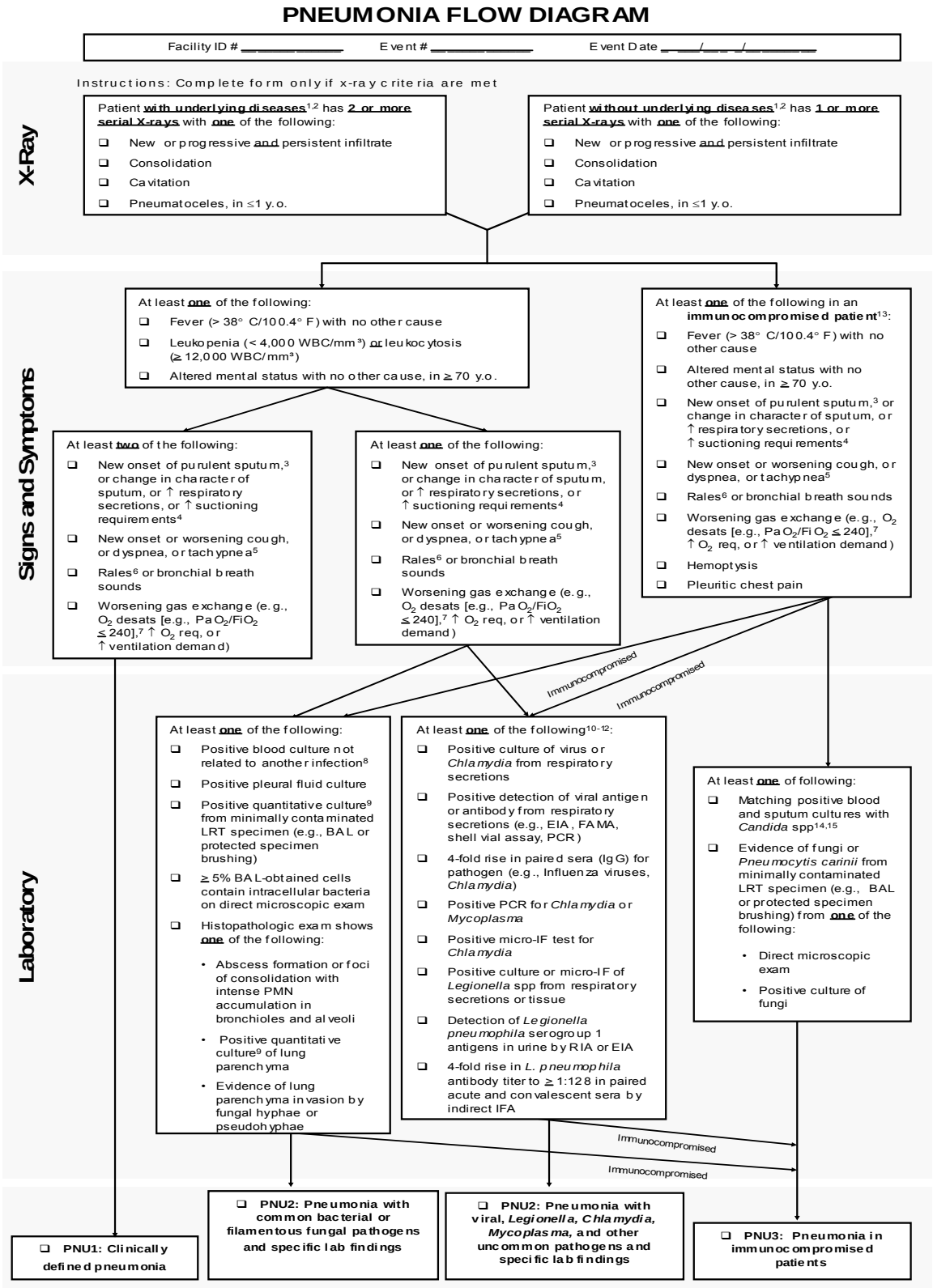
Radiology	Signs/Symptoms	Laboratory
Two or more serial chest radiographs with at least one of the following[1,2]: New or progressive and persistent infiltrate Consolidation Cavitation Pneumatoceles, in infants ≤ 1 year old NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), one definitive chest radiograph is acceptable.[1]	Patient who is immunocompromised[13] has at least **one** of the following: Fever (>38°C or >100.4°F) with no other recognized cause For adults ≥70 years old, altered mental status with no other recognized cause New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements New onset or worsening cough, or dyspnea, or tachypnea[5] Rales[6] or bronchial breath sounds Worsening gas exchange (e.g. O_2 desaturations [e.g., $PaO_2/FiO_2 \leq 240$][7], increased oxygen requirements, or increased ventilator demand) Hemoptysis Pleuritic chest pain	At least **one** of the following: Matching positive blood and sputum cultures with *Candida* spp. [14, 15] Evidence of fungi or *Pneumocystis carinii* from minimally contaminated LRT specimen (e.g., BAL or protected specimen brushing) from one of the following: - Direct microscopic exam - Positive culture of fungi Any of the following from **LABORATORY CRITERIA DEFINED UNDER PNU2**

Footnotes to Algorithms:

1. Occasionally, in nonventilated patients, the diagnosis of healthcare-associated pneumonia may be quite clear on the basis of symptoms, signs, and a single definitive chest radiograph. However, in patients with pulmonary or cardiac disease (for example, interstitial lung disease or congestive heart failure), the diagnosis of pneumonia may be particularly difficult. Other non-infectious conditions (for example, pulmonary edema from decompensated congestive heart failure) may simulate the presentation of pneumonia. In these more difficult cases, serial chest radiographs must be examined to help separate infectious from non-infectious pulmonary processes. To help confirm difficult cases, it may be useful to review radiographs on the day of diagnosis, 3 days prior to the diagnosis and on days 2 and 7 after the diagnosis. Pneumonia may have rapid onset and progression, but does not resolve quickly. Radiographic changes of pneumonia persist for several weeks. As a result, rapid radiographic resolution suggests that the patient does not have pneumonia, but rather a non-infectious process such as atelectasis or congestive heart failure.
2. Note that there are many ways of describing the radiographic appearance of pneumonia. Examples include, but are not limited to, “air-space disease”, “focal opacification”, “patchy areas of increased density”. Although perhaps not specifically delineated as pneumonia by the radiologist, in the appropriate clinical setting these alternative descriptive wordings should be seriously considered as potentially positive findings.

3. Purulent sputum is defined as secretions from the lungs, bronchi, or trachea that contain ≥25 neutrophils and ≤10 squamous epithelial cells per low power field (x100). If your laboratory reports these data qualitatively (e.g., "many WBCs" or "few squames"), be sure their descriptors match this definition of purulent sputum. This laboratory confirmation is required since written clinical descriptions of purulence are highly variable.
4. A single notation of either purulent sputum or change in character of the sputum, is not meaningful; repeated notations over a 24 hour period would be more indicative of the onset of an infectious process. Change in character of sputum refers to the color, consistency, odor and quantity.
5. In adults, tachypnea is defined as respiration rate >25 breaths per minute. Tachypnea is defined as >75 breaths per minute in premature infants born at <37 weeks gestation and until the 40th week; >60 breaths per minute in patients <2 months old; >50 breaths per minute in patients 2-12 months old; and >30 breaths per minute in children >1 year old.
6. Rales may be described as "crackles".
7. This measure of arterial oxygenation is defined as the ratio of the arterial tension (PaO_2) to the inspiratory fraction of oxygen (FiO_2).
8. Care must be taken to determine the etiology of pneumonia in a patient with positive blood cultures and radiographic evidence of pneumonia, especially if the patient has invasive devices in place such as intravascular lines or an indwelling urinary catheter. In general, in an immunocompetent patient, blood cultures positive for coagulase negative staphylococci, common skin contaminants, and yeasts will not be the etiologic agent of the pneumonia.
9. Refer to Threshold values for cultured specimens (Table 6). An endotracheal aspirate is not a minimally contaminated specimen. Therefore, an endotracheal aspirate does not meet the laboratory criteria.
10. Once laboratory-confirmed cases of pneumonia due to respiratory syncytial virus (RSV), adenovirus, or influenza virus have been identified in a hospital, clinician's presumptive diagnosis of these pathogens in subsequent cases with similar clinical signs and symptoms is an acceptable criterion for presence of healthcare-associated infection.
11. Scant or watery sputum is commonly seen in adults with pneumonia due to viruses and *Mycoplasma* although sometimes the sputum may be mucopurulent. In infants, pneumonia due to RSV or influenza yields copious sputum. Patients, except premature infants, with viral or mycoplasmal pneumonia may exhibit few signs or symptoms, even when significant infiltrates are present on radiographic exam.
12. Few bacteria may be seen on stains of respiratory secretions from patients with pneumonia due to *Legionella* spp, mycoplasma, or viruses.
13. Immunocompromised patients include those with neutropenia (absolute neutrophil count <500/mm^3), leukemia, lymphoma, HIV with CD4 count <200, or splenectomy; those who are early post-transplant, are on cytotoxic chemotherapy, or are on high dose steroids (e.g., >40mg of prednisone or its equivalent (>160mg hydrocortisone, >32mg methylprednisolone, >6mg dexamethasone, >200mg cortisone) daily for >2weeks).
14. Blood and sputum specimens must be collected within 48 hours of each other.
15. Semiquantitative or nonquantitative cultures of sputum obtained by deep cough, induction, aspiration, or lavage are acceptable. If quantitative culture results are available, refer to algorithms that include such specific laboratory findings.

Fiaure 1.


PNEUMONIA FLOW DIAGRAM
Facility ID # _____. Event # _____. Event Date __/__/__
Instructions: Complete form only if x-ray criteria are met
X-Ray
Patient with underlying diseases[1,2] has 2 or more serial X-rays with one of the following:
❑ New or progressive and persistent infiltrate
❑ Consolidation
❑ Cavitation
❑ Pneumatoceles, in ≤1 y.o.
Patient without underlying diseases[1,2] has 1 or more serial X-rays with one of the following:
❑ New or progressive and persistent infiltrate
❑ Consolidation
❑ Cavitation
❑ Pneumatoceles, in ≤1 y.o.
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.
At least two of the following:
❑ New onset of purulent sputum,[3] or change in character of sputum, or ↑ respiratory secretions, or ↑ suctioning requirements[4]
❑ New onset or worsening cough, or dyspnea, or tachypnea[5]
❑ Rales[6] or bronchial breath sounds
❑ Worsening gas exchange (e.g., O_2 desats [e.g., PaO_2/FiO_2 ≤ 240],[7] ↑ O_2 req, or ↑ ventilation demand)
At least one of the following:
❑ New onset of purulent sputum,[3] or change in character of sputum, or ↑ respiratory secretions, or ↑ suctioning requirements[4]
❑ New onset or worsening cough, or dyspnea, or tachypnea[5]
❑ Rales[6] or bronchial breath sounds
❑ Worsening gas exchange (e.g., O_2 desats [e.g., PaO_2/FiO_2 ≤ 240],[7] ↑ O_2 req, or ↑ ventilation demand)
At least one of the following in an immunocompromised patient[13]:
❑ Fever (> 38° C/100.4° F) with no other cause
❑ Altered mental status with no other cause, in ≥ 70 y.o.
❑ New onset of purulent sputum,[3] or change in character of sputum, or ↑ respiratory secretions, or ↑ suctioning requirements[4]
❑ New onset or worsening cough, or dyspnea, or tachypnea[5]
❑ Rales[6] or bronchial breath sounds
❑ Worsening gas exchange (e.g., O_2 desats [e.g., PaO_2/FiO_2 ≤ 240],[7] ↑ O_2 req, or ↑ ventilation demand)
❑ Hemoptysis
❑ Pleuritic chest pain
Immunocompromised
Immunocompromised
Laboratory
At least one of the following:
❑ Positive blood culture not related to another infection[8]
❑ Positive pleural fluid culture
❑ Positive quantitative culture[9] from minimally contaminated LRT specimen (e.g., BAL or protected specimen brushing)
❑ ≥ 5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam
❑ Histopathologic exam shows one of the following:
• Abscess formation or foci of consolidation with intense PMN accumulation in bronchioles and alveoli
• Positive quantitative culture[9] of lung parenchyma
• Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae
At least one of the following[10-12]:
❑ Positive culture of virus or *Chlamydia* from respiratory secretions
❑ Positive detection of viral antigen or antibody from respiratory secretions (e.g., EIA, FAMA, shell vial assay, PCR)
❑ 4-fold rise in paired sera (IgG) for pathogen (e.g., Influenza viruses, *Chlamydia*)
❑ Positive PCR for *Chlamydia* or *Mycoplasma*
❑ Positive micro-IF test for *Chlamydia*
❑ Positive culture or micro-IF of *Legionella* spp from respiratory secretions or tissue
❑ Detection of *Legionella pneumophila* serogroup 1 antigens in urine by RIA or EIA
❑ 4-fold rise in *L. pneumophila* antibody titer to ≥ 1:128 in paired acute and convalescent sera by indirect IFA
At least one of following:
❑ Matching positive blood and sputum cultures with *Candida* spp[14,15]
❑ Evidence of fungi or *Pneumocytis carinii* from minimally contaminated LRT specimen (e.g., BAL or protected specimen brushing) from one of the following:
• Direct microscopic exam
• Positive culture of fungi
Immunocompromised
Immunocompromised
❑ PNU1: Clinically defined pneumonia
❑ PNU2: Pneumonia with common bacterial or filamentous fungal pathogens and specific lab findings
❑ PNU2: Pneumonia with viral, *Legionella*, *Chlamydia*, *Mycoplasma*, and other uncommon pathogens and specific lab findings
❑ PNU3: Pneumonia in immunocompromised patients

1

Figure 2.

PNEUMONIA FLOW DIAGRAM
ALTERNATE CRITERIA FOR INFANTS AND CHILDREN

Facility ID # _____ Event # _____ Event Date __ __/__ __/_____

Instructions: Complete form only if x-ray criteria are met

X-Ray

Patient **with underlying diseases**[1,2] has **2 or more serial X-rays** with **one** of the following:

- ❑ New or progressive and persistent infiltrate
- ❑ Consolidation
- ❑ Cavitation
- ❑ Pneumatoceles, in ≤1 y.o.

Patient without underlying diseases[1,2] has **1 or more serial X-rays** with **one** of the following:

- ❑ New or progressive and persistent infiltrate
- ❑ Consolidation
- ❑ Cavitation
- ❑ Pneumatoceles, in ≤1 y.o.

Signs and Symptoms

Infants ≤ 1 y.o.

- ❑ Worsening gas exchange (e.g., O_2 desats [e.g., pulse oximetry <94%], ↑ O_2 req, or ↑ ventilation demand)

and **three** of the following:

- ❑ Temperature instability with no other recognized cause
- ❑ Leukopenia (< 4,000 WBC/mm³) or leukocytosis (≥ 15,000 WBC/mm³) and left shift (≥ 10% band forms)
- ❑ New onset of purulent sputum,[3] or change in character of sputum[4], or ↑ respiratory secretions, or ↑ suctioning requirements
- ❑ Apnea, tachypnea[5], nasal flaring with retraction of chest wall or grunting
- ❑ Wheezing, rales[6], or rhonchi
- ❑ Cough
- ❑ Bradycardia (<100 beats/min.) or tachycardia (> 170 beats/min.)

Children >1 or ≤ 12 y.o.

At least **three** of the following:

- ❑ Fever (>38.4° C/101.1° F) or hypothermia (< 36.5° C/97.7°F) with no other recognized cause
- ❑ Leukopenia (< 4,000 WBC/mm³) or leukocytosis (≥ 15,000 WBC/mm³)
- ❑ New onset of purulent sputum,[3] or change in character of sputum[4], or ↑ respiratory secretions, or ↑ suctioning requirements
- ❑ New onset or worsening cough, or dyspnea, apnea, or tachypnea[5]
- ❑ Rales[6] or bronchial breath sounds
- ❑ Worsening gas exchange (e.g., O_2 desats [e.g., pulse oximetry < 94%], ↑ O_2 req, or ↑ ventilation demand)

❑ **PNU1:**

Clinically defined pneumonia

1

Table 6 Threshold values for cultured specimens used in the diagnosis of pneumonia

Specimen collection/technique	Values
Lung parenchyma*	$\geq 10^4$ cfu/g tissue
Bronchoscopically (B) obtained specimens	
Bronchoalveolar lavage (B-BAL)	$\geq 10^4$ cfu/ml
Protected BAL (B-PBAL)	$\geq 10^4$ cfu/ml
Protected specimen brushing (B-PSB)	$\geq 10^3$ cfu/ml
Nonbronchoscopically (NB) obtained (blind) specimens	
NB-BAL	$>10^4$ cfu/ml
NB-PSB	$\geq 10^3$ cfu/ml

cfu = colony forming units
g = gram
ml = milliliter

COMMENT:
* Open-lung biopsy specimens and immediate post-mortem specimens obtained by transthoracic or transbronchial biopsy

Numerator Data: The *Pneumonia (PNEU)* from (CDC 57.111) is used to collect and report each VAP that is identified during the month selected for surveillance. The *Instructions for Completion of Pneumonia Form* (Tables of Instructions, Tables 4 and 2a) includes brief instructions for collection and entry of each data element on the form. The pneumonia form includes patient demographic information and information on whether or not mechanically assisted ventilation was present. Additional data include the specific criteria met for identifying pneumonia, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

Denominator data: Device days and patient days are used for denominators (see Chapter 16 Key Terms). Ventilator days, which are the number of patients managed with a ventilatory device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.116, 57.117, and 57.118). These daily counts are summed and only the total for the month is entered into NHSN. Ventilator and patient days are collected for each of the locations monitored.

Data Analyses: The VAP rate per 1000 ventilator days is calculated by dividing the number of VAPs by the number of ventilator days and multiplying the result by 1000. The Ventilator Utilization Ratio is calculated by dividing the number of ventilator days by the number of patient days. These calculations will be performed separately for the different types of ICUs, SCAs, and other locations in the institution, as well as by each birthweight category in NICUs.

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[1]Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

2 Centers for Disease Control and Prevention. Guidelines for preventing health-care-associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. MMWR 2004;53(No. RR-3).

Catheter-Associated Urinary Tract Infection (CAUTI) Event

Introduction: The urinary tract is the most common site of healthcare-associated infection, accounting for more than 30% of infections reported by acute care hospitals[1]. Virtually all healthcare- associated urinary tract infections (UTIs) are caused by instrumentation of the urinary tract.

CAUTI can lead to such complications as cystitis, pyelonephritis, gram-negative bacteremia, prostatitis, epididymitis, and orchitis in males and, less commonly, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis in all patients. Complications associated with CAUTI cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality. Each year, more than 13,000 deaths are associated with UTIs.[1]

Prevention of CAUTIs is discussed in the CDC/HICPAC document, *Guideline for Prevention of Catheter-associated Urinary Tract Infections*[2].

Settings: Surveillance will occur in any of three types of inpatient locations: (1) ICUs, (2) SCAs (includes hematology/oncology wards, bone marrow transplant units, solid organ transplant units, inpatient dialysis units, long term acute care areas), and (3) any other inpatient location in the institution where denominator data can be collected (e.g., surgical wards).
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 indwelling catheter days are reported.

Requirements: Surveillance for CAUTI is performed in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions:
Urinary tract infections (UTI) are defined using symptomatic urinary tract infection (SUTI) criteria or Asymptomatic Bacteremic UTI (ABUTI) criteria (Table 1 and Figure 1). Report UTIs that are catheter-associated (i.e. patient had an indwelling urinary catheter at the time of or within 48 hours before onset of the event). NOTE: There is no minimum period of time that the catheter must be in place in order for the UTI to be considered catheter-associated. NOTE: SUTI 1b and 2b and other UTI (OUTI) cannot be catheter-associated.
EXAMPLE: Patient has a Foley catheter in place on an inpatient unit. It is discontinued, and 4 days later patient meets the criteria for a UTI. This is not reported as a CAUTI because the time since Foley discontinuation exceeds 48 hours.

Location of attribution: The location where the patient was assigned on the date of the UTI event, which is further defined as the date when the first clinical evidence appeared or the date the specimen use to meet the criterion was collected, whichever came first.
EXAMPLE: Patient has a Foley catheter inserted in the Emergency Department and then is admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for UTI. This is reported to the NHSN as a CAUTI for the MICU, because the Emergency Department is not an inpatient location and no denominator data are collected there.
EXAMPLE: Patient on the urology ward of Hospital A had the Foley catheter removed and is discharged home a few hours later. The ICP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a UTI. This CAUTI should be reported to NHSN for Hospital A and attributed to the urology ward.
EXCEPTION: If a CAUTI develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below.

- Patient with a Foley catheter in place in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the SICU.
- Patient is transferred to the medical ward from the MSICU after having the Foley catheter removed. Within 24 hours, patient meets criteria for a UTI. This is reported to NHSN as a CAUTI for the MSICU.
- Patient with a Foley catheter in place is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the CCU.

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.

Numerator Data: The *Urinary Tract Infection (UTI*) F*orm* (CDC 57.114) is used to collect and report each CAUTI that is identified during the month selected for surveillance. The *Instructions for Completion of Urinary Tract Infection Form* (Tables of Instructions, Tables 5 and 2a) includes brief instructions for collection and entry of each data element on the form. The UTI form includes patient demographic information and information on whether or not an indwelling urinary catheter was present. Additional data include the specific criteria met for identifying the UTI, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

Denominator data: Device days and patient days are used for denominators (See Chapter 16 Key Terms). Indwelling urinary catheter days, which are the number of patients with an indwelling urinary catheter device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.116,

57.117, and 57.118). These daily counts are summed and only the total for the month is entered into NHSN. Indwelling urinary catheter days and patient days are collected separately for each of the locations monitored.

Data Analyses: The CAUTI rate per 1000 urinary catheter days is calculated by dividing the number of CAUTIs by the number of catheter days and multiplying the result by 1000. The Urinary Catheter Utilization Ratio is calculated by dividing the number of urinary catheter days by the number of patient days. These calculations will be performed separately for the different types of ICUs, specialty care areas, and other locations in the institution, except for neonatal locations.

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[1]Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[2] Wong ES. Guideline for prevention of catheter-associated urinary tract infections. Infect Control 1981;2:126-30.

Table 1-Urinary Tract Infection Criteria

Criterion	**Symptomatic Urinary Tract Infection (SUTI)** Must meet at least 1 of the following criteria:
1a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms.
1b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
2a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 or ≥3 WBC/high power

Table 1-Urinary Tract Infection Criteria

	field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.
2b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.
3	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
4	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* a positive urinalysis demonstrated by at least one of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of between $\geq 10^3$ and $<10^5$ CFU/ml with no more than two species of microorganisms.
Criterion	**Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)**
	Patient with or without an indwelling urinary catheter has no signs or symptoms (i.e., no fever (>38°C) for patients ≤65 years of age*; and for any age patient no urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness, OR for a patient ≤1 year of age, no fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting) *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of uropathogen microorganisms** *and* a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture. *Fever is not diagnostic for UTI in the elderly (>65 years of age) and therefore fever in this age group does not disqualify from meeting the criteria of an ABUTI. **Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*, and *Corynebacterium* (urease positive).
Comments	• Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection. • Urine cultures must be obtained using appropriate technique, such as clean catch collection or

Table 1-Urinary Tract Infection Criteria

	catheterization. Specimens from indwelling catheters should be aspirated through the disinfected sampling ports. • In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by catheterization or suprapubic aspiration. • 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. • Urine specimen labels should indicate whether or not the patient is symptomatic. • Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI). • Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified* (COS) or, as *C. urealyticum (CORUR) if so speciated.*
Criterion	**Other Urinary Tract Infection (OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperineal or perinephric space)** Other infections of the urinary tract must meet at least 1 of the following criteria:
1	Patient has microorganisms isolated from culture of fluid (other than urine) or tissue from affected site.
2	Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination.
3	Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
4	Patient ≤ 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, lethargy, or vomiting *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection, (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
Comment	• Report infections following circumcision in newborns as SST-CIRC.

Identification and Categorization of SUTI Indwelling Catheter Discontinued in Prior 48 Hours

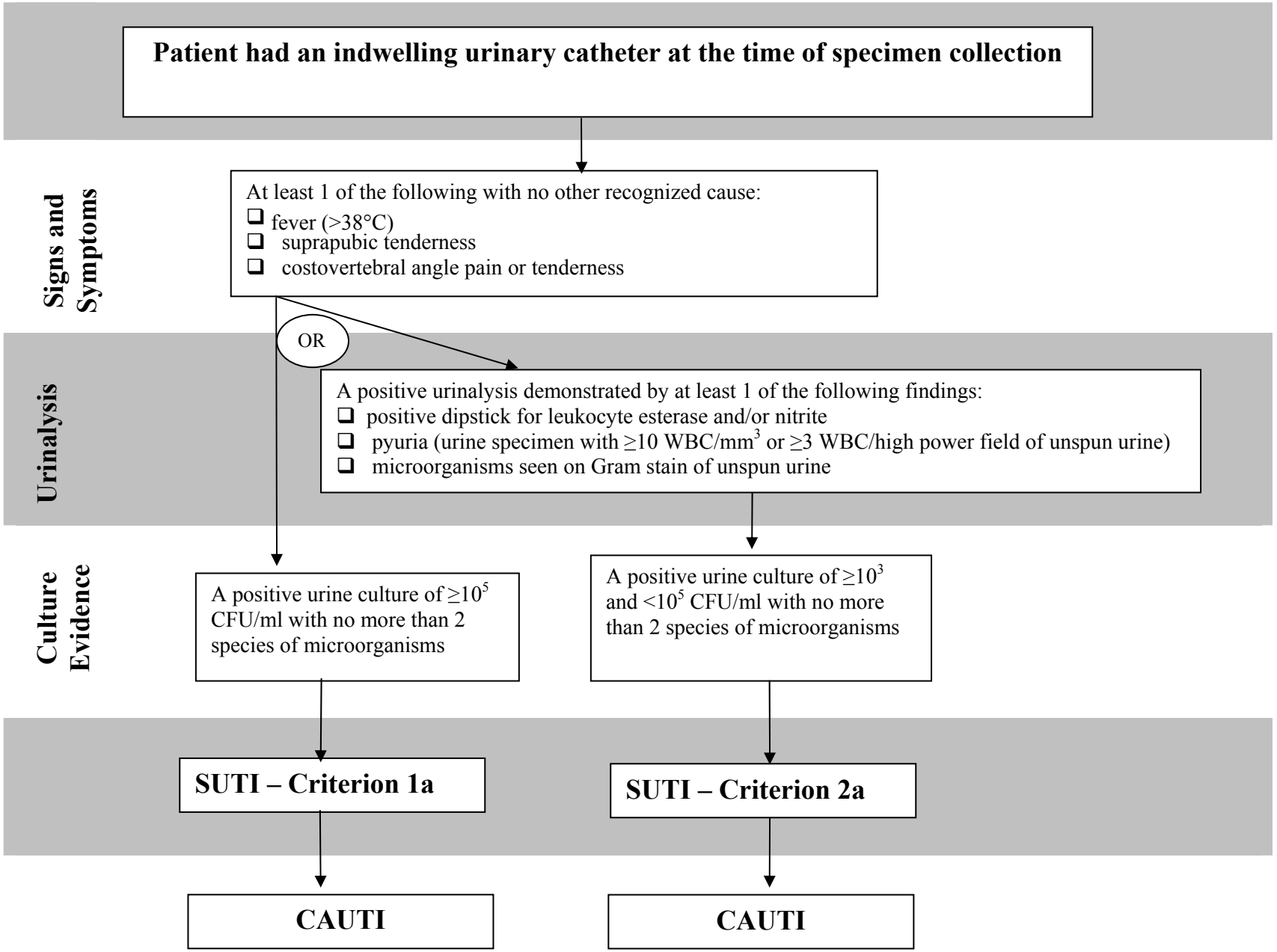
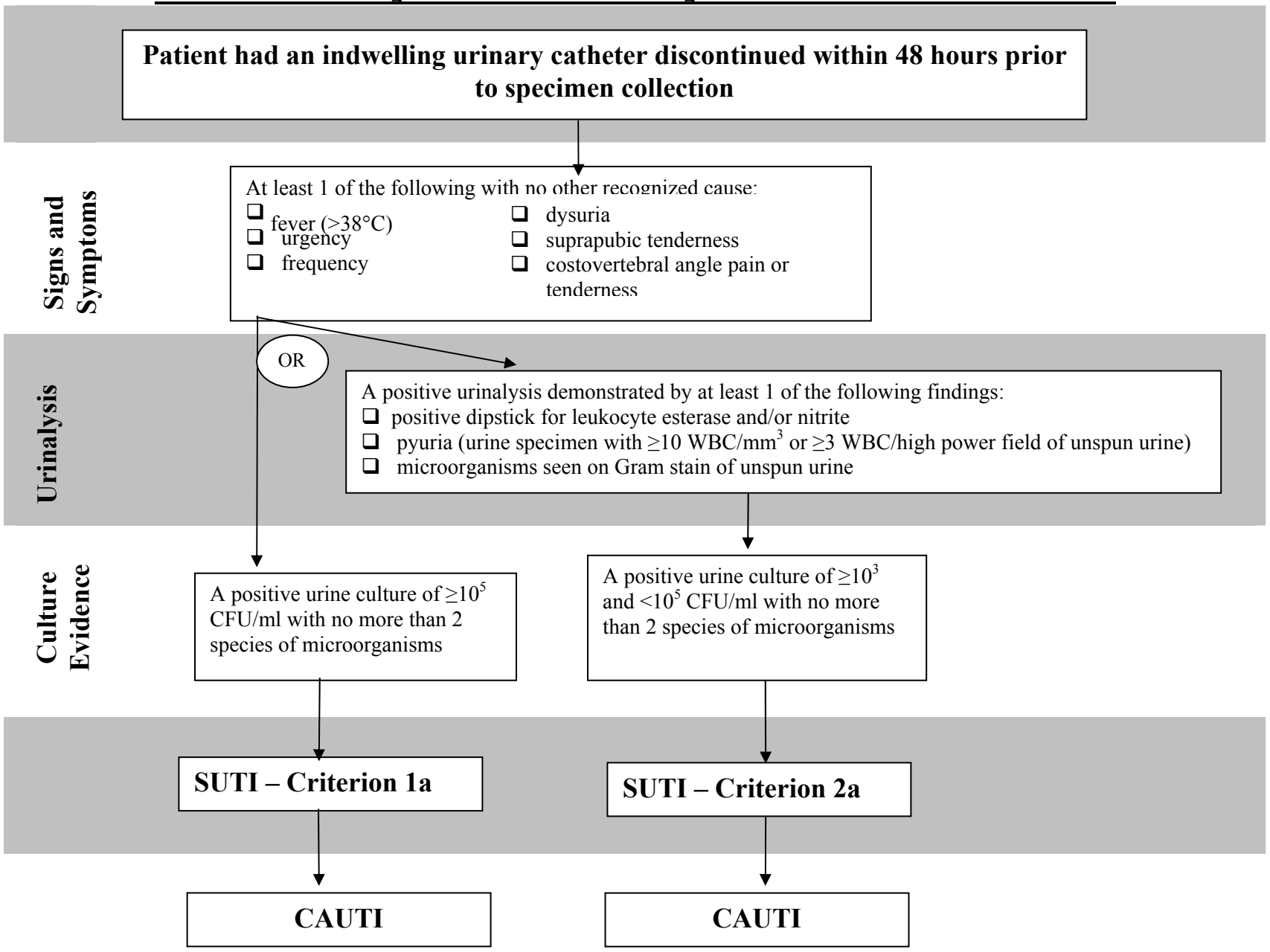


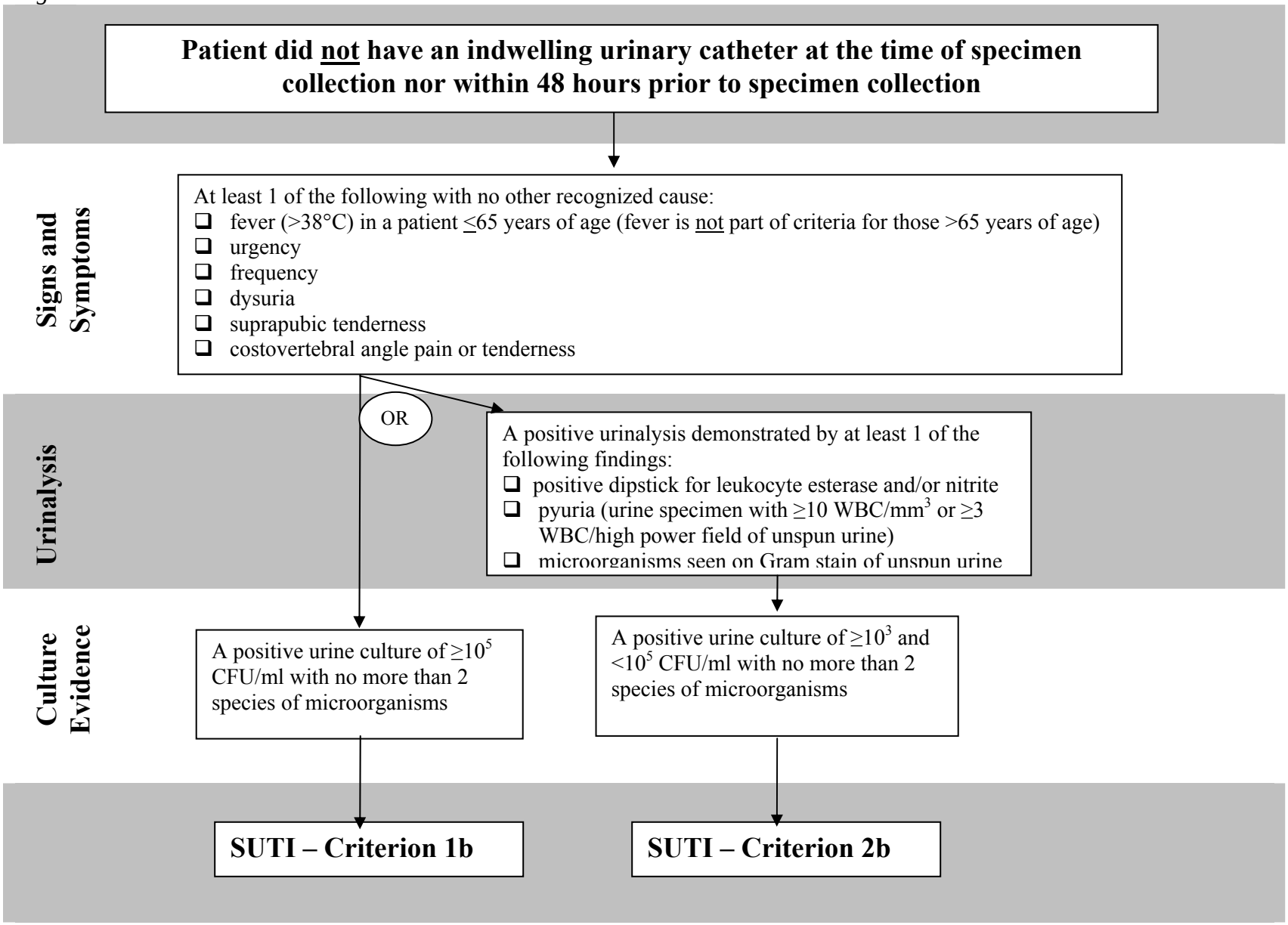
Figure 2.

Identification and Categorization of SUTI Indwelling Catheter Discontinued in Prior 48 Hours



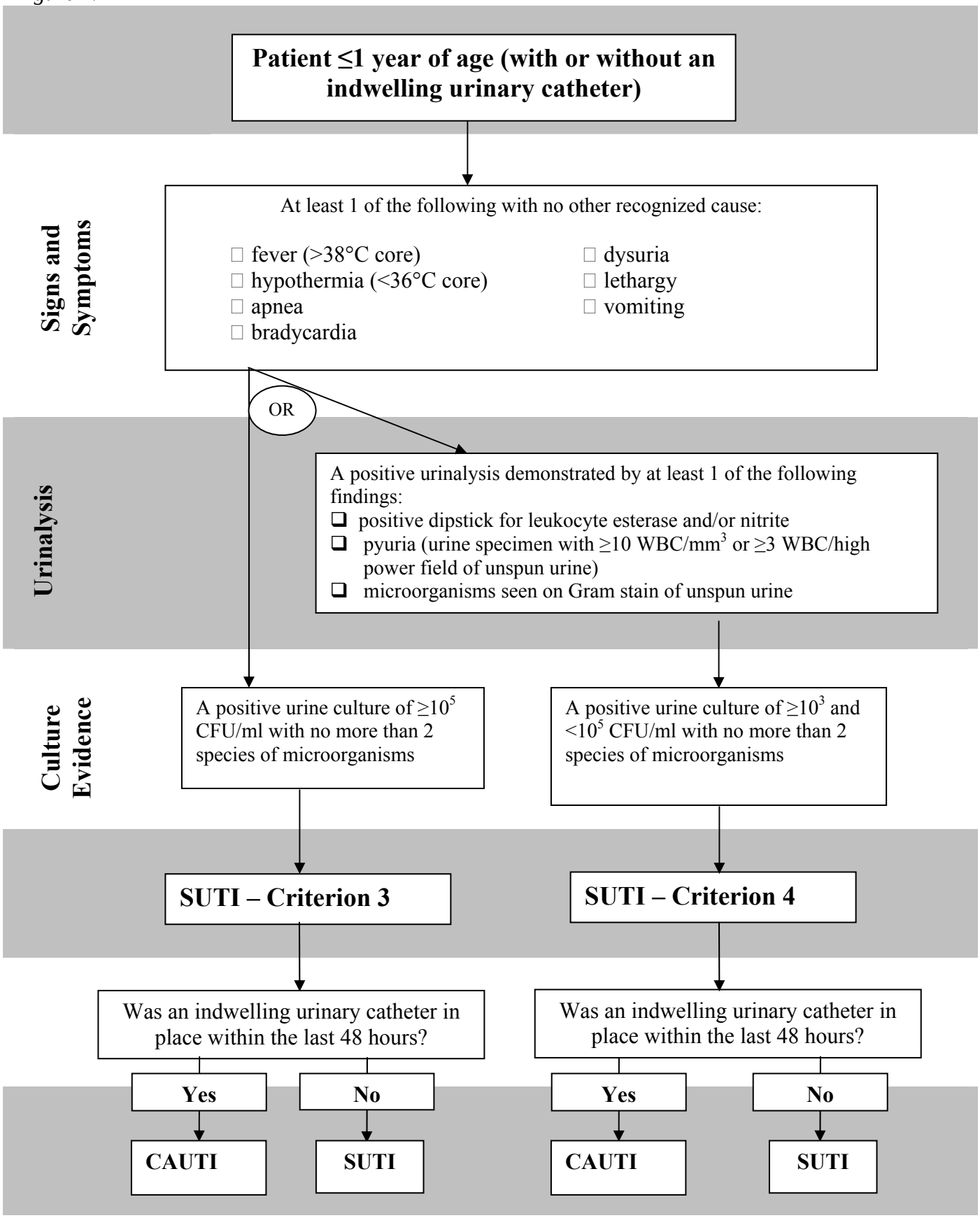
Identification and Categorization of SUTI Without Indwelling Catheter at Time of or Within 48 Hours Prior to Specimen Collection

Figure 3.



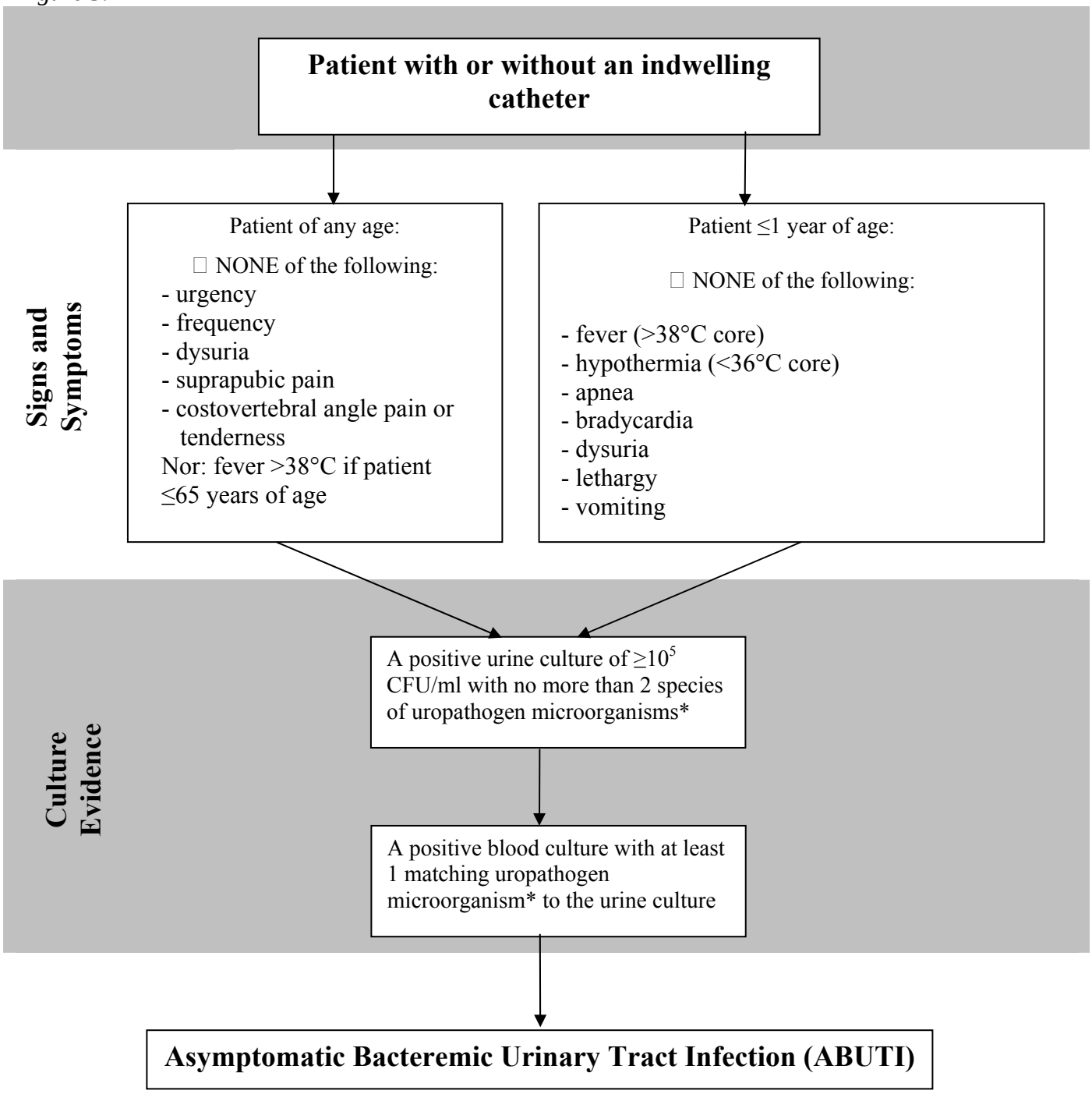
Identification and Categorization of SUTI in Patient ≤1 Year of Age

Figure 4.



Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

Figure 5.



*Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*, *Corynebacterium* (urease positive)[†].

[†]Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified* (COS) or, as *C. urealyticum (CORUR) if so speciated.*.

Dialysis Event (DE)

Introduction: In 2004, >309,000 patients were being treated with chronic hemodialysis in the United States.[1] Hemodialysis patients require a vascular access, which can either be a large blood vessel or catheter that can be punctured to remove and replace blood. Bacteremias and localized infections of the vascular access site are common in hemodialysis patients[2,3,4,5,6]. The vascular access types, which are ordered according to increasing risk of infection, include arteriovenous fistulas created from the patient's own blood vessels; arteriovenous grafts constructed from synthetic materials; permanent central lines; and temporary central lines. Port access devices for hemodialysis have been removed from the market, but some existing ports may still be used. The risk of infection is relatively high in these devices. Because of frequent hospitalizations and receipt of antimicrobial drugs, hemodialysis patients are at high risk for infection with drug-resistant bacteria.

Settings: Surveillance will occur in patients who are treated in outpatient hemodialysis centers. These may be attached to or affiliated with a hospital, but should serve mostly hemodialysis outpatients.

Requirements: Surveillance for Dialysis Events (Des) for at least one month among chronic hemodialysis patients at an outpatient hemodialysis facility as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions:

Hospitalization: The patient stayed overnight in a hospital, not just those related to infections or those where the patient was directly admitted from the dialysis unit. Each time a patient is hospitalized (no matter how soon after the last hospitalization), enter it as a new event. If the patient was hospitalized and returns to the dialysis unit on IV antimicrobials, both will be included in the same event -- do NOT enter a second event.

IV antimicrobial start: Include all IV antimicrobial starts, not just those with vancomycin or for a vascular access problem. If IV antimicrobials are stopped for less than 21 days and then restarted, this is NOT considered a new event. However, if IV antimicrobials are stopped for ≥21 days and then restarted, this is considered a new event.

Positive blood culture: Include all patients with a positive blood culture even if they did not have an associated hospitalization or in-unit IV antimicrobial start. Include blood cultures taken as an outpatient or within 1 day after a hospital admission. If the patient had an associated hospitalization or in-unit IV antimicrobial start, use the appropriate rule (above) for entering the event; if the patient had neither, enter a new event for positive blood cultures occurring 21 days or more after a previous positive blood culture.

The following specific types of outcome DEs are determined with a computer algorithm from data.

Local access infection: Pus, redness, or swelling of the vascular access site and access-associated bacteremia was not present and patient was hospitalized or had initiation of an IV antimicrobial agent.

Access-associated bacteremia: Blood culture positive with source identified as the vascular access site or unknown.

Vascular access infection: Either local access infection or access-associated bacteremia.

Numerator Data: For each patient with a hospitalization, outpatient IV antimicrobial start, or positive blood culture, participating dialysis centers will complete one *Dialysis Event* form (CDC 57.109) (see Definitions). The *Instructions for Completion of Dialysis Event* form (Tables of Instructions, Tables 9 and 2a) includes patient demographic information and brief instructions for collection and entry of each data element on the form.

Denominator Data: The number of chronic hemodialysis patients with each access type who received hemodialysis at the center during the first two working days of the month is recorded on the *Denominators for Outpatient Dialysis Form* (CDC 57.119). These data are used to estimate the number of patient-months. Only chronic hemodialysis outpatients are included. The *Instructions for Completion of Denominators for Outpatient Dialysis* (Tables of Instructions, Table 10) includes brief instructions for collection and entry of each data element on the form.

Data Analyses: The numbers of various events are tabulated, and rates of these events per 100 patient-months calculated by dividing the number of events by the number of patient-months and multiplying the result by 100. These rates are stratified by vascular access type and compared to the mean rate of all centers combined.

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[1]Klevens RM, Edwards JR, Andrus ML, Peterson KD, Dudeck MA, Horan TC. Dialysis Surveillance Report: national Healthcare Safety Network (NHSN)-data summary for 2006. Seminars in Dialysis 2008;21 (1):24-28.

[2] Kessler M, Hoen B, Mayeux D, Hestin D, Fontenaille C. Bacteremia in patients on chronic hemodialysis. Nephron 1993;64:95-100.

[3] Stevenson KB, Adcox MJ, Mallea MC, Narasimhan N, Wagnild JP. Standardized surveillance of hemodialysis vascular access infections: 18-month experience at an outpatient, multicenter hemodialysis center. Infect Control Hosp Epidemiol 2000;21:200-3.

[4] Tokars JI, Light P, Anderson J, Miller E, Parrish J, Armistead N, et al. A prospective study of vascular access infections at seven outpatient hemodialysis centers. Am J Kidney Dis 2001;37:1232-40.

[5] Kaplowitz LG, Comstock JA, Landwehr DM, Dalton HP, Mayhall CG. A prospective study of infections in hemodialysis patients: patient hygiene and other risk factors for infection. Infect Control Hosp Epidemiol 1988;9:534-41

[6] Tokars J, Stein G, Frank M, the Dialysis Surveillance Network. The influence of blood culture frequency on reported bactermia in hemodialysis outpatients. Abstract presented at the Society for Healthcare Epidemiology of America, Salt Lake City, UT, April 2002.

Surgical Site Infection (SSI) Event

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

While advances have been made in infection control practices, including improved operating room ventilation, sterilization methods, barriers, surgical technique, and availability of antimicrobial prophylaxis, SSIs remain a substantial cause of morbidity and mortality among hospitalized patients. In one study, among nearly 100,000 HAIs reported in one year, deaths were associated with SSIs in more than 8,000 cases.[2]

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

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

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

The *International Classification of Diseases, 9th Revision Clinical Modifications* (ICD 9-CM) codes , which are defined by the ICD 9 Coordination and Maintenance Committee of the National Center for Health Statistics and the Centers for Medicare and Medicaid Services (CMS), are developed as a tool for classification of morbidity data. The preciseness of the data, as well as their wide use, allows their use in grouping surgery types for the purpose of determining surgical site infection (SSI) rates. ICD9-CM codes are updated annually in October and NHSN operative procedure categories are subsequently updated and changes shared with NHSN users. Table 1 below, outlines operative procedures and their grouping into NHSN operative procedure categories according to ICD 9-CM codes. A brief description of the types of operations contained in the NSHN operative procedure categories is also provided.

Table 1. NHSN Operative Procedure Categories			
NHSN Code	**Operative Procedure**	**Description**	**ICD-9-CM Codes**
AAA	Abdominal aortic aneurysm repair	Resection of abdominal aorta with anastomosis or replacement	38.34, 38.44, 38.64
AMP	Limb amputation	Total or partial amputation or disarticulation of the upper or lower limbs, including digits	84.00-84.19, 84.91
APPY	Appendix surgery	Operation of appendix (not incidental to another procedure)	47.01, 47.09, 47.2, 47.91-47.92, 47.99
AVSD	Shunt for dialysis	Arteriovenostomy for renal dialysis	39.27
BILI	Bile duct, liver or pancreatic surgery	Excision of bile ducts or operative procedures on the biliary tract, liver or pancreas (does not include operations only on gallbladder)	50.0, 50.12, 50.14, 50.21-50.23, 50.25-50.26, 50.29-50.3, 50.4, 50.61, 50.69, 51.31-51.37, 51.39, 51.41-51.43, 51.49, 51.51, 51.59, 51.61-51.63, 51.69, 51.71-51.72, 51.79, 51.81-51.83, 51.89, 51.91-51.95, 51.99, 52.09, 52.12, 52.22, 52.3, 52.4, 52.51-52.53, 52.59-52.6, 52.7, 52.92, 52.95-52.96, 52.99
BRST	Breast surgery	Excision of lesion or tissue of breast including radical, modified, or quadrant resection, lumpectomy, incisional biopsy, or mammoplasty.	85.12, 85.20-85.23, 85.31-85.36, 85.41-85.48, 85.50, 85.53-85.54, 85.6, 85.70-85.76, 85.79, 85.93-85.96
CARD	Cardiac surgery	Open chest procedures on the valves or septum of heart; does not include coronary artery bypass graft, surgery on vessels, heart transplantation, or pacemaker implantation	35.00-35.04, 35.10-35.14, 35.20-35.28, 35.31-35.35, 35.39, 35.42, 35.50-35.51, 35.53-35.54, 35.60-35.63, 35.70-35.73, 35.81-35.84, 35.91-35.95, 35.98-35.99, 37.10-37.11, 37.24-37.25, 37.31-37.33, 37.35-37.36, 37.41, 37.49, 37.60*
CEA	Carotid endarterectomy	Carotid endarterectomy	38.12
CBGB	Coronary artery bypass graft with **both** chest and donor site incisions	Chest procedure to perform direct revascularization of the heart; includes obtaining suitable vein from donor site for grafting.	36.10-36.14, 36.19
CBGC	Coronary artery bypass graft with chest incision only	Chest procedure to perform direct vascularization of the heart using, for example the internal mammary (thoracic) artery	36.15-36.17, 36.2

Table 1. NHSN Operative Procedure Categories			
NHSN Code	**Operative Procedure**	**Description**	**ICD-9-CM Codes**
CHOL	Gallbladder surgery	Cholecystectomy and cholecystotomy	51.03-51.04, 51.13, 51.21-51.24
COLO	Colon surgery	Incision, resection, or anastomosis of the large intestine; includes large-to-small and small-to-large bowel anastomosis; does not include rectal operations	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
CRAN	Craniotomy	Incision through the skull to excise, repair, or explore the brain; does not include taps or punctures	01.12, 01.14, 01.21-01.25, 01.28, 01.31-01.32, 01.39, 01.41-01.42, 01.51-01.53, 01.59, 02.11-02.14, 02.91-02.93, 07.51-07.54, 07.59, 07.61-07.65, 07.68-07.69, 07.71-07.72, 07.79, 38.01, 38.11, 38.31, 38.41, 38.51, 38.61, 38.81, 39.28
CSEC	Cesarean section	Obstetrical delivery by Cesarean section	74.0, 74.1, 74.2, 74.4, 74.91, 74.99
FUSN	Spinal fusion	Immobilization of spinal column	81.00-81.08, 81.62-81.64, 84.51
FX	Open reduction of fracture	Open reduction of fracture or dislocation of long bones that requires internal or external fixation; does not include placement of joint prosthesis	79.21-79.22, 79.25-79.26, 79.31-79.32, 79.35-79.36, 79.51-79.52, 79.55-79.56
GAST	Gastric surgery	Incision or excision of stomach; includes subtotal or total gastrectomy; does not include vagotomy and fundoplication	43.0, 43.42, 43.49-43.5, 43.6, 43.7, 43.81, 43.89, 43.91, 43.99, 44.15, 44.21, 44.29, 44.31, 44.38-44.42, 44.49-44.5, 44.61-44.65, 44.68-44.69, 44.95-44.98
HER	Herniorrhaphy	Repair of inguinal, femoral, umbilical, or anterior abdominal wall hernia; does not include repair of diaphragmatic or hiatal hernia or hernias at other body sites.	17.11-17.13, 17.21-17.24, 53.00-53.05, 53.10-53.17, 53.21, 53.29, 53.31, 53.39, 53.41-53.43, 53.49, 53.51, 53.59, 53.61-53.63, 53.69
HPRO	Hip prosthesis	Arthroplasty of hip	00.70-00.73, 00.85-00.87, 81.51-81.53
HTP	Heart transplant	Transplantation of heart; in/explantation of artificial heart	37.51-37.55
HYST	Abdominal hysterectomy	Removal of uterus through an abdominal incision	68.31, 68.39, 68.41, 68.49, 68.61, 68.69

Table 1. NHSN Operative Procedure Categories			
NHSN Code	**Operative Procedure**	**Description**	**ICD-9-CM Codes**
KPRO	Knee prosthesis	Arthroplasty of knee	00.80-00.84, 81.54-81.55
KTP	Kidney transplant	Transplantation of kidney	55.61, 55.69
LAM	Laminectomy	Exploration or decompression of spinal cord through excision or incision into vertebral structures	03.01-03.02, 03.09, 80.50-80.51, 80.53-80.54+, 80.59, 84.60-84.69, 84.80 – 84.85
LTP	Liver transplant	Transplantation of liver	50.51, 50.59
NECK	Neck surgery	Major excision or incision of the larynx and radical neck dissection; does not include thyroid and parathyroid operations.	30.1, 30.21-30.22, 30.29-30.3, 30.4, 31.45, 40.40-40.42
NEPH	Kidney surgery	Resection or manipulation of the kidney with or without removal of related structures	55.01-55.02, 55.11-55.12, 55.24, 55.31-55.32, 55.34-55.35, 55.39-55.4, 55.51-55.52, 55.54, 55.91
OVRY	Ovarian surgery	Operations on ovary and related structures	65.01, 65.09, 65.12-65.13, 65.21-65.25, 65.29, 65.31, 65.39, 65.41, 65.49, 65.51-65.54, 65.61-65.64, 65.71-65.76, 65.79, 65.81, 65.89, 65.92-65.95, 65.99
PACE	Pacemaker surgery	Insertion, manipulation or replacement of pacemaker	00.50-00.54, 37.70-37.77, 37.79-37.83, 37.85-37.87, 37.89, 37.94-37.99
PRST	Prostate surgery	Suprapubic, retropubic, radical, or perineal excision of the prostate; does not include transurethral resection of the prostate.	60.12, 60.3, 60.4, 60.5, 60.61-60.62, 60.69
PVBY	Peripheral vascular bypass surgery	Bypass operations on peripheral vessels	39.29
REC	Rectal surgery	Operations on rectum	48.25, 48.35, 48.40, 48.42-48.43, 48.49-48.50-48.52, 48.59, 48.61-48.65, 48.69, 48.74
RFUSN	Refusion of spine	Refusion of spine	81.30-81.39
SB	Small bowel surgery	Incision or resection of the small intestine; does not include small-to-large bowel anastomosis	45.01-45.02, 45.15, 45.31-45.34, 45.51, 45.61-45.63, 45.91, 46.01-46.02, 46.20-46.24, 46.31, 46.39, 46.41, 46.51, 46.71-46.74, 46.93

Table 1. NHSN Operative Procedure Categories			
NHSN Code	**Operative Procedure**	**Description**	**ICD-9-CM Codes**
SPLE	Spleen surgery	Resection or manipulation of spleen	41.2, 41.33, 41.41-41.43, 41.5, 41.93, 41.95, 41.99
THOR	Thoracic surgery	Noncardiac, nonvascular thoracic surgery; includes pneumonectomy and diaphragmatic or hiatal hernia repair	32.09-32.1, 32.20,32.21-32.23, 32.25-32.26, 32.29-32.30, 32.39, 32.4, 32.41, 32.49, 32.50,32.59, 32.6, , 32.9, 33.0, 33.1,33.20, 33.28, 33.31-33.34, 33.39, 33.41-33.43, 33.48-33.49, 33.98-33.99, 34.01-34.03, 34.06, 34.1, 34.20, 34.26, 34.3, 34.4, 34.51 - 34.52, 34.59-34.6, 34.81-34.84, 34.89, 34.93, 34.99, 53.71-53.72, 53.75, 53.80-53.84
THYR	Thyroid and/or parathyroid surgery	Resection or manipulation of thyroid and/or parathyroid	06.02, 06.09, 06.12, 06.2, 06.31, 06.39-06.4, 06.50-06.52, 06.6, 06.7, 06.81, 06.89, 06.91-06.95, 06.98-06.99
VHYS	Vaginal hysterectomy	Removal of the uterus through vaginal or perineal incision	68.51, 68.59, 68.7-68.71, 68.79
VSHN	Ventricular shunt	Ventricular shunt operations, including revision and removal of shunt	02.2, 02.31-02.35, 02.39, 02.42-02.43, 54.95
XLAP	Abdominal surgery	Abdominal operations not involving the gastrointestinal tract or biliary system	53.7, 54.0, 54.11-54.12, 54.19, 54.3, 54.4, 54.51, 54.59, 54.61-54.64, 54.71-54.75, 54.92-54.93

*NOTE: If the incision is not entirely closed at procedure's end (i.e., if wires or tubes extrude through the incision) then the procedure does not meet the criteria of an NHSN operative procedure.

Definitions:

An NHSN operative procedure is a procedure

1) that is performed on a patient who is an NHSN inpatient or an NHSN outpatient; and
2) takes place during an operation (defined as a single trip to the operating room (OR) where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the OR; and

3) that is included in Table 1.

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

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

OR: A patient care area that meets the American Institute of Architects (AIA) criteria for an operating room[7]. This may include an operating room, C-Section room, interventional radiology room, or a cardiac catheterization lab.

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

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

REPORTING INSTRUCTIONS:

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

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

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

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

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

1. Superficial Incisional Primary (SIP) – a superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB)
2. Superficial Incisional Secondary (SIS) – a superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site [leg] incision for CBGB)

REPORTING INSTRUCTIONS:

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

A **deep incisional SSI** must meet on of the following criteria:
Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure
and
involves deep soft tissues (e.g., fascial and muscle layers) of the incision
and
patient has at least one of the following:

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

d. diagnosis of a deep incisional SSI by a surgeon or attending physician.

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

1. Deep Incisional Primary (DIP) – a deep incisional SSI that is identified in a primary incision in a patient that has had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB)
2. Deep Incisional Secondary (DIS) – a deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site [leg] incision for CBGB)

REPORTING INSTRUCTIONS:

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

An **organ/space SSI** involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure. Specific sites are assigned to organ/space SSI to further identify the location of the infection. The table below lists the specific sites that must be used to differentiate organ/space SSI. An example is appendectomy with subsequent subdiaphragmatic abscess, which would be reported as an organ/space SSI at the intraabdominal specific site (SSI-IAB). Specific sites of organ/space (Table 2) have specific criteria which must be met in order to qualify as an NHSN event. These criteria are in addition to the general criteria for and can be found **in** Chapter 17.[8]

An **organ/space SSI** must meet one of the following criteria:
Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure
and
infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure
and
patient has at least one of the following:

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.

REPORTING INSTRUCTIONS:

- Occasionally an organ/space infection drains through the incision. Such infection generally does not involve reoperation and is considered a complication of the incision. Therefore, classify it as a deep incisional SSI.
- Report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as SSI-MED rather than SSI-BONE.
- If meningitis (MEN) and a brain abscess (IC) are present together after operation, report as SSI-IC.
- Report CSF shunt infection as SSI-MEN if it occurs ≤ 1 year of placement; if later or after manipulation/access, it is considered CNS-MEN and is not reportable under this manual.
- Report spinal abscess with meningitis as SSI-MEN following spinal surgery
- Episiotomy is not considered an operative procedure in NHSN.

Table 2. Specific sites of an organ/space SSI. Criteria for these sites can be found in the NHSN Help Messages (must be logged in to NHSN) orChapter 17.[8]

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

Numerator Data: All patients having a selected operation are monitored for signs of SSI. The *Surgical Site Infection (SSI)* form (CDC 57.120) is completed for each such patient found to have an SSI.

NOTES:

1. If a patient has several NHSN operative procedures prior to an infection, report the operative procedure code of the operation that was performed most closely in time prior to the infection date, unless there is evidence that the infection is associated with a different operation.

2. If more than one NHSN operative procedure was done through a single incision, attempt to determine the procedure that is thought to be associated with the infection. If it is not clear (as is often the case when the infection is a superficial incisional SSI), or if the infection site being reported is not an SSI, use the NHSN Principal Operative Procedure Selection Lists (Table 3) to select which operative procedure to report.

Table 3. NHSN Principal Operative Procedure Selection Lists

The following lists are derived from Table 1, NHSN Operative Procedure Categories. The operative procedures with the highest risk of surgical site infection are listed before those with a lower risk.		
Priority	**Code**	**Abdominal Operations**
1	SB	Small bowel surgery
2	KTP	Kidney transplant
3	LTP	Liver transplant
4	BILI	Bile duct, liver or pancreatic surgery
5	REC	Rectal surgery
6	COLO	Colon surgery
7	GAST	Gastric surgery
8	CSEC	Cesarean section
9	SPLE	Spleen surgery
10	APPY	Appendix surgery
11	HYST	Abdominal hysterectomy
12	OVRY	Ovarian surgery
13	HER	Herniorrhaphy
14	CHOL	Gall bladder surgery
15	AAA	Abdominal aortic aneurysm repair
16	NEPH	Kidney surgery
17	XLAP	Laparotomy
Priority	**Code**	**Thoracic Operations**
1	HTP	Heart transplant
2	CBGB	Coronary artery bypass graft with donor incision(s)
3	CBGC	Coronary artery bypass graft, chest incision only
4	CARD	Cardiac surgery
5	THOR	Thoracic surgery
Priority	**Code**	**Neurosurgical (Spine) Operations**
1	RFUSN	Refusion of spine
2	FUSN	Spinal fusion
3	LAM	Laminectomy
Priority	**Code**	**Neurosurgical (Brain) Operations**

1	VSHN	Ventricular shunt
2	CRAN	Craniotomy
Priority	**Code**	**Neck Operations**
1	NECK	Neck surgery
2	THYR	Thyroid and or parathyroid surgery

The *Instructions for Completion of Surgical Site Infection* form (Tables of Instructions, Tables 12 and 2a) includes brief instructions for collection and entry of each data element on the form. The SSI form includes patient demographic information and information about the operative procedure, including the date and type of procedure. Information about the SSI includes the date of SSI, specific criteria met for identifying the SSI, when the SSI was detected, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and the organisms' antimicrobial susceptibilities.

Denominator Data: For all patients having a procedure selected for surveillance during the month, complete the *Denominator for Procedure* form (CDC 57.121). The data are collected individually for each operative procedure performed during the month specified on the *Patient Safety Monthly Surveillance Plan* (CDC 57.106). The *Instructions for Completion of Denominator for Procedure* form (Tables of Instructions, Table 13) includes brief instructions for collection and entry of each data element on the form.

NOTES:

1. If more than one NHSN operative procedure is performed during the same trip to the OR, a Denominator for Procedure (CDC 57.121) record is reported for each operative procedure being monitored. Even if more than one NHSN operative procedure is done through the same incision (e.g., CARD and CBGC), a *Denominator for Procedure* record is reported for each.
2. If more than one NHSN operative procedure is performed through the same incision, record the combined duration of all procedures, which is the time from skin incision to primary closure.
3. If a patient had a coronary artery bypass graft with a chest incision and a donor site incision it is a CBGB. The CBGC is only used when there is only a chest incision. CBGB and CBGC are never reported for the same patient for the same trip to the OR.
4. For bilateral operative procedures (e.g., KPRO), two separate Denominator for Procedure (CDC 57.121) are completed. To document the duration of the procedure, indicate the incision time to closure time for each procedure separately or, alternatively, take the total time for both procedures and split it evenly between the two.
5. If a patient goes to the OR more than once during the same admission and another procedure is performed through the same incision within 24 hours of the original operative incision, report only one procedure on the Denominator for Procedure

(CDC 57.121) combining the durations for both procedures. For example, a patient has a CBGB lasting 4 hours. He returns to the OR six hours later to correct a bleeding vessel. The surgeon reopens the initial incision, makes the repairs, and recloses in 1.5 hours. Record the operative procedure as one CBGB and the duration of operation as 5 hour 30 minutes. If the wound class has changed, report the higher wound class. If the ASA class has changed, report the higher ASA class.

Data Analyses: The SSI rates per 100 operative procedures are calculated by dividing the number of SSIs by the number of specific operative procedures and multiplying the results by 100. These calculations will be performed separately for the different types of operative procedures and stratified by risk index. Standardized infection ratios are also calculated using indirect standardization or multivariate models.

- Basic SSI Risk Index. The index used in NHSN assigns surgical patients into categories based on the presence of three major risk factors:

  1. Operation lasting more than the duration cut point hours, where the duration cut point is the approximate 75th percentile of the duration of surgery in minutes for the operative procedure.
  2. Contaminated (Class 3) or Dirty/infected (Class 4) wound class.
  3. ASA classification of 3, 4, or 5.

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

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Post-Procedure Pneumonia (PPP) Event

Introduction: Patients who undergo thoraco-abdominal operations are at increased risk of acquiring healthcare-associated pneumonia, even in the absence of mechanical ventilation.[1,2,3] Based on NNIS system reports, pneumonia was the third most frequently reported healthcare-associated infection among hospitalized surgical patients (15%), and among thoracic surgery patients, 34% of the healthcare-associated infections reported were pneumonia. Further, when NNIS surgical patients with healthcare-associated infections died and the death was attributed to the infection, pneumonia was the most frequently associated infection (38%). In this group, the risk of surgical patient death due to healthcare-associated pneumonia was similar whether or not a mechanical ventilator was used.[4] Prevention of postoperative pneumonia includes ambulation and deep breathing as soon as possible after operation and, in some patients, the use of incentive spirometry.

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

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

Definitions: Pneumonia (PNEU) is identified by using a combination of radiologic, clinical, and laboratory criteria (see definitions section under VAP event [Chapter 6]).
Post-procedure pneumonia: A pneumonia that meets the criteria after an inpatient operation takes place.

REPORTING INSTRUCTIONS:

- Report as PPP those pneumonias that are detected prior to discharge following inpatient operations.
- Do not report PPP following outpatient operations.

Numerator Data: All inpatients having the selected procedure are monitored for signs of PPP. The *Pneumonia (PNEU)* form (CDC 57.111) is completed for each such patient found to have a PPP. The *Instructions for Completion of Pneumonia Form* (Tables of Instructions, Tables 4 and 2a) includes brief instructions for collection and entry of each data element on the form. The *PNEU* form includes patient demographic information and information about the operative procedure, including the date and type of procedure. Additional data include the specific criteria met for identifying the PNEU, whether the PNEU was also associated with the use of a ventilator, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and the organisms' antimicrobial susceptibilities.

Denominator Data: For all patients having a procedure selected for surveillance during the month, complete a *Denominator for Procedure form* (CDC 57.121). The data are collected individually for each inpatient operative procedure performed during the month specified on the *Patient Safety Monthly Surveillance Plan* (CDC 57.106). The *Instructions for Completion of Denominator for Procedure* (Tables of Instructions, Table 13) includes brief instructions for collection and entry of each data element on the form.
Data Analyses: The PPP rates per 100 operative procedures are calculated by dividing the number of PPPs by the number of specific operative procedures and multiplying the results by 100. These calculations will be performed separately for the different types of operative procedures.

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Antimicrobial Use and Resistance (AUR) Option

Introduction: Rates of resistance to antimicrobials agents are increasing rapidly at U.S. hospitals. The two main reasons for this increase are patient-to-patient transmission of resistant organisms and selection of resistant organisms because of antimicrobial receipt.[1] Previous studies have shown that feedback of rates of antimicrobial use and resistance to clinicians can improve the appropriateness of antimicrobial prescription. Use of the AUR Option will assist hospitals in collecting data on antimicrobial resistance and/or antimicrobial use so that this information can be used for prevention purposes. The AUR Option does not collect data on healthcare-associated infections. Therefore, we strongly encourage the simultaneous collection of data using the Device-Associated Event Module for the same months and in the same locations as followed in the AUR Option.

Settings: All data are collected for all three of the following: 1) at least one intensive care unit or specialty care area (ICU/SCA exclusive of pediatric locations), 2) all non-ICU/SCA areas combined, and 3) all outpatient areas combined.
EXCEPTION: No pharmacy data are collected on outpatient areas.

Requirements: If the AUR Option is chosen, either or both microbiology laboratory and pharmacy data may be reported for the locations specified below in item 2 for a minimum of 6 months per calendar year (*Antimicrobial Use and Resistance (AUR) Microbiology - Laboratory Data* (CDC 57.123) and *Antimicrobial Use and Resistance (AUR) - Pharmacy Data* (CDC 57.124)). Submission of fewer than 6 months will not be adequate to accurately measure antimicrobial resistance or use rates. If more than one ICU/SCA is followed, at least 6 months of data for each ICU/SCA, in addition to the data from the combined inpatient non-ICU/SCA areas and combined outpatient areas, must be reported.

1. The unit of data collection is one month.
2. An acceptable month of data includes:
    a. Data submitted for all three of the following hospital areas: 1) at least one ICU/SCA, 2) all non-ICU/SCA inpatient areas combined, and 3) all outpatient areas combined.
    b. Each month, each hospital chooses to monitor either microbiology data or pharmacy data or both and indicates its choice on the *Patient Safety Monthly Reporting Plan* (CDC 57.106)
    c. All data fields on the selected AUR Monthly Report forms are completed for each hospital area being followed.

The *Instructions for Completion of AUR Option (Microbiology and Pharmacy)* (Tables of Instructions, Table 11) includes brief instructions on how to complete all data fields on the selected AUR Monthly Report forms for each hospital area being followed.

Definitions: See *Instructions for Completion of AUR Option (Microbiology and Pharmacy)* (Table of Instructions, Table 11).

Numerator Data:

Microbiology: Antimicrobial susceptibility test results on all nonduplicate, clinical isolates processed by the laboratory during each study month are reported. Susceptible (S), intermediate (I), and resistant (R) isolates are stratified by ICU/SCA, combined non-ICU inpatient areas, and combined outpatient areas. All nonduplicate isolates, whether responsible for hospital-associated or community-associated infection or for colonization, are reported by participating hospitals, with the exception of surveillance cultures. Participating hospitals must use Clinical Laboratory Standards Institute (CLSI) (formerly National Committee for Clinical Laboratory Standards [NCCLS]) interpretive standards for minimum inhibitory concentration or zone diameter testing standards to report numbers of susceptible, intermediate, or resistant organisms. Antimicrobial resistance rates are calculated by using the number of resistant isolates as the numerator.

Pharmacy: The number of grams or million international units (mill. I. U.), as appropriate, are reported monthly for inpatients for selected oral and parenteral antimicrobial agents. These amounts are converted to defined daily doses (DDD) for each antimicrobial agent by dividing the amount used in the inpatient location by the appropriate DDD conversion value (Table 1).[2] Antimicrobial use rates are calculated by using the number of DDD of antimicrobial agent as the numerator (see Data Analysis below for rate formula).

Table 1. Defined daily dose (DDD) of antimicrobial agents, by class and group

Class	Group	Antimicrobial Agent	DDD
β-lactams	Penicillin group	Penicillin G	1.2×10^6 U*
		Procaine Penicillin G	2.4×10^6 U*
		Penicillin G benzathine	1.2×10^6 U*
		Penicillin V	1 g*
	Ampicillin group	Ampicillin (parenteral)	2g
		Ampicillin (oral)	2g
		Ampicillin/sulbactam	2g
		Amoxicillin (oral)	1g
		Amoxicillin/Clavulanic Acid (oral)	1g
	Antistaphylococcal penicillins (Methicillin group)	Nafcillin	4g*
		Oxacillin	2g
		Dicloxacillin (oral)	2g
	Antipseudomonal penicillins	Piperacillin	14g
		Piperacillin/Tazobactam	14g
		Ticarcillin	15g
		Ticarcillin/Clavulanic Acid	15g
	1st-Generation cephalosporins	Cefazolin	3g
		Cephalothin	4g
		Cefadroxil (oral)	2g

		Cephalexin (oral)	2g
	2nd-Generation cephalosporins	Cefotetan	4g
		Cefmetazole	4g*
		Cefoxitin	6g
		Cefuroxime	3g
		Cefuroxime axetil (oral)	1g*
		Cefaclor (oral)	1g
		Cefprozil (oral)	1g
	3rd-Generation cephalosporins	Cefotaxime	4g
		Ceftazidime	4g
		Ceftizoxime	4g
		Ceftriaxone	2g
		Cefixime (oral)	0.4g
		Cefipime	2g
	Carbapenems	Meropenem	2g
		Imipenem cilastatin	2g
Other β-lactams		Aztreonam	4g
Glycopeptides		Vancomycin (parenteral)	2g
		Vancomycin (oral)	1g*
Fluoroquinolones		Ciprofloxacin (parenteral)	0.5g
		Ciprofloxacin (oral)	1g
		Ofloxacin (parenteral)	0.4g
		Ofloxacin (oral)	0.4g
		Levofloxacin (parenteral)	0.5g
		Levofloxacin (oral)	0.5g
		Trovafloxacin (parenteral)	0.2g
		Trovafloxacin (oral)	0.2g
		Sparfloxacin (oral)	0.2g
		Norfloxacin (oral)	0.8g
		Moxifloxacin (oral)	0.4 g
		Moxifloxacin (Parenteral)	0.4 g
		Lomefloxacin	0.4g*
Trimethoprim/ Sulfamethoxazole		Trimethoprim component (oral)	0.4g
		Trimethoprim compound (parenteral)	0.4g
Tetracyclines		Tigecycline (Parenteral)	0.1g

DDD for those agents marked with an asterisk (*) are adapted from Amsden GW, Schentag JJ. Tables of antimicrobial agent pharmacology. In: Mandell GL,Bennett JE, Dolin R, eds. Principles and practice of infectious diseases, 4th edition. New York: Churchill Livingstone, 1995:492-528.
All other DDD are from: Anatomical Therapeutic Chemical (ATC) classification index with defined daily doses (DDD). WHO Collaborating Centre for Drug Statistics Methodology, 2007; http://www.whocc.no/atcddd/

Denominator Data: Antimicrobial resistance rates are calculated by using the number of tested isolates as the denominator. Antimicrobial use rate denominators are patient-days per time period of analysis stratified by area of utilization. If a screening test is used to eliminate susceptible isolates for further testing to a specific antimicrobial, the total number of isolates screened or tested should be used in the denominator.

Data Analyses: Antimicrobial resistance data are expressed as prevalence resistance rates per 100 isolates tested (i.e., # resistant isolates / # isolates tested x 100).

Antimicrobial use data are expressed as incidence density rates of DDD per 1000 patient-days stratified by hospital area according to the formula below. Antimicrobials with similar spectrum or clinical indications are grouped prior to analysis.

$$\text{DDD per 1,000 patient-days} = \frac{\text{DDD of antimicrobial}}{\text{\# Patient-days}} \times 1000$$

[1] Schwartz MN. Use of antimicrobial agents and drug resistance. N Eng J Med 1997;337:491-2.

[2] WHO Collaborating Centre for Drug Statistics Methodology. Anatomical Therapeutic Chemical (ATC) classification index with defined daily doses (DDD). 2007. Available from: http://www.whocc.no/atcddd/

Multidrug-Resistant Organism & *Clostridium difficile*-Associated Disease (MDRO/CDAD) Module

Background: Methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* spp. (VRE) and certain gram-negative bacilli have increased in prevalence in U.S. hospitals over the last three decades, and have important implications for patient safety. A primary reason for concern about these multidrug-resistant organisms (MDROs) is that options for treating patients with these infections are often extremely limited, and MDRO infections are associated with increased lengths of stay, costs, and mortality. Many of these traits have also been observed for *Clostridium difficile*-associated disease (CDAD). Recently, the Healthcare Infection Control Practices Advisory Committee (HICPAC) approved guidelines for the control of MDROs.[1] These are available at (http://www.cdc.gov/ncidod/dhqp/pdf/ar/mdroGuideline2006.pdf). The MDRO and CDAD module of the NHSN can provide a tool to assist facilities in meeting some of the criteria outlined in the guidelines. In addition, many of the metrics used in this module are consistent with "Recommendations for Metrics for Multidrug-Resistant Organisms in Healthcare Settings: SHEA/HICPAC Position Paper".[2]

Clostridium difficile is responsible for a spectrum of *C. difficile* infections (CDI) [originally referred to as *C. difficile*-associated disease or CDAD], including uncomplicated diarrhea, pseudomembranous colitis, and toxic megacolon which can, in some instances, lead to sepsis and even death. Current CDC definitions for healthcare-associated infections, while adequate for the site of infection, do not take into account the special characteristics of disease caused by *C. difficile*. Although CDI represents a subset of gastroenteritis and gastrointestinal tract infections, specific standard definitions for CDI [3] should be incorporated to obtain a more complete understanding of how *C. difficile* is being transmitted in a healthcare facility. Please note that the term CDI is replacing CDAD. Both terms represent the same illness and are used interchangeably as we transition this module to the newer terminology.

As outlined in the HICPAC guideline[1], these pathogens may require specialized monitoring to evaluate if intensified infection control efforts are required to reduce the occurrence of these organisms and related infections. The goal of this module is to provide a mechanism for facilities to report and analyze these data that will inform infection control staff of the impact of targeted prevention efforts. This module contains two options, one focused on MDROs and the second on CDAD or CDI. Reporting options are summarized in Table 1, below.

Table 1. Required and Optional Reporting Choices for MDRO and CDAD Module

Reporting Choices	**MRSA or MRSA/MSSA**	**VRE**	***Klebsiella* spp.**	***Acinetobacter* spp.**	***C. difficile***
Required	**Method**	**Method**	**Method**	**Method**	**Method**
Infection Surveillance (*Location Specific for ≥ 3 months) Choose ≥ 1 organism	A, B	A, B	A, B	A, B	±A, B
OR					

Proxy Infection Measures [§]Laboratory-Identified (LabID) Event (*Location Specific for ≥ 3 consecutive months) Choose ≥ 1 organism	A, B, C	A, B, C	B,C	B,C	[±]A, B, C
Optional	**Method**	**Method**	**Method**	**Method**	**Method**
Prevention Process Measures Options: Hand Hygiene Adherence Gown and Gloves Use Adherence Active Surveillance Testing (AST) Adherence	 B B B	 B B B	 B B N/A	 B B N/A	 B B N/A
AST Outcome Measures Incident and Prevalent Cases using AST	B	B	N/A	N/A	N/A

*Location: Patient care area selected for monitoring and reported in Monthly Reporting Plan.
N/A – not available or contraindicated

[±]No surveillance for CDI will be performed in Neonatal Intensive Care Units (NICU).

[§] LabID Events can be reported Overall facility-wide, in addition to Facility-wide by location or by Selected locations.

Method (minimum requirement is 3 months for Infection Surveillance or 3 consecutive months for LabID Event reporting using one of the methods below):
A – Facility-wide by location. Requires the most effort but provides the most detail for local and national statistical data.
B – Selected locations within the facility (1 or more). Acceptable method, ideal for use during targeted prevention programs.
C – Overall facility-wide. Acceptable method, ideal for CDI or MDRO infrequently encountered, or smaller hospitals.

I. MDRO Option

Methodology: Facilities may choose to monitor one or more of the following MDROs: MRSA, MRSA and MSSA, VRE, multidrug-resistant *Klebsiella* spp., and multidrug-resistant *Acinetobacter* spp. (See definitions in Section A, Option 1). For *S. aureus*, both the resistant (MRSA) and the susceptible (MSSA) phenotypes can be tracked to provide concurrent measures of the susceptible pathogens as a comparison to those of the resistant pathogens in a setting of active prevention efforts targeted at the resistant pathogen. There are 2 options for required reporting and 2 additional optional monitoring methods (see Table 1):

Required Reporting Options:

- MDRO infection surveillance, i.e., for each patient care area selected, surveillance for all NHSN-defined healthcare-associated infections caused by at least one MDRO.
  OR
- Reporting of proxy infection measures of MDRO healthcare acquisition, exposure burden, and infection burden by using primarily laboratory data. Laboratory testing results can be used without clinical evaluation of the patient, allowing for a much less labor-intensive means to track MDROs. These can be monitored facility-wide (Method C) or for specific locations (Method A or B with unique denominator data), allowing for both location-specific and facility-wide measures.

Additional Optional Reporting Methods:

- Prevention process measures that allow facilities to systematically collect data on hand hygiene and gown and gloves use adherence, and for those conducting active surveillance testing (AST), adherence to obtaining AST.
- AST outcome measures that can be reported if AST is performed, providing incidence and prevalence rates for selected MDROs.

The data collections in the MDRO Option will enable participating facilities and CDC to calculate several measures, depending on which reporting methods the facility chooses to follow (see Table 2 at the end of this chapter). NHSN forms should be used to collect all required data, using the definitions of each data field as outlined in this protocol and in the "Instructions for Completion of MDRO/CDAD Forms". When denominator data are available from electronic databases, these sources may be used as long as the counts are not substantially different (+ or – 5%) from manually collected counts.

Active, patient-based, prospective surveillance of the chosen MDRO infections by a trained infection preventionist (IP) is required for MDRO infection surveillance. This means that the IP shall seek to confirm and classify infections caused by the MDRO(s) chosen for monitoring during a patient's stay in at least one patient care location during the surveillance period. Some process measures require direct observation as described in Section IB. Personnel other than the IP may be trained to perform these observations and collect the required data elements.

A. Required Reporting

Option 1. MDRO Infection Surveillance – (MRSA, MRSA/MSSA, VRE, *Klebsiella* spp., *Acinetobacter* spp).

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas (includes hematology/oncology wards, bone marrow transplant units, inpatient dialysis units, solid organ transplant units, long term acute care areas), (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (e.g., surgical wards).

Requirements: Surveillance for all types of NHSN-defined healthcare-associated infections (HAIs) of the MDRO selected for monitoring in at least one location in the healthcare facility for at least 3 months in a calendar year as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: MDROs included in this module are defined below. Refer to Chepter 17 for infection site criteria. Refer to Chapter 16 Key Terms for assistance with variable definitions.

MRSA: Includes ***S. aureus*** cultured from any specimen that tests oxacillin-resistant by standard susceptibility testing methods, or by a positive result from molecular testing for mecA and PBP2a; these methods may also include positive results of specimens tested by any other FDA approved PCR test for MRSA.
MSSA: ***S. aureus*** cultured from any specimen testing as oxacillin-intermediate or -susceptible by standard susceptibility testing methods, or by a negative result from molecular testing for mecA and PBP2a.
VRE: Any ***Enterococcus* spp.** (regardless of whether identified to the species level), that is resistant to vancomycin.
MDR-*Klebsiella*: ***Klebsiella* spp**. testing non-susceptible (i.e., resistant or intermediate) to ceftazidime or ceftriaxone.
MDR-*Acinetobacter*: ***Acinetobacter*** spp. testing resistant to all agents (for which testing was done) in at least 3 antimicrobial classes including β-lactams, aminoglycosides, carbapenems, and fluoroquinolones.

β-lactams	Aminoglycosides	Carbapenems	Fluoroquinolones
Ampicillin/sulbactam Piperacillin/tazobactam Cefepime Ceftazidime	Amikacin Gentamicin Tobramycin	Imipenem Meropenem	Ciprofloxacin Levofloxacin

Numerator Data: Number of infections, by MDRO type. Infections are reported on the appropriate NHSN forms: *Primary Bloodstream Infection, Pneumonia, Urinary Tract Infection, Surgical Site Infection, or MDRO or CDAD Infection Event (CDC 57.108, 57.111, 57.114, 57.120, and 57.126, respectively.) (See Tables of Instructions, Tables 2, 2a, 4, 5, 12, and 20, respectively, for completion instructions.)*

Denominator Data: Number of patient days. Patient Days are reported using the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (CDC 57.127). (See Tables of Instructions Table 21 for completion instructions.)

Data Analysis: Data are stratified by time (e.g., month, quarter, etc.) and patient care location.
MDRO Infection Incidence Rate = Number of infections by MDRO type/ Number of patient days X 1000

Option 2. Laboratory-Identified (LabID) Event

Introduction: To calculate proxy measures of MDRO infections, exposures, and healthcare acquisition facilities may choose to monitor laboratory-identified MDRO events. This method allows the facility to rely almost exclusively on easily obtained data from the clinical microbiology laboratory. However, some data elements, such as date admitted to the patient care location and facility may require other data sources.

Laboratory and admission data elements can be used to calculate four distinct proxy measures including: admission prevalence rate and overall prevalence rate based on clinical testing (measures of exposure burden), MDRO bloodstream infection incidence rate (measure of infection burden), and overall MDRO infection/colonization incidence rate (measure of healthcare acquisition). MDRO positive laboratory results can be reported for one or more than one organism. For *S. aureus*, both the resistant (MRSA) and the susceptible (MSSA) phenotypes can be tracked to provide concurrent measures of the susceptible pathogens as a comparison to those of the resistant pathogens in a setting of active prevention efforts targeted at the resistant pathogen.

Settings: Surveillance can occur in any location: inpatient or outpatient (except outpatient dialysis centers).

Requirements: Facilities choose at least 1 of 3 reporting methods: (A) Facility-wide by location: report location-specific data for the entire facility, requiring separate denominator submissions for each location; (B) Selected locations: report location-specific data for only selected locations; and (C) Overall facility-wide: report only one denominator for the entire facility (see protocol Table 1). Facilities must indicate each reporting choice chosen for the calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Facilities can report using Methods A & C, B & C, or A, B, or C (but not A & B). Surveillance for positive laboratory results must be reported for 3 consecutive months to provide meaningful measures.

For each MDRO being monitored, all MDRO test results are evaluated using the algorithm in Figure 1 to determine reportable LabID events for each calendar month, for each facility location as determined by the reporting method chosen. All first MDRO isolates (chronologically) per month are reported as a LabID event for each unique patient regardless of specimen source (excludes tests related to active surveillance testing); if a duplicate MDRO isolate is from blood, it is reported as a LabID event only if it represents a unique blood source (i.e., no prior isolation of the MDRO in blood from the same patient in $\leq$ 2 weeks, even across calendar months) (Figure 1). As a general rule, at a maximum, there should be no more than 2 blood isolates (which would be very rare) reported and 1 first MDRO isolate reported on any patient during a calendar month for each location chosen for reporting. Report a single LabID Event per form.

Definitions:

MDRO Isolate: Any specimen obtained for clinical decision making testing positive for a MDRO (as defined above). (Excludes tests related to active surveillance testing for *S. aureus* or MRSA)

Duplicate MDRO Isolate: Any MDRO isolate from the same patient after an initial isolation of the specific MDRO during a calendar month, regardless of specimen source except unique blood source (Figure 1).

Laboratory-Identified (LabID) Event: All non-duplicate MDRO isolates from any specimen, regardless of specimen source (excludes tests related to active surveillance testing for *S. aureus* or MRSA); and unique blood source MDRO isolates.

MSSA: *S. aureus* cultured from any specimen testing as oxacillin-intermediate or -susceptible by standard susceptibility testing methods, or by a negative result from molecular testing for mecA and PBP2a.

Unique Blood Source: A MDRO isolate from blood in a patient with no prior positive blood culture for the same MDRO in ≤ 2 weeks, even across calendar months (Figure 1).

Numerator Data: Data will be reported using the *Laboratory-identified MDRO or CDAD Event* form (CDC 57.128). (See Tables of Instructions Table 19 for completion instructions.)

Denominator Data: Patient days, admissions, and encounters (for ER and outpatient locations) are reported using the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (CDC 57.127). (See Tables of Instructions Table 21 for completion instructions.)

Data Analysis: Based on data provided on the LabID Event form, each event can be categorized by NHSN to populate different measures. Of note, NHSN will categorize LabID Events as healthcare facility-onset vs. community-onset to ensure that all healthcare facility-onset cases have been hospitalized at least a full 48 hours. Considering: 1) variable times of day that admissions occur and 2) the absence of clinical data to confirm if cultures represent infection incubating at the time of admission, this is operationalized by classifying positive cultures obtained on day 1 (admission date), day 2, and day 3 of admission as community-onset (CO) LabID Events and positive cultures obtained on or after day 4 as healthcare facility-onset (HO) LabID Events.

Categorizing MDRO LabID Events: The following definitions and calculations are built into the analysis capabilities of NHSN and are based on date of admission to the facility and the date the specimen was collected. These are some of the main metrics, but additional calculations will be available in NHSN.

Community-Onset (CO): LabID Event specimen collected as an outpatient or an inpatient ≤ 3 days after admission to the facility (i.e., days 1, 2, or 3 of admission).
Healthcare Facility-Onset (HO): LabID Event specimen collected > 3 days after admission to the facility (i.e., on or after day 4).

Proxy Measures for MDRO Exposure Burden:
Admission Prevalence Rate = Number of 1st LabID Events per patient per month identified ≤ 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100

Location Percent Admission Prevalence that is Community-Onset = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100

Location Percent Admission Prevalence that is Healthcare Facility-Onset = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100

Overall Prevalence Rate = Number of 1st LabID Events per patient per month regardless of time spent in location or facility / Number of patient admissions to the location or facility x 100

Proxy Measures for MDRO Bloodstream Infection:

MDRO Bloodstream Infection Admission Prevalence Rate = Number of all unique blood source LabID Events per patient per month identified ≤ 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100

MDRO Bloodstream Infection Incidence or Incidence Density Rate = Number of all unique blood source LabID Events per patient per month identified > 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100 or Number of patient days for the location or facility x 1,000

Proxy Measures for MDRO Healthcare Acquisition:

Overall MDRO Infection/Colonization Incidence Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type and identified > 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100

Overall MDRO Infection/Colonization Incidence Density Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type and identified > 3 days after admission to the location or facility / Number of patient days for the location or facility x 1,000

B. Optional Reporting

1. Prevention Process Measures Surveillance

a. Monitoring Adherence to Hand Hygiene

Introduction: This option will allow facilities to monitor adherence to hand hygiene after a healthcare worker (HCW) has contact with a patient or inanimate objects in the immediate vicinity of the patient. Research studies have reported data suggesting that improved after-contact hand hygiene is associated with reduced MDRO transmission. While there are multiple opportunities for hand hygiene during patient care, for the purpose of this option, only hand hygiene after contact with a patient or inanimate objects in the immediate vicinity of the patient will be observed and reported. (http://www.cdc.gov/handhygiene/)

Settings: Surveillance will occur in any location: inpatient or outpatient.

Requirements: Surveillance for adherence to hand hygiene in at least one location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Ideally, this should be done in patient care locations also selected for MDRO Infection Surveillance or LabID Event reporting.

In participating patient care locations, perform at least 30 different unannounced observations after contact with patients for as many individual HCWs as possible. For example, try to observe all types of HCWs performing a variety of patient care tasks during the course of the month, not only nurses, or not only during catheter or wound care. No personal identifiers will be collected or reported.

Definitions:

Antiseptic handwash: Washing hands with water and soap or other detergents containing an antiseptic agent.

Antiseptic hand rub: Applying an antiseptic hand-rub product to all surfaces of the hands to reduce the number of microorganisms present.

Hand hygiene: A general term that applies to either: handwashing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis.

Handwashing: Washing hands with plain (i.e., non-antimicrobial) soap and water.

Numerator: Hand Hygiene Performed = Total number of observed contacts during which a HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and appropriate hand hygiene was performed.

Denominator: Hand Hygiene Indicated = Total number of observed contacts during which a HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and therefore, appropriate hand hygiene was indicated.

Hand hygiene process measure data are reported using the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (CDC 57. 127). (See Tables of Instructions Table 21 for completion instructions.)

Data Analysis: Data are stratified by time (e.g., month, quarter, etc.) and patient care location.
Hand Hygiene Percent Adherence = Number of contacts for which hand hygiene was performed / Number of contacts for which hand hygiene was indicated X 100

b. Monitoring Adherence to Gown and Gloves Use as Part of Contact Precautions

Introduction: This option will allow facilities to monitor adherence to gown and gloves use when a HCW has contact with a patient or inanimate objects in the immediate vicinity of the patient, when that patient is on Transmission-based Contact Precautions. While numerous aspects of adherence to Contact Precautions

could be monitored, this surveillance option is only focused on the use of gown and gloves. (http://www.cdc.gov/ncidod/dhqp/gl_isolation_contact.html)

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas (includes hematology/oncology wards, bone marrow transplant units, inpatient dialysis units, solid organ transplant units, long term acute care areas), (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (e.g., surgical wards).

Requirements: Surveillance for adherence to gown and gloves use in at least one location in the healthcare institution for at least 1 calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Ideally, this should be done in patient care locations also selected for MDRO Infection Surveillance or LabID Event reporting.

Among patients on Transmission-based Contact Precautions in participating patient care locations, perform at least 30 unannounced observations. A total of thirty different contacts must be observed monthly among HCWs of varied occupation types. For example, try to observe all types of HCWs performing a variety of patient care tasks during the course of the month, not only nurses, or not only during catheter or wound care. Both gown and gloves must be donned prior to contact for compliance. No personal identifiers will be collected or reported.

Definitions:

Gown and gloves use**:** In the context of Transmission-based Contact Precautions, the donning of both a gown and gloves prior to contact with a patient or inanimate objects in the immediate vicinity of the patient. Both a gown and gloves must be donned prior to contact for compliance.

Gown and Gloves Use:
Numerator: Gown and Gloves Used = Total number of observed contacts between a HCW and a patient or inanimate objects in the immediate vicinity of the patient for which gown and gloves had been donned prior to the contact.

Denominator: Gown and Gloves Indicated = Total number of observed contacts between a HCW and a patient on Transmission-based Contact Precautions or inanimate objects in the immediate vicinity of the patient and therefore, gown and gloves were indicated.

Gown and gloves use process measure data are reported using the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (CDC 57.127). (See Instruction Table 3 for completion instructions.)

Data Analysis: Data are stratified by time (e.g., month, quarter, etc.) and patient care location.
Gown and Glove Use Percent Adherence = Number of contacts for which gown and gloves were used / Number of contacts for which gown and gloves were indicated X 100

c. Monitoring Adherence to Active Surveillance Testing

Introduction: This option will allow facilities to monitor adherence to active surveillance testing (AST) of MRSA and/or VRE, using culturing or other methods.

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas (includes hematology/oncology wards, bone marrow transplant units, inpatient dialysis units, solid organ transplant units, long term acute care areas), (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (e.g., surgical wards).

Requirements: Surveillance of AST adherence in at least one location in the healthcare facility for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). A facility may choose to report AST for MRSA and/or VRE in one or multiple patient care locations, as the facility deems appropriate. Ideally, this should be done in patient care locations also selected for MDRO Infection Surveillance or LabID Event reporting. To improve standardization of applying timing rules relating to when AST specimens are obtained, classify admission specimens as those obtained on day 1 (admission date), day 2, or day 3 (i.e., ≤ 3 days). Classify discharge/transfer AST specimens as those collected on or after day 4 (i.e., > 3 days).

Definitions:
AST Eligible Patients: Choose one of two methods for identifying patients eligible for AST:
All = All patients in the selected patient care area regardless of history of MRSA or VRE infection or colonization.
OR
NHx = All patients in the selected patient care area who have NO documented positive MRSA or VRE infection or colonization during the previous 12 months (as ascertained by either a facility's laboratory records or information provided by referring facilities); and no evidence of MRSA or VRE during stay in the patient care location (i.e., they are not in Contact Precautions).

Timing of AST: Choose one of two methods for reporting the timing of AST:
Adm = Specimens for AST obtained ≤ 3 days after admission,
OR
Both = Specimens for AST obtained ≤ 3 days after admission and, for patients' stays of > 3 days, at the time of discharge/transfer. Discharge/transfer AST should include all discharges (including discharges to other wards or deaths) and can include the most recent weekly AST if performed > 3 days after admission to the patient care location. Discharge/transfer AST should not be performed on patients who tested positive on AST admission.

Numerator and Denominator Data: Use the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (CDC 57.127) to indicate: 1) AST was performed during the month for MRSA and/or VRE, 2) AST-eligible patients, and 3) the timing of AST. No personal identifiers will be collected or reported. (See Tables of Instructions, Table 21 for completion instructions.)

Numerator: For each month during which AST is performed:
Admission AST Performed = Number of patients eligible for admission AST who had a specimen obtained

for testing ≤ 3 days after admission,
AND/OR
Discharge/Transfer AST Performed = For patients' stays > 3 days, the number of discharged or transferred patients eligible for AST who had a specimen obtained for testing prior to discharge, not including the admission AST.

Denominator: For each month during which AST is performed:
Admission AST Eligible = Number of patients eligible for admission AST (All or NHx),
AND/OR
Discharge/Transfer AST Eligible = Number of patients eligible for discharge/transfer AST (All or NHx) AND in the facility location > 3 days AND negative if tested on admission.

Data Analysis: Data are stratified by patient care location and time (e.g., month, quarter, etc.), according to AST-eligible patients monitored and the timing of AST.

Admission AST Percent Adherence = Number of patients with admission AST Performed / Number of patients admission AST eligible X 100

Discharge/transfer AST Percent Adherence = Number of patients with discharge/transfer AST performed / Number of patients discharge/transfer AST eligible X 100

2. Active Surveillance Testing Outcome Measures

Introduction: This option will allow facilities to monitor the prevalent and incident case rates of MRSA and/or VRE colonization or infection. This information will assist facilities in assessing the impact of intervention programs on MRSA or VRE transmission.

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas (includes hematology/oncology wards, bone marrow transplant units, inpatient dialysis units, solid organ transplant units, long term acute care areas), (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (e.g., surgical wards).

Requirements: Surveillance for prevalent and/or incident MRSA or VRE cases in at least one location in the healthcare facility for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). This can be done ONLY in locations where AST adherence is being performed. A minimum AST adherence level will be required for the system to calculate prevalence and incidence. A facility may choose to report AST for MRSA and/or VRE in one or multiple patient care locations, as the facility deems appropriate. Ideally, this should be done in patient care locations also selected for MDRO Infection Surveillance or LabID Event reporting. To improve standardization of applying timing rules relating to when AST specimens are obtained, classify admission specimens as those obtained on day 1 (admission date), day 2, or day 3 (i.e., ≤ 3 days). Classify discharge/transfer AST specimens as those collected on or after day 4 (i.e., > 3 days). Only the first specimen positive for MRSA or VRE from a given patient in the patient care location is counted, whether obtained for AST or as part of clinical care. If an

Admission AST specimen is not collected from an eligible patient, assume the patient has no MRSA or VRE colonization.

Definitions:

AST Admission Prevalent case:

Known Positive = A patient with documentation on admission of MRSA or VRE colonization or infection in the previous 12 months (i.e., patient is known to be colonized or infected as ascertained by either a facility's laboratory records or information provided by referring facilities). (All MRSA or VRE colonized patients currently in the ICU during the first month of surveillance should be considered "Known Positive"),
OR

Admission AST or Clinical Positive = A patient with MRSA or VRE isolated from a specimen collected for AST ≤ 3 days after admission or from clinical specimen obtained ≤ 3 days after admission (i.e., MRSA or VRE cannot be attributed to this patient care location).

AST Incident case: A patient with a stay > 3 days:
With no documentation on admission of MRSA or VRE colonization or infection during the previous 12 months (as ascertained either by the facility's laboratory records or information provided by referring facilities); including admission AST or clinical culture obtained ≤ 3 days after admission (i.e., patient without positive specimen),
AND
With MRSA or VRE isolated from a specimen collected for AST or clinical reasons > 3 days after admission to the patient care location or at the time of discharge/transfer from the patient care location to another location in or outside the facility (including discharges to other wards or deaths).

MRSA colonization: Carriage of MRSA without evidence of infection (e.g., nasal swab test positive for MRSA, without signs or symptoms of infection).

AST Eligible Patients: Choose one of two methods for identifying patients eligible for AST:
All = All patients in the selected patient care area regardless of history of MRSA or VRE infection or colonization,
OR
NHx = All patients in the selected patient care area who have NO documented positive MRSA or VRE infection or colonization during the previous 12 months (as ascertained either by the facility's laboratory records or information provided by referring facilities); and no evidence of MRSA or VRE during stay in the patient care location (i.e., they are not in Contact Precautions).

Timing of AST: Choose one of two methods for reporting the timing of AST:
Adm = Specimens for AST obtained ≤ 3 days after admission,
OR
Both = Specimens for AST obtained ≤ 3 days after admission and, for patients' stays of > 3 days, at the time of discharge/transfer. Discharge/transfer AST should include all discharges (including discharges to other wards or deaths) and can include the most recent weekly AST if performed > 3 days after admission to the patient care location. Discharge/transfer AST should not be performed on patients who tested positive on AST admission.

Numerator and Denominator Data: Use the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (CDC 57.127) to indicate: 1) AST outcomes monitoring and adherence was performed during the month for MRSA and/or VRE, 2) AST eligible patients, and 3) the timing of AST. No personal identifiers will be collected or reported. (See Tables of Instructions, table 21 for completion instructions.)

If only admission AST is performed, only prevalent cases of MRSA or VRE can be detected in that patient care location. If both admission and discharge/transfer AST are performed, both prevalent and incident cases can be detected. No personal identifiers will be collected or reported.

Admission Prevalent Case:
Numerator Sources:

- Known Positive
- Admission AST or Clinical Positive = Cases ≤ 3 days after admission

Denominator: Total number of admissions

Incident Case:
Numerator: Discharge/transfer AST or Clinical Positive = Cases > 3 days after admission

Denominator: Total number of patient days

NOTE: For research purposes calculating patient-days at risk (i.e., excluding patient-days in which patients were known to be MRSA or VRE colonized or infected) may be a preferable denominator, but for surveillance purposes and ease of aggregating, total number of patient days is required for this module.

Data Analysis: Data are stratified by patient care location and time (e.g., month, quarter, etc.) according to the eligible patients monitored and timing of AST.

AST Admission Prevalence rate =
For Eligible patients = All:
Number of admission AST or clinical positive / Number of admissions X 100

For Eligible patients = NHx:
Number of admission AST or clinical positive + Number of known positive / Number of admissions X 100

AST Incidence rate = Number of discharge/transfer AST or clinical positive / Number of patient days X 1000

II. *Clostridium difficile*–Associated Disease (CDAD) Option

Methodology: The CDAD Option also allows for a choice between the 2 required reporting options and additional optional monitoring methods. As with MDRO monitoring, if a facility chooses to monitor *C. difficile* it must use either Infection Surveillance or Laboratory-identified (LabID) Event reporting. Process measure reporting is optional (but available only for hand hygiene and gown and gloves use – no AST) (Seel Table 1).

C. difficile Infection (CDI) Surveillance, reporting on all NHSN-defined healthcare-associated CDIs from at least one patient care area, is one surveillance option for *C. difficile* (i.e., part of your facility's Monthly Reporting Plan). These data will enhance the ability of NHSN to aggregate national data on CDIs. This method requires active, patient-based, prospective surveillance of healthcare-associated *C. difficile* infections by a trained infection preventionist (IP). This means that the IP shall seek to confirm and classify infections caused by *C. difficile* during a patient's stay in at least one patient care location during the surveillance period.

Laboratory-identified (LabID) Events reporting is the second surveillance option and 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*. These provide proxy measures of *C. difficile* healthcare acquisition, exposure burden, and infection burden based solely on laboratory data and limited admission date data. Reporting of LabID Events for the entire facility (i.e., Overall facility-wide) can provide easily obtainable and valuable information for the facility. LabID Events can also be monitored for specific locations with unique denominator data required from each specific location (i.e., Facility-wide by location or Selected locations). This allows for both location-specific and facility-wide measures.

Process measure monitoring includes optional reporting aspects that allow facilities to systematically report information on *C. difficile* prevention process measures for hand hygiene and gown and gloves use. These measures require direct observation and are described in Sections I.B1a. and I.B1b. (MDRO option - Prevention Process Measures). Personnel other than the IP may be trained to perform these observations and the collection of data elements.

Use NHSN forms to collect all required data, using the definitions of each data field as indicated in the Tables of Instructions (Chapter 14). When denominator data are available from electronic databases, these sources may be used as long as the counts are not substantially different (+ or – 5%) from manually collected counts.

A. Required Reporting

Option 1. *Clostridium difficile* Infection Surveillance

Settings: Surveillance will occur in any of 3 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas (includes hematology/oncology wards, bone marrow transplant units, inpatient dialysis units, solid organ transplant units, long term acute care areas), and (3) any other inpatient care location in

the institution (e.g., surgical wards). Surveillance will not be performed in Neonatal Intensive Care Units (NICU).

Requirements: Surveillance for CDI should be performed in at least one location in the healthcare institution for at least 3 calendar months as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions:
Report all healthcare-associated infections where *C. difficile* is the associated pathogen. Refer to Chapter 17 for gastroenteritis (GI-GE) or gastrointestinal tract (GI-GIT) infections criteria.

Cases of CDI that are not present or incubating at the time of admission (i.e., meets criteria for a healthcare-associated infection) should be reported as gastroenteritis (GI-GE) or gastrointestinal tract (GI-GIT) infections, whichever is appropriate. Report the pathogen as *C. difficile* on the *MDRO or CDAD Infection Event* form (CDC 57.126). If the patient develops both GI-GE and GI-GIT CDI, report only GI-GIT using the date of onset as that of GI-GE CDI. (This corresponds to surveillance for healthcare-onset, healthcare facility-associated (HO-HCFA) CDI in recently published recommendations[3], which is considered the minimum surveillance for CDI.)

CDAD (or CDI) Complications: CDI in a case patient within 30 days after CDI symptom onset with the following:
Admission to an intensive care unit for complications associated with CDI (e.g., for shock that requires vasopressor therapy);
Surgery (e.g., colectomy) for toxic megacolon, perforation, or refractory colitis;
AND/OR
Death caused by CDI within 30 days after symptom onset and occurring during the hospital admission.

Numerator and Denominator Data: The numerator data are reported on the *MDRO or CDAD Infection Event* form (CDC 57.126). (See Tables of Instructions Table 20 for completion instructions). The patient day denominator data are reported using the *MDRO and CDAD and Outcome Measures Monthly Monitoring* form (CDC 57.127). (See Tables of Instructions Table 21 for completion instructions.)

C. Difficile Infections:
Numerator*:* The total number of CDI cases identified during the surveillance month.

Denominator*:* The total number of patient days during the surveillance month.

Data Analysis: Data are stratified by time (e.g., month, quarter, etc.) and by patient care location.

C. difficile Infection rate = Number of CDI cases / Number of patient days X 10,000

Option 2. *Clostridium difficile* Laboratory-identified Event

Settings: Surveillance must be performed either Overall facility-wide or in multiple locations, where *C. difficile* testing in the laboratory is performed routinely only on unformed (i.e., conforming to the shape of the container) stool samples. Consider including *C. difficile* positive laboratory assays from all available inpatient locations as well as all available outpatient locations where care is provided to patients post discharge or prior to admission (e.g., emergency departments, outpatient clinics, and physician offices that submit samples to the facility's laboratory.) Surveillance will not be performed in neonatal intensive care units (NICU) or outpatient dialysis centers.

Requirements: Facilities must choose one or more of three reporting choices: (A) report LabID Events for the entire facility, but by each location (Facility-wide by location), requiring separate denominator submissions for each location, (B) report LabID Events for only Selected locations, and (C) Overall facility-wide (with only one denominator for the entire facility) (See protocol Table 1). Facilities must indicate each reporting choice chosen for the calendar month indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Facilities reporting Overall facility-wide, which allows for the most complete data acquisition, can also report by Selected locations (i.e., (C) and (B)); otherwise, facilities must choose between choice (A) alone, (B) alone, or (C) alone (See protocol Table 1). Surveillance for positive laboratory results must be reported for 3 consecutive months to provide meaningful measures.

Definitions:
CDI-positive laboratory assay:
A positive result for a laboratory assay for *C. difficile* toxin A and/or B,
OR
A toxin-producing *C. difficile* organism detected in the stool sample by culture or other laboratory means.

Duplicate C. difficile-positive test: Any *C. difficile* positive laboratory assay from the same patient following a previous *C. difficile* positive laboratory assay within the past two weeks.

Laboratory-Identified (LabID) Event*:* All non-duplicate *C. difficile* positive laboratory assays. (See Figure 2)

Numerator and Denominator Data:
Numerator: Data will be reported using the *Laboratory-Identified MDRO or CDAD Event* form (CDC 57.128). (See Tables of Instructions Table 19 for completion instructions.)

Denominator: Patient days, admissions, and encounters (for ER and outpatient locations) are reported using the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (CDC 57.127). (See Tables of Instructions Table 21 for completion instructions.)

CDI Data Analysis:
Data are stratified by time (e.g., month, quarter, etc.), incident or recurrent, and either aggregated across the entire facility or stratified by patient care location.

Based on data submitted on appropriate forms, LabID Events will be categorized as follows:

Incident CDI Assay: Any LabID Event from a specimen obtained > 8 weeks after the most recent LabID Event (or with no previous LabID Event documented).
Recurrent CDI Assay: Any LabID Event from a specimen obtained > 2 weeks and ≤ 8 weeks after the most recent LabID Event for that patient.

All incident or recurrent LabID Events are further categorized by NHSN analytical programs utilizing timing of specimen collection, setting where collected, and previous discharge or future admission.

The following definitions and calculations are built into the analysis capabilities of NHSN. These are some of the main metrics, but additional calculations will be available in NHSN.

Categorization Based on Date Admitted to Facility and Date Specimen Collected:
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 of admission).

Community-Onset Healthcare Facility-Associated (CO-HCFA): CO LabID Event collected from a patient who was discharged from the facility ≤ 4 weeks prior to date stool specimen collected.

Healthcare Facility-Onset (HO): LabID Event collected > 3 days after admission to the facility (i.e., on or after day 4).

Calculated CDI Prevalence Rates:
Admission Prevalence Rate = Number of non-duplicate CDI LabID Events per patient per month identified ≤ 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100

Location Percent Admission Prevalence that is Community-Onset = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100

Location Percent Admission Prevalence that is Community-Onset Healthcare Facility-Associated = Number of Admission Prevalent LabID Events to a location that are CO-HCFA / Total number Admission Prevalent LabID Events x 100

Location Percent Admission Prevalence that is Healthcare Facility-Onset = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100

Overall Prevalence Rate = Number of non-duplicate CDI LabID Events per patient per month regardless of time spent in location or facility / Number of patient admissions to the location or facility x 100

Calculated CDI Incidence Rates: (see categorization of Incident, HO, and CO-HCFA above).
CDI Incidence Rate = Number of non-duplicate and Incident CDI LabID Events per patient per month identified > 3 days after admission to the location or facility / Number of patient days for the location or facility x 10,000

Facility CDI Healthcare Facility-Onset Incidence Rate = Number of all Incident HO CDI LabID Events per patient per month / Number of patient days for the facility x 10,000

Facility CDI Combined Incidence Rate = Number of all Incident HO and CO-HCFA CDI LabID Events per patient per month / Number of patient days for the facility x 10,000

B. Optional Reporting

Prevention Process Measures Surveillance (Hand Hygiene and Gown and Gloves Use Only)
See Sections I.B1a and I.B1b under the MDRO Option.

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[1]HICPAC, Management of Multidrug-Resistant Organisms in Healthcare Settings. <http://www.cdc.gov/NCIDOD/DHQP/hicpac_pubs.html>.

[2]Cohen AL, et al. *Infection Control and Hospital Epidemiology*. Oct 2008;29:901-913.

[3]McDonald LC, et al. *Infect Control Hosp Epidemiol* 2007; 28:140-145.

Figure 1. MDRO Test Result Algorithm for Laboratory-Identified (LabID) Events

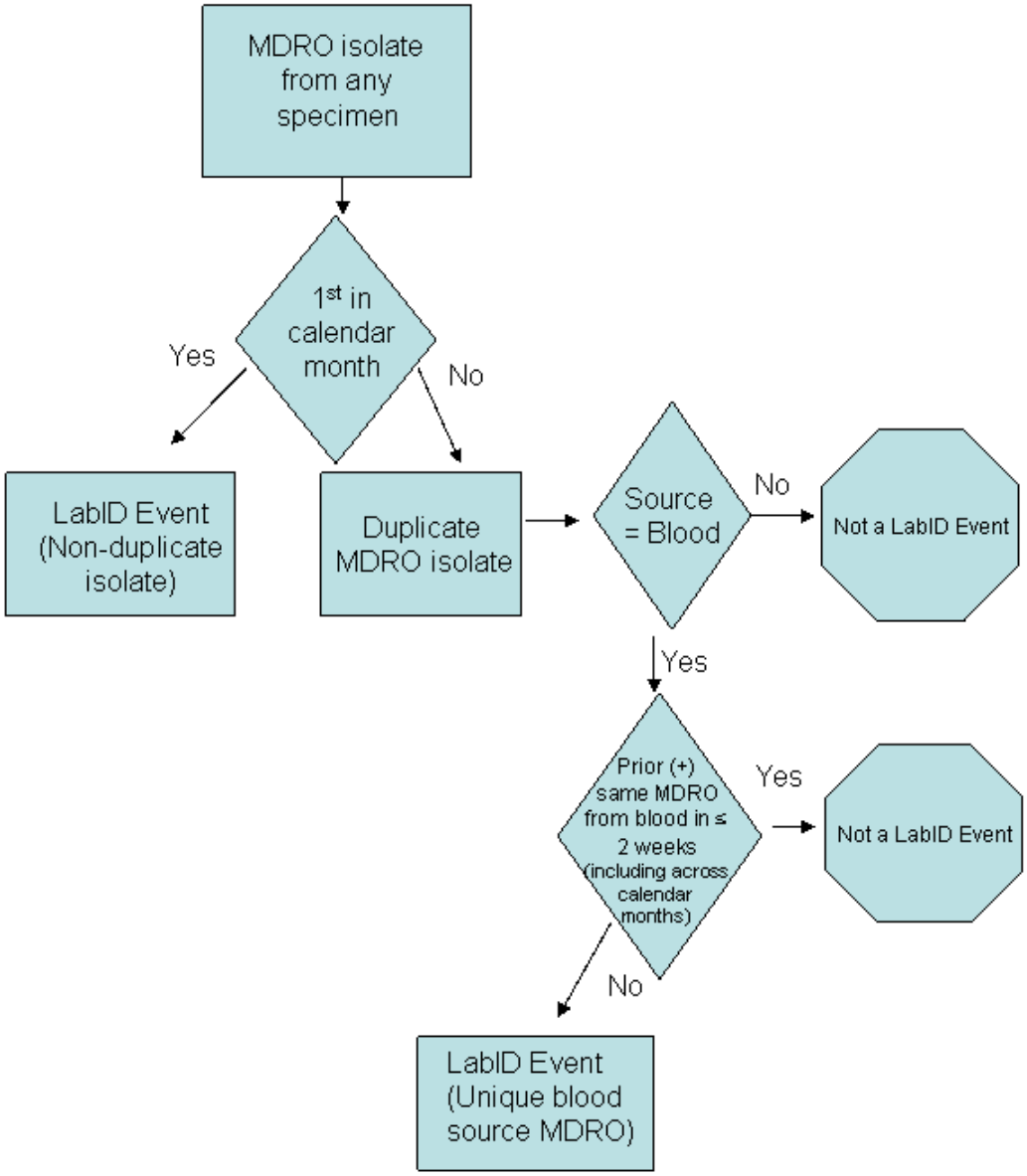

Figure 2. C. difficile Test Result Algorithm for Laboratory Identified (LabID) Events

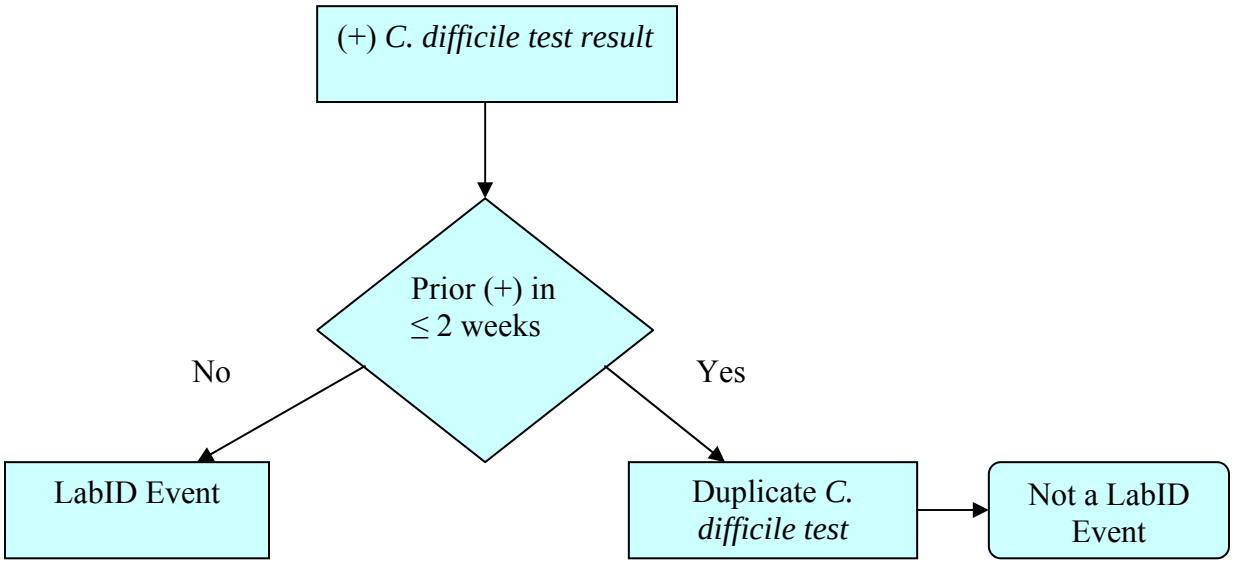

Table 2. Rates and Measures Derived from Various MDRO and CDI Protocol Surveillance Methods

Surveillance Method	Forms	Rate	Measures
MDRO Infection Surveillance	Numerator: *1)Primary Bloodstream Infection* *2) Pneumonia* *3) Urinary Tract Infection* *4) Surgical Site Infection* *5) MDRO Infection Event* Denominator: *MDRO and CDAD Prevention Process & Outcome Measures Monthly Monitoring*	Data are stratified by time (e.g., month, year) and patient care location. MDRO Infection Incidence Rate = Number of infections by MDRO type/ Number of patient days X 1000	Direct HAI MDRO Incidence Rate
Laboratory Identified Event	Numerator: *Laboratory Identified MDRO or CDI Event* Denominator: *MDRO and CDAD Prevention Process & Outcome Measures Monthly Monitoring*	Admission Prevalence Rate = Number of 1st LabID Events per patient per month identified ≤ 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100 Location Percent Admission Prevalence that is Community-Onset = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100 Location Percent Admission Prevalence that is Healthcare Facility-Onset = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100 Overall Prevalence Rate = Number of 1st LabID Events per patient per month regardless of time spent in location or facility / Number of patient admissions to the location or facility x 100	Proxy Measures for MDRO Exposure Burden

Surveillance Method	Forms	Rate	Measures
		MDRO Bloodstream Infection Admission Prevalence Rate = Number of all unique blood source LabID Events per patient per month identified ≤ 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100 MDRO Bloodstream Infection Incidence OR Incidence Density Rate = Number of all unique blood source LabID Events per patient per month identified > 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100 OR Number of patient days for the location or facility x 1,000	Proxy Measures for Bloodstream Infection Admission Prevalence and Incidence
		Overall MDRO Infection/Colonization Incidence Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type and identified > 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100 Overall MDRO Infection/Colonization Incidence Density Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type and identified > 3 days after admission to the location or facility / Number of patient days for the location or facility x 1,000	Proxy Measures for MDRO Healthcare Acquisition
Prevention Process Measures: Hand Hygiene	Numerator & Denominator: *MDRO and CDAD Prevention Process & Outcome Measures Monthly Monitoring*	Hand Hygiene Percent Adherence = Number of contacts for which hand hygiene was performed / Number of contacts for which hand hygiene was indicated X 100	Direct Adherence Percent: Hand Hygiene

Surveillance Method	Forms	Rate	Measures
Gown & Gloves Use		Gown & Glove Use Percent Adherence = Number of contacts during which gown and gloves were used /Number of contacts for which gown and gloves were indicated X 100.	Gown & Gloves Use
Active Surveillance Testing (AST) (MRSA & VRE only)		Admission AST Percent Adherence = Number of patients with admission AST performed / Number of patients admission AST eligible X 100 Discharge/transfer AST Percent Adherence = Number of patients with discharge/transfer AST performed / Number of patients discharge/transfer AST eligible X 100.	Admission AST Discharge/Transfer AST
Active Surveillance Testing Outcome Measures (MRSA & VRE Only)	Numerator & Denominator: *MDRO and CDAD Prevention Process & Outcome Measures Monthly Monitoring*	Eligible patients = All (All patients regardless of history of MDRO) AST Admission Prevalence rate = Number of admission AST or clinical positive / Number of admissions X 100 Eligible patients = NHx (No history) AST Admission Prevalence rate = Number of admission AST or clinical positive + Number of known positive / Number of admissions X 100.	Direct Admission Prevalence Rates of MDRO by AST Eligibility
		AST Incidence Rate = Number of discharge/transfer AST or clinical positive cases / Number of patient days X 1000	Direct MDRO Healthcare Acquisition

Surveillance Method	Forms	Rate	Measures
CDI Measures	Numerator: *CDAD Infection Event* or *Laboratory-Identified MDRO or CDAD Event* Denominator: *MDRO and CDAD Prevention Process & Outcome Measures Monthly Monitoring*	<u>*C. Difficile* Infection rate</u> = Number of *C. difficile* infections/ Number of patient days X 10,000	Direct HAI CDI Incidence Rate
		<u>Admission Prevalence Rate</u> = Number of non-duplicate CDI LabID Events per patient per month identified ≤ 3 days after admission to the location or facility / Number of patient admissions to the location or facility x 100 <u>Location Percent Admission Prevalence that is Community-Onset</u> = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100 <u>Location Percent Admission Prevalence that is Community-Onset Healthcare Facility-Associated</u> = Number of Admission Prevalent LabID Events to a location that are CO-HCFA / Total number Admission Prevalent LabID Events x 100 <u>Location Percent Admission Prevalence that is Healthcare Facility-Onset</u> = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100 <u>Overall Prevalence Rate</u> = Number of non-duplicate CDI LabID Events per patient per month regardless of time spent in location or facility / Number of patient admissions to the location or facility x 100	CDI Prevalence Rates Community-onset Community-onset cases that likely represent intra-facility transmission Healthcare Facility-onset

Surveillance Method	Forms	Rate	Measures
		CDI Incidence Rate = Number of non-duplicate and Incident CDI LabID Events per patient per month identified > 3 days after admission to the location or facility / Number of patient days for the location or facility x 10,000 Facility CDI Healthcare Facility-Onset Incidence Rate = Number of all Incident HO CDI LabID Events per patient per month / Number of patient days for the facility x 10,000 Facility CDI Combined Incidence Rate = Number of all Incident HO and CO-HCFA CDI LabID Events per patient per month / Number of patient days for the facility x 10,000	CDI Incidence Rates

High Risk Inpatient Influenza Vaccination (HRIIV) Module

Background

Influenza viruses can cause severe disease in certain patient populations. The Centers for Disease Control and Prevention (CDC) estimates an average of 36,000 deaths and 226,000 hospitalizations in the United States (U.S.) every year, resulting from influenza infection.[1] Influenza illness occurs in all age groups, but the risk of serious illness and death following infection is highest among persons aged ≥ 65 years, children aged ≤ 2 years, and persons with certain chronic medical conditions.[2-4] These groups have been targeted for influenza vaccination in the U.S. since the early 1960s.[5] The CDC's Advisory Committee on Immunization Practices (ACIP) has expanded seasonal influenza vaccination recommendations based on a combination of high risk-identified age categories and medical conditions on several occasions[6-8] and recently[9] includes children between the ages of 6 months and 18 years, adults aged ≥50 years, and specific groups of adults or children over 6 months of age with certain medical conditions.

There are two types of influenza vaccine: trivalent inactivated influenza (TIV) vaccine and live attenuated influenza vaccine (LAIV). Federal Drug Administration (FDA) licensed the TIV vaccine for use in persons over 6 months of age, including those individuals with high risk conditions. The FDA licensed in 2007 the current LAIV for use among health children and adults from 2 through 49 years of age, if they are healthy and not pregnant. [10]

Methodology

The High Risk Inpatient Influenza Vaccination (HRIIV) Module targets the healthcare facility's inpatient population, who are identified using the high risk criteria for seasonal influenza vaccination (Table 1).

The High Risk Inpatient Influenza (HRIIV) Module can be completed using either retrospective medical record review (Method A or Method B) *or* prospective surveillance of each inpatient admission (Method B). Two separate approaches (Method A or Method B), requiring the use of two separate sets of forms, are used to report data for the HRIIV Module. Ideally the same method should be used for each month of the influenza season in which the module is completed. Multiple admissions by the same patient during the same month should be evaluated as separate encounters for this module. For those patients who decline influenza vaccination, reasons for declination (medical contraindications and personal) are captured (Table 2).

For Method B, a trained individual (e.g. an infection preventionist [IP], staff nurse) shall initially seek to classify all inpatient admissions as either meeting or not meeting high risk criteria for influenza vaccination during the review period and then determine if influenza vaccination was offered and whether accepted or declined during the course of the patient's admission. Personnel other than the IP may be trained to perform these observations, as well as to collect denominator and numerator data. When denominator and numerator data are available from electronic

databases, these sources may be used as long as the counts are not substantially different (+/- 5%) from manually collected counts.

The CDC forms 57.130, 57.131, 57.132 and 57.133 (Tables of Instructions, Tables 14, 15, 16, and 17 respectively) used to collect all required HRIIV data depend on whether Method A or Method B is the selected surveillance approach (Table 3).

An optional tool, *HRIIV Standing Orders* form (CDC 57.134), is also available to provide a chart document that will allow for the capture of needed data elements to complete this module. The minimum requirement to participate in this module is one month during the influenza season (October through March), but maximal benefit is obtained by completing the module for each month of the entire influenza season.

Table 1. High Risk Criteria for Inpatient Influenza Vaccination[9]	
Adult aged ≥ 50 years	
Child/adolescent aged 6 months – 18 years	
Child/adolescent aged 6 months–18 years receiving long-term aspirin therapy	
Resident of nursing homes or other chronic-care facilities	
Pregnancy during the influenza season	
Adult or child over 6 months of age who has: • Chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological, or metabolic disorders (including diabetes mellitus) • Immunosuppression (including immunosuppression caused by medications or by human immunodeficiency virus [HIV]) • Any condition (e.g., cognitive dysfunction, spinal cord injuries, seizure disorders, or other neuromuscular disorders) that can compromise respiratory function or the handling of respiratory secretions or that can increase the risk for aspiration	
Examples of ICD-9-CM diagnosis codes associated with high risk disease conditions that may make patients candidates for influenza vaccination (may not be all inclusive).	
HIGH-risk category	HIGH-risk sub-category and ICD-9 codes ("x" indicates can be any value)

Chronic cardiac disease	☐ Acute rheumatic fever (391.xx–392.xx) ☐ Chronic rheumatic heart disease (393.xx–398.xx) ☐ Hypertensive heart disease (402.xx, 404.xx) ☐ Ischemic heart disease (410.xx–414.xx) ☐ Diseases of pulmonary circulation (416.xx, 417.xx) ☐ Other forms of heart disease (421.xx, 423.xx, 424.xx, 425.xx, 427.1–427.5, 427.8, 428.xx, 429.xx) ☐ Atherosclerosis, polyarteritis nodosa (440.xx, 446.xx) ☐ Congenital anomalies (745.xx–747.xx) ☐ Surgical/device conditions (V42.1, V45.0, V45.81, V45.82) ☐ Cardiovascular syphilis (093.xx) ☐ Candidal endocarditis (112.81) ☐ Myocarditis due to toxoplasmosis (130.3)
Chronic pulmonary	☐ Other metabolic and immunity disorders (277.0, 277.6) ☐ COPD and allied conditions (491.xx–496.xx) ☐ Pneumoconioses/other lung diseases due to external agents (500.xx–506.xx, 507.0, 507.1, 508.xx) ☐ Other diseases of respiratory system (510.xx, 513.xx–517.xx, 518.0–518.3, 519.0, 519.9) ☐ Congenital anomalies (748.4–748.6, 759.3) ☐ Lung transplant (V426) ☐ Tuberculosis (011.xx, 012.xx) ☐ Diseases due to other mycobacteria (031.0) ☐ Sarcoidosis (135.xx)
Chronic renal disease	☐ Hypertensive renal disease (403.xx) ☐ Nephritis, nephrotic syndrome, nephrosis (581.xx–583.xx, 585.xx–587.xx, 588.0, 588.1) ☐ Chronic pyelonephritis (590.0) ☐ Other specified disorders of kidney and ureter (593.8) ☐ Dialysis and transplant (V42.0, V45.1, V56)
Diabetes mellitus	☐ Diabetes mellitus (250.xx, 251.xx, 648.0) ☐ Complications of diabetes (357.2, 362.0, 362.11, 366.41)
Hemoglobinopathies	☐ Anemias (282.xx–284.xx)
Immunosuppressive disorders	☐ HIV/retroviral disease (042.xx–044.xx, 079.5, V08) ☐ Disorders involving immune mechanism (279.xx) ☐ Diseases of blood and blood-forming organs (288.0, 288.1, 288.2) ☐ Polyarteritis nodosa (446.xx) ☐ Diseases of musculoskeletal system and connective tissue (710.0, 710.2, 710.4, 714.xx) ☐ Organ/tissue transplants (V420–V422, V426–V429) ☐ Radiation/chemotherapy (V580, V581) ☐ Malignancies (140.xx–208.xx)
Other metabolic and immunity disorders	☐ Disorders of adrenal glands (255.xx) ☐ Other disorders (270.xx, 271.xx, 277.2, 277.3, 277.5, 277.8)
Liver diseases	☐ Chronic liver disease and cirrhosis (571.xx) ☐ Liver abscess and sequelae of chronic liver disease (572.1–572.8)
Neurological/musculoskeletal	☐ Psychotic conditions (290.xx, 294.1) ☐ Mental retardation (318.1, 318.2) ☐ Hereditary and degenerative diseases of CNS (330.xx, 331.xx, 333.0, 333.4–333.9, 334.xx, 335.xx)

	☐ Other disorders of CNS (340.xx-341.xx, 343.xx, 344.0) ☐ Disorders of peripheral nervous system (358.0, 358.1, 359.1, 359.2) ☐ Late effects of CVD (438.xx) ☐ Chondrodystrophy (756.4)
Other	_____ _____ _____

Table 2. Examples of Medical Contraindications to Influenza Vaccination and for Declining Influenza Vaccination for Personal (non-medical) Reasons

Medical Contraindications (may not be all-inclusive):

Allergy to vaccine components
History of Guillain-Barré syndrome within 6 weeks of previous influenza vaccination
Febrile illness (Temp > 101.5°F in past 24 hours)
Other (Please specify.)

Personal (non-medical) reasons for declining vaccination (may not be all-inclusive):

Fear of needles/injections
Fear of side effects
Perceived ineffectiveness of vaccine
Religious or philosophical objections
Concern for transmitting vaccine virus to contacts
Other (Please specify.)

Table 3. Forms and Tables of Instructions for Method A or Method B

Method	Form	Form Name	Tables of Instructions
A	CDC 57.130	*HRIIV Monthly Monitoring Form - Method A*	Table 14
B	CDC 57.131	*HRIIV Monthly Monitoring Form - Method B*	Table 15
B	CDC 57.132	*HRIIV Method B Form - Part 1*	Table 16
B	CDC 57.133	*HRIIV Method B Form - Part 2*	Table 17
Either A or B	CDC 57.134	*HRIIV Standing Orders Form – Optional*	Table 18

High Risk Inpatient Influenza Vaccination – Method A

Introduction: Method A requires the use of a single form, the *HRIIV Monthly Monitoring Form – Method A* (CDC 57.130 and Tables of Instructions, Table 14) to collect all data for the period of surveillance. This retrospective method consists of determining the total number of patients in 7 separate categories (6 required, 1 optional) during the surveillance month(s). The value of this method for data collection is the simplicity of data collection requirements.

HRIIV Method A will enable participating facilities and CDC to calculate a variety of rates including:

a. Prevalence of admissions meeting high risk criteria for influenza vaccination, both those who have previously received influenza vaccine during the current influenza season and those that have not been previously vaccinated.
b. Percent adherence to recommended guidance for influenza vaccination in high risk inpatients not previously vaccinated during the current influenza season.

Settings: This is a facility-wide surveillance in which all NHSN inpatients will be monitored during the selected month(s).

Requirements: Surveillance will consist of a review of all NHSN inpatients facility-wide to 1) determine whether they meet high risk criteria for influenza vaccination (denominator) and 2) determine the number of inpatients meeting high risk criteria for influenza vaccination who are offered influenza vaccination during the course of their admission and all those who receive influenza vaccination during their admission (numerators). Surveillance must be conducted for at least one calendar month during the influenza season as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Ideally the facility should conduct the surveillance during each month of the influenza season (October through March).

Definitions:
(All box numbers refer to boxes on *HRIIV Monthly Monitoring Form – Method A*, CDC 57.130.)

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

Total number of patient admissions (Box 1): During the month selected for surveillance, the count of all NHSN inpatients admitted to the facility.

Total number of patients meeting high risk criteria for influenza vaccination (Box 2): During the month selected for surveillance, the count of NHSN inpatients meeting one or more of the criteria listed in Table 1 "High Risk Criteria for Inpatient Influenza Vaccination." Note that patients that have been previously vaccinated during the current influenza season do not meet the high risk criteria for influenza vaccination for inclusion in this box.

Total number of patients previously vaccinated during current influenza season (Box 3): During the month selected for surveillance, the count of all NHSN inpatients who had previously received influenza vaccination during the current influenza season by either history or documentation.

Total number of patients meeting high risk criteria previously vaccinated during the current influenza season (Box 4): During the month selected for surveillance, the count of all NHSN inpatients meeting high risk criteria (noted above for Box 2) who had previously received influenza vaccination during the current influenza season by either history or documentation. The number in this box should be less than or equal to the number in Box 2.

Total number of patients meeting high risk criteria not previously vaccinated during the current influenza season (Box 5): During the month selected for surveillance, the count of NHSN inpatients meeting high risk criteria (Box 2) minus the count of NHSN inpatients meeting high risk criteria previously vaccinated during the current influenza season (Box 4). Refer to Table 1 for list of high risk criteria for inpatient influenza vaccination.

Patients meeting high risk criteria offered vaccination but declining for reasons other than medical contraindication (Box 6): During the month selected for surveillance, the count of NHSN inpatients meeting high risk criteria offered vaccination but who declined for reasons other than medical contraindication. Refer to Table 2 for examples of personal (non-medical) reasons for declining vaccination.

Patients meeting high risk criteria offered vaccination but having medical contraindication (Box 7): During the month selected for surveillance, the count of NHSN inpatients offered vaccination but who declined because of medical contraindication(s). Refer to Table 2 for examples of medical contraindications.

Patients meeting high risk criteria receiving vaccination during admission (Box 8): During the month selected for surveillance, the count of all NHSN inpatients with documentation in the medical record of receiving influenza vaccination during the course of their hospital admission prior to being discharged.

Total number of patients offered vaccination for high risk criteria (Box 9): The sum of the count of all NHSN inpatients offered vaccination but who declined for reasons other than medical contraindication (Box 6) plus all patients offered vaccination but who declined because of medical contraindication(s) (Box 7) plus all NHSN inpatients with documentation in the medical record of receiving influenza vaccination during the course of their hospital admission prior to being discharged (Box 8).

Refer also to the Key Terms, Chapter 16, for other definitions.

Numerator and Denominator Data: The numerator and denominator data are reported on the "High Risk Inpatient Influenza Vaccination Monthly Monitoring Form – Method A" (CDC 57.130) in boxes 1-9 for the month(s) selected for surveillance (Tables of Instructions, Table 14).

Data Analysis: Data aggregated across the entire facility are stratified by time (e.g., month, influenza season). Table 4 shows the "Formulas for Metrics" that can be calculated from Method A.

Table 4. Formulas for Metrics: Method A
All data come from HRIIV Monthly Monitoring Form - Method A (CDC 57.130)

	Metric	Method A Formula (x 100)
1	Prevalence rate for all high risk inpatients among all inpatient admissions	Box 2 / Box 1
2	Prevalence rate for high risk inpatients not previously vaccinated among all inpatients admissions	Box 5 / Box 1
3	Prevalence rate of high risk inpatients previously vaccinated among total population of high risk inpatients	Box 4 / Box 2
4	Adherence rate for offering influenza vaccination to high risk inpatients among all eligible high risk inpatients	Box 9 / Box 5
5	Adherence rate for receiving influenza vaccination by high risk inpatients among all high risk inpatients	Box 8 / Box 5
6	Adherence rate for receiving influenza vaccination by high risk inpatients among all medically eligible high risk inpatients	Box 8 / Box 5 – Box 7
7	Adherence rate for receiving influenza vaccination by high risk inpatients among all medically eligible, willing high risk inpatients	Box 8 / Box 5 – [Box 6 + Box 7]
8	Declination rate for high risk inpatients eligible for vaccination among all high risk inpatients offered vaccine	Box 6 + Box 7 / Box 9
9	Declination rate due to personal (non-medical) reasons for high risk inpatients eligible for influenza vaccination among all high risk inpatients offered vaccine	Box 6 / Box 9
10	Declination rate due to medical contraindications for high risk inpatients eligible for influenza vaccination among all high risk inpatients offered vaccine	Box 7 / Box 9

11	Failure rate for offering vaccine to high risk inpatients medically eligible for influenza vaccination among all medically eligible high risk inpatients	Box 5 – Box 9 / Box 5 – Box 7
12	Prevalence rate of all inpatients previously vaccinated during the current influenza season among all inpatient admissions	Box 3 / Box 1

High Risk Inpatient Influenza Vaccination – Method B

Introduction: This module will allow facilities to evaluate the rate of adherence to guideline recommendations for influenza vaccination of NHSN inpatients meeting high risk criteria for vaccination.

Method B requires the use of 3 separate CDC forms.

- The *HRIIV Monthly Monitoring Form - Method B* (CDC 57.131 and Tables of Instructions, Table 15). This form is a modified version of the monthly monitoring form for Method A requiring the total number of NHSN inpatients in 2 separate categories for a specified month during the surveillance period. In addition each NHSN inpatient identified as meeting high risk criteria and who has not previously been vaccinated during the current influenza season will need to have a *HRIIV Method B Form - Part 1* and contingent on whether vaccine was offered *HRIIV Method B Form – Part 2* completed.
- *HRIIV Method B Form - Part 1* (CDC 57.132 and Tables of Instructions, Table 16): This form provides specific data indicating what criteria the NHSN inpatient met to be classified as high risk for complications from influenza that would warrant influenza vaccination while an NHSN inpatient.
- *HRIIV Method B Form - Part 2* (CDC 57.133 and Table of Instructions, Table 17): This form provides specific data indicating whether or not vaccine was offered to NHSN inpatients meeting high risk criteria, when vaccine was received and what type of vaccine was administered. In addition if vaccine is offered but declined this form indicates the reason(s) why it was declined.

The value of this method is that the information collected will assist facilities in identifying whether NHSN inpatients meeting high risk criteria for influenza vaccination during an admission are actually receiving vaccination. Additionally, IPs will be able to identify specific gaps in adherence and recommend changes in practices to ensure that eligible patients are being vaccinated.

HRIIV Method B will enable participating facilities and CDC to calculate a variety of rates including:

a. Prevalence of admissions meeting high risk criteria for influenza vaccination, both those who have previously received influenza vaccine during the current influenza season and

those that have not been previously vaccinated.

b. Percent adherence to recommended guidance for influenza vaccination in high risk NHSN inpatients not previously vaccinated during the current influenza season.
c. Patient level data for high risk inpatients not receiving influenza vaccination in order to determine where failures in maintaining adherence to guidelines for vaccination are occurring.

Settings: This is a facility-wide surveillance in which all NHSN inpatients will be monitored during the selected month(s).

Requirements: Surveillance will consist of a review of all NHSN inpatients facility-wide to 1) determine whether they meet high risk criteria for influenza vaccination (denominator) and 2) determine the number of NHSN inpatients meeting high risk criteria for influenza vaccination who are offered influenza vaccination during the course of their admission and all those who receive influenza vaccination during their admission (numerators). Surveillance must be conducted for at least one calendar month during the influenza season as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Ideally the facility should conduct the surveillance during each month of the influenza season (October through March).

Method B requires determination of the number of NHSN inpatients in the following categories for the month selected for review. (All box numbers refer to the boxes found on the *HRIIV Monthly Monitoring Form - Method B*, CDC 57.131.)

- Total number of NHSN inpatient admissions (Box 1).
- Total number of NHSN inpatients previously vaccinated during the current influenza season (Box 2 - optional).
- Total number of NHSN inpatients meeting high risk criteria previously vaccinated during the current influenza season (Box 3).

In addition all NHSN inpatient admissions found to meet the high risk criteria but not previously vaccinated during the current influenza season will need to have *HRIIV Method B Form - Part 1* (CDC 57.132) and *HRIIV Method B Form - Part 2* (CDC 57.133) completed as indicated. Review all NHSN inpatient admissions for high risk criteria for influenza vaccination (denominator) and determine whether they meet the criteria for high risk (Table 1). Note that all NHSN inpatients who meet high risk criteria but have previously been vaccinated during the current influenza season do not require the *HRIIV Method B Form - Part 1* (CDC 57.132) and *HRIIV Method B Form - Part 2* (CDC 57.133) to be completed but should be totaled and entered on the *HRIIV Monthly Monitoring Form - Method B* (CDC 57.131) in Box 2.

All NHSN inpatients meeting high risk criteria for influenza vaccination should have all applicable high risk criteria indicated on the *HRIIV Method B Form - Part 1* (CDC 57.132). Additionally, all NHSN inpatients meeting high risk criteria should have the *HRIIV Method B Form - Part 2* (CDC 57.133) completed if there was documented evidence in the medical record during that admission whether they were offered vaccine and the outcome of the vaccine

offering: receipt of vaccine or declination due to medical contraindications or personal (non-medical) reasons. Table 2 provides examples of medical contraindications and patients' personal (non-medical) reasons for declination (numerators).

Definitions: Refer to Table 1 for "High Risk Criteria for Inpatient Influenza Vaccination" to identify the necessary high risk criteria. (All box numbers refer to the boxes found on the *HRIIV Monthly Monitoring Form - Method B*, CDC 57.131.)

Total number of patient admissions (Box 1): All NHSN inpatient admissions whose discharge date does not equal the admission date starting with admission dates on the first day of the month reviewed through admissions on the last day of the month reviewed. The discharge date may extend beyond the last day of the month reviewed. Determination of NHSN inpatient admissions for the month reviewed is based on the date of admission occurring during the month being reviewed.

Total number of NHSN inpatients previously vaccinated during the current influenza season (Box 2 - optional): Any NHSN inpatient who has also been previously vaccinated by either history or documentation during the current influenza season in which the review month occurs.

Total number of patients meeting high risk criteria previously vaccinated during the current influenza season (Box 3): Any NHSN inpatient meeting high risk criteria as noted above who has also been previously vaccinated by either history or documentation during the current influenza season in which the review month occurs.

Refer to the NHSN Key Terms, Chapter 16, for other definitions.

Numerator and Denominator Data: The numerator and denominator data for High Risk Inpatient Influenza Vaccination is reported on the appropriate *HRIIV Method B Form – Part 1* (CDC 57.132) and *HRIIV Method B Form – Part 2* (CDC 57.133). In addition some required components of denominator data can be found on the *HRIIV Monthly Monitoring Form - Method B* (CDC 57.131).

Data Analysis: Data aggregated across the entire facility are stratified by time (e.g., month, influenza season, etc.). Table 5 shows the "Formulas for Metrics" that can be calculated from Method B.

Table 5. Formulas for Metrics: Method B

Data come from three CDC forms:
(57.131) = *HRIIV Monthly Monitoring Form - Method B*
(57.132) = *HRIIV Method B Form - Part 1*
(57.133) = *HRIIV Method B Form - Part 2*

	Metric	Method B Formula (x 100)
1	Prevalence rate for all high risk inpatients among all inpatient admissions	Total # Part 1 Forms (57.132) + Box 3 (57.131) / Box 1 (57.131)
2	Prevalence rate for high risk inpatients not previously vaccinated among all inpatients admissions	Total # Part 1 Forms (57.132) / Box 1 (57.131)
3	Prevalence rate of high risk inpatients previously vaccinated among total population of high risk inpatients	Box 3 (57.131) / Total # Part 1 Forms (57.132) + Box 3 (57.131)
4	Adherence rate for offering influenza vaccination to high risk inpatients among all eligible high risk inpatients	Total # Part 1 Forms (57.132) "Vaccine offered" = "Yes" / Total # Part 1 Forms (57.132)
5	Adherence rate for receiving influenza vaccination by high risk inpatients among all high risk inpatients	Total # Part 2 Forms (57.133) "Vaccine administered" = "Yes" Total # Part 1 Forms (57.132)
6	Adherence rate for receiving influenza vaccination by high risk inpatients among all medically eligible high risk inpatients	Total # Part 2 Forms (57.133) "Vaccine administered" = "Yes" Total # Part 1 Forms (57.132) – Total # Part 2 Forms (57.133) "Vaccine declined" = "Yes" (medical contraindications)
7	Adherence rate for receiving influenza vaccination by high risk inpatients among all medically eligible, willing high risk inpatients	Total # Part 2 Forms (57.133) "Vaccine administered" = "Yes" Total # Part 1 Forms (57.132) – Total # Part 2 Forms (57.133) "Vaccine declined" = "Yes"
8	Declination rate for high risk inpatients eligible for vaccination among all high risk inpatients offered vaccine	Total # Part 2 Forms (57.133) "Vaccine declined" = "Yes" / Total # Part 2 Forms (57.133)

9	Declination rate due to personal (non-medical) reasons for high risk inpatients eligible for influenza vaccination among all high risk inpatients offered vaccine	Total # Part 2 Forms (57.133) "Vaccine declined" = "Yes" (personal reasons) / Total # Part 2 Forms (57.133)
10	Declination rate due to medical contraindications for high risk inpatients eligible for influenza vaccination among all high risk inpatients offered vaccine	Total # Part 2 Forms (57.133) "Vaccine declined" = "Yes" (medical contraindications) / Total # Part 2 Forms (57.133)
11	Failure rate for offering vaccine to high risk inpatients medically eligible for influenza vaccination among all medically eligible high risk inpatients	Total # Part 1 Forms (57.132) – Total Part 1 SS "Vaccine offered"= "Yes" / Total # Part 1 Forms (57.132) – Total # Part 2 Forms (57.133) "Vaccine declined" = "Yes" (medical contraindications)
12	Prevalence rate of all inpatients previously vaccinated during the current influenza season among all inpatient admissions	Box 2 (57.131) / Box 1 (57.131)

Optional Standard Orders Form for HRIIV Data Collection

An optional Standing Orders Form (CDC 57.134) to provide for a single document that can be used as part of all inpatient medical records during the month(s) being reviewed is available as part of this module to assist with data collection. See Tables of Instructions, Table 18, for completion instructions.

References

[1] Key facts about seasonal flu retrieved March 9, 2009 at http://www.cdc.gov/flu/keyfacts.htm

[2] Monto, A.S. and Kioumehr, F. The Tecumseh study of respiratory illness. IX. Occurrence of influenza in the community, 1966–1971. Am J Epidemiol 1975; 102:553–63.

[3] Barker, W.H. Excess pneumonia and influenza associated hospitalization during influenza epidemics in the United States, 1970–78. Am J Public Health 1986; 76:761–5.

[4] Barker, W.H. and Mullooly, J.P. Impact of epidemic type A influenza in a defined adult population. Am J Epidemiol 1980;112:798–813.

[5] Surgeon General's Advisory Committee on Influenza. Recommendations for influenza immunization and control in the civilian population. Washington, DC: United States Public Health Service; 1962, supp. 1-7.

[6] Centers for Disease Control and Prevention. Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR 2006; 55(RR10):1-42.

[7] Centers for Disease Control and Prevention. Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP); MMWR 2004; 53(RR06):1-40.

[8] Centers for Disease Control and Prevention. Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP); MMWR 2000; 49 (RR-3):1-38.

[9]Centers for Disease Control and Prevention. Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR 2008; 57(RR-7): 1-60.

[10]Recommendations for using TIV and LAIV during the 2008–09 influenza season retrieved March 9, 2009 at http://www.cdc.gov/flu/professionals/acip/recommendations.htm

Tables of Instructions

		Infection Event form	
21	57.127	Instructions for Completion of the **MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring** form	47

Table 1. Instructions for Completion of the Patient Safety Monthly Reporting Plan Form (CDC 57.106)

Data Field	Instructions for Form Completion
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Month/Year	Required. Enter the month and year for the surveillance plan being recorded; use MM/YYYY format.
No NHSN Patient Safety Modules Followed this Month	Conditionally required. Check this box if you do not plan to follow any of the NHSN Patient Safety Modules during the month and year selected.
Device-Associated Module	
Locations	Conditionally required. If you plan to follow device-associated events, enter the location codes for those facility locations where patients are housed overnight and from which you will collect denominator data (i.e., inpatient locations). If you plan to follow CLIP (see below), any type of patient care location where central lines are inserted may be entered.
CLABSI	Conditionally required. If you plan to follow device-associated events, check this box if you will collect central line-associated bloodstream infection (CLABSI) data and corresponding summary (denominator) data for the location in the left column.
DE	Conditionally required. If you plan to follow device-associated events, check this box if you will collect dialysis event (DE) data and corresponding summary (denominator) data for the outpatient dialysis location in the left column.
VAP	Conditionally required. If you plan to follow device-associated events, check this box if you will collect ventilator-associated pneumonia (VAP) data and corresponding summary (denominator) data for the location in the left column.
CAUTI	Conditionally required. If you plan to follow device-associated events, check this box if you will collect catheter-associated urinary tract infection (CAUTI) data and corresponding summary (denominator) data for the location in the left column.
CLIP	Conditionally required. Check this box if you will collect central line insertion practice (CLIP) data for the location indicated in the left column. These locations may be any type of patient care area where central lines are inserted (e.g., ward, OR, ED, ICU, outpatient clinic, etc.).
Procedure-Associated Module	
Procedures	Conditionally required. If you plan to follow procedure-associated events, list the procedure codes for those NHSN operative procedures for which you will collect data about selected procedure-associated

Data Field	Instructions for Form Completion
	events and procedure-level denominator data.
SSI (Circle one setting)	Conditionally required. For each selected NHSN operative procedure in the left column, if you plan to follow SSIs, choose the patient population for which you will monitor this procedure. Circle "In" to follow only inpatients, circle "Out" to follow only outpatients, or circle "Both" to follow inpatients and outpatients. If SSIs will not be monitored for a listed procedure for this month, do not circle any of the choices.
Post-procedure PNEU	Conditionally required. For each selected NHSN operative procedure in the left column, if you plan to follow post-procedure pneumonia (PPP), circle "In". If you do not monitor PPP, leave this unmarked. NOTE: Inpatient ("In") is the only setting option for monitoring post-procedure pneumonia.
Medication-Associated Module: Antimicrobial Use and Resistance	
Locations	Conditionally required. If you plan to follow the antimicrobial use and resistance (AUR) option, enter the location codes for those facility locations from which you will collect data about antibiotic use and/or resistance. If you select this module, you must choose: 1) at least one intensive care unit (ICU) or specialty care area (SCA) location, 2) all non-ICU/SCA locations combined, and 3) all outpatient locations combined. EXCEPTION: Pharmacy data are not collected for outpatient locations.
Microbiology	Conditionally required. If you plan to follow the AUR option, check if you will submit microbiology data for the selected location.
Pharmacy	Conditionally required. If you plan to follow the AUR option, check if you will submit pharmacy data for the selected location. NOTE: Pharmacy data are not submitted from outpatient areas.
MDRO and CDAD Module	
Locations	Conditionally required. If you plan to perform LabID event surveillance overall facility-wide (using Method C as defined in the protocol), use Locations **ALL**. This will enable you to use total hospital admissions and patient days for your denominators on the *MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring* form (rather than stratified by location). If you want to perform facility-wide by location (Method A), you must enter each specific facility location being monitored.
Setting	Conditionally required. If overall facility-wide surveillance is being performed, circle whether it includes only inpatient locations, only outpatient locations or both in and outpatient locations.
Specific Organism Type	Conditionally required. Enter each organism you will be following: MRSA, MRSA/MSSA, VRE, MDR-*Klebsiella* spp., MDR-

Data Field	Instructions for Form Completion
	Acinetobacter spp. and/or *C. difficile.*
LabID Event	Conditionally required. Check this on the top section of the form only if performing surveillance on the organism facility-wide but not by location (i.e., using only Method C).
Locations	Conditionally required. If you plan to perform MDRO or *C. difficile* infection surveillance, LabID Event reporting, or monitor process and/or outcome measures, list the individual location code on each line for the areas in your facility that you intend to monitor.
Specific Organism Type	Conditionally required. For the location(s) selected, enter the organism you will be following in each: MRSA, MRSA/MSSA, VRE, MDR-*Klebsiella* spp., MDR-*Acinetobacter* spp. and/or *C. difficile.*
Infection Surveillance	Conditionally required. Infection surveillance or LabID Event reporting in ≥ 1 patient care area is required for each MDRO your facility chooses to monitor (MRSA, MRSA/MSSA, VRE, MDR-*Klebsiella* spp., MDR-*Acinetobacter* spp*., or C. difficile*).
AST Timing	Conditionally required. For the given location and organism, If you plan to perform active surveillance testing (AST) for the organism, indicate whether testing will be done on admission (Adm) only or at admission and at discharge/transfer (Both).
AST Eligible	Conditionally required. For the given location and organism, circle All if **all** patients will be eligible for AST, OR, circle NHx to indicate that the only patients eligible for testing will be those with no history of MDRO colonization or infection in the past 12 months as documented by the admitting facility.
Incidence	Conditionally required. Check this box if you plan to report incidence of the organism at the location listed in the left column using AST and clinical positives.
Prevalence	Conditionally required. Check this box if you plan to report prevalence of the organism at the location listed in the left column using AST, clinical positive and known positive cases.
LabID Event	Conditionally required. For the given location and organism, indicate if you plan to monitor for Laboratory-identified (LabID). Infection Surveillance or LabID Event reporting in at least one patient care area is required for each organism your facility chooses to monitor (MDRO or *C. difficile*).
HH	Conditionally required. Check this if you plan to monitor Hand Hygiene adherence in the location specified. Ideally, this should be the patient care location(s) also selected for MDRO Infection or *C. difficile* surveillance.
GG	Conditionally required. Check this if you plan to monitor gown and

Data Field	Instructions for Form Completion
	gloves use adherence in the location specified. Ideally, this should be the patient care location(s) also selected for MDRO Infection or *C. difficile* surveillance.
High Risk Inpatient Influenza Vaccination Module	
Method A:/Method B:	Conditionally required. Select either Method A or Method B.

Table 2. Instructions for Completion of the Primary Bloodstream Infection (BSI) Form (CDC 57.108)

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer.
Patient ID #	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID #	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Check Female or Male to indicate the gender of the patient.
Date of Birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity Hispanic or Latino Not Hispanic or Not Latino	Optional. If patient is Hispanic or Latino, check this box. If patient is not Hispanic or not Latino, check this box.
Race	Optional. Check all the boxes that apply to identify the patient's race.
Event type	Required. BSI.
Date of event	Required. The date when the first clinical evidence of the BSI appeared or the date the blood culture was collected, whichever comes first. Enter date of this event using this format: MM/DD/YYYY.
Post-procedure BSI	Optional. Check Y if this event occurred after an NHSN defined procedure but before discharge from the facility, otherwise check N.
NHSN procedure code	Conditionally required. If Post-procedure BSI = Y, enter the appropriate NHSN procedure code. NOTE: A BSI cannot be "linked" to an operative procedure unless that procedure has already been added to NHSN. If the procedure was previously added, and the "Link to Procedure" button is clicked, the fields pertaining to the operation will be autoentered by the computer.
ICD-9-CM procedure code	Optional. The ICD-9-CM code may be entered here instead of (or in addition to) the NHSN Procedure Code. If the ICD-9-CM code is entered, the NHSN code will be autoentered by the computer. If the NHSN code is entered first, you will have the option to select the appropriate ICD-9-CM code. In either case, it is optional to select the ICD-9-CM code. Only those ICD-9-CM codes identified in Table 10 of the Procedure-associated Module section are allowed.

Data Field	Instructions for Data Collection
MDRO infection	Required. Enter "Yes", if the pathogen is being followed for the MDRO/CDAD Module and is part of your Monthly Reporting Plan: MRSA, MSSA (MRSA/MSSA), VRE, MDR-*Klebsiella*, MDR-*Acinetobacter* or *C. difficile*. If the pathogen for this event happens to be an MDRO but your facility is not following the MDRO/CDAD Module in your Monthly Reporting Plan, answer "No" to this question. If the specific event type is CSEP, answer "No" to this question.
Location	Required. Enter the inpatient location to which the patient was assigned when the BSI was identified. If the BSI develops in a patient within 48 hours of transfer from a location, indicate the transferring location, not the current location of the patient.
Date admitted to facility	Required. Enter date patient admitted to facility using this format: MM/DD/YYYY.
Risk Factors: If ICU/Other locations, central line	Required. Answer this question if the location is an intensive care unit (ICU) or location other than a specialty care area (SCA) or neonatal intensive care unit (NICU). Check Y if patient had a central line during the 48 hour period before event date, otherwise check N. NOTE: If the patient has both a peripheral and a central line and the BSI can clearly be attributed to the peripheral line (e.g., pus at insertion site and matching pathogen from pus and blood), check N.
Risk Factors: If Specialty Care Area, Permanent central line	Required. Answer these questions if the location is an SCA: Check Y if patient had a tunneled or implanted central line during the 48-hour period before event date, otherwise check N.
Temporary central line	Check Y if patient had a non-tunneled central line during the 48-hour period before event date, otherwise check N.
Risk Factors: If NICU, Central line	Required. Answer these questions if the location is an NICU: Check Y if patient had a non-umbilical central line during the 48-hour period before event date, otherwise check N.
Umbilical catheter	Check Y if patient had an umbilical catheter during the 48-hour period before event date, otherwise check N.
Birthweight	Required. Enter patient's weight at the time of birth in grams, not the weight on the date of event.

Data Field	Instructions for Data Collection
Location of device insertion	Optional. Enter the patient location where the central line was inserted. • If the patient has more than one central line, enter the location where the first central line was inserted. • If the patient has both a permanent and a temporary central line, enter the location where the temporary line was inserted. • If the patient has both an umbilical and a non-umbilical central line, enter the location where the umbilical line was inserted.
Date of device insertion	Optional. Enter the date the central line was inserted. If the patient has more than one central line, enter the insertion date for the first line that was inserted.
Event Details: Specific event	Required. Check either laboratory-confirmed (LCBI) or clinical sepsis (CSEP) indicating the specific site of this BSI event. NOTE: CSEP may be used only for neonates and infants.
Event Details Specify criteria used:	Required. Check each of the elements of the criterion that was used to identify this infection.
Event Details: Died	Required. Check Y if patient died during the hospitalization, otherwise check N.
Event Details: BSI contributed to death	Conditionally required if patient died. Check Y if the BSI contributed to death, otherwise check N.
Event Details: Discharge date	Optional. Date patient discharged from facility using this format: MM/DD/YYYY.
Event Details: Pathogen identified	Required. Enter Y if pathogen identified, otherwise check N. If Yes, specify pathogen(s) on reverse of form (see Table 2a for instructions). NOTE: If LCBI, this field will be autofilled by the computer as Y. If CSEP, this field will be autofilled by the computer as N.
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields that may be customized for local use. NOTE: Each custom field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter any information on the event.

Table 2a. Instructions for Completion of the Back of the Following Forms: Primary Bloodstream Infection (CDC 57.108); Pneumonia (CDC 57.111); Urinary Tract Infection (CDC 57.114); Surgical Site Infection (CDC 57.120); Dialysis Event (CDC 57.109) ; MDRO and CDAD Infection Event (CDC 57.126)

Data Field	Instructions for Data Collection/Entry
For specified Gram-positive and Gram-negative organisms, Pathogen #	Up to three pathogens may be reported. If multiple pathogens are identified, enter the pathogen judged to be the most important cause of infection as #1, the next most as #2, and the least as #3 (usually this order will be indicated on the laboratory report).
Antimicrobial agent and susceptibility results	Conditionally required if Pathogen Identified = Y. • For those organisms shown on the back of an event form, susceptibility results are required only for the agents listed. • For organisms that are not listed on the back of an event form, enter a susceptibility result for at least one antimicrobial agent, even if that result is "Not Tested". Circle the pathogen's susceptibility result: S – Susceptible, I – Intermediate, R – Resistant, N – Not Tested. Additional antimicrobial agents and susceptibility results may be reported for up to a total of 20 agents.
For Other Organisms, Pathogen #	Up to three pathogens may be reported. If multiple pathogens are identified, enter the pathogen judged to be the most important cause of infection as #1, the next most as #2, and the least as #3 (usually this order will be indicated on the laboratory report).
Antimicrobial agent and susceptibility results	For each pathogen, up to 20 antimicrobial agents and susceptibility results may be reported. Values for susceptibility results are: S – Susceptible, I – Intermediate, R – Resistant, N – Not Tested.

Table 3. Instructions for Completion of the Central Line Insertion Practices Adherence Monitoring Form (CDC 57.125)

Data Field	Instructions for Form Completion
Facility ID	The NHSN-assigned facility ID will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer.
Patient ID	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name: Last, first, middle	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Check Female or Male to indicate the gender of the patient.
Date of Birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity Hispanic or Latino Not Hispanic or Not Latino	Optional. If patient is Hispanic or Latino, check this box. If patient is not Hispanic or not Latino, check this box.
Race (specify)	Optional. Check all the boxes that apply to identify the patient's race.
Event Type	Required. CLIP.
Location	Required. Enter the location of the patient at the time of the central line insertion.
Insertion date	Required. Enter the date of central line insertion (MM/DD/YYYY).
Person recording insertion practice data	Required. Select inserter or observer.
Central line inserter ID	Optional. Enter the HCW ID# of the person inserting the central line.
Name, Last, First	Optional. Enter last name and first name of person inserting the central line.
Occupation of inserter	Required. Check the occupational category of the person inserting the central line Attending physician; Intern/Resident; Physician assistant; IV team; Fellow; Other medical staff; Medical student; Other student. If Other than these, please specify.
Reason for insertion	Required. Check the primary reason for inserting the central line: New indication; Replace malfunctioning central line; Suspected central line-associated infection. If Other, please specify.

Data Field	Instructions for Form Completion
Inserter performed hand hygiene prior to central line insertion	Required. Check Y if the inserter appropriately performed hand hygiene prior to inserting central line; otherwise check N. Appropriate hand hygiene includes the use of alcohol-based hand rub or soap and water hand wash.
Maximal sterile barrier precautions used	Required. Check each sterile barrier used during insertion: Mask, Sterile gown; Large sterile (full body) drape; Sterile gloves; Cap. NOTE: If inserter wore either a mask or a mask with eye shield, the Mask box should be checked
Skin preparation	Required. Check all that apply: Chlorhexidine gluconate; Povidone iodine; Alcohol.
Was skin preparation agent completely dry at time of first skin puncture?	Required. Check Y if the skin prep agent was allowed to dry completely at the time of first skin puncture; otherwise select N.
Insertion site	Required. Check the site of insertion of the central line: Jugular; Subclavian; Umbilical; Femoral; Upper extremity; Lower Extremity; Scalp.
Antimicrobial coated catheter used	Optional. Check Y if antimicrobial coated catheter was used; otherwise check N.
Central line catheter type	Required. Check the type of central line inserted: Non-tunneled catheter (other than dialysis); Tunneled catheter (other than dialysis); Dialysis catheter non-tunneled; Dialysis catheter tunneled; Umbilical; PICC. If other, please specify.
Number of lumens	Required. Circle the number of lumens in the device: 1, 2, 3 or $\geq$ 4.
Central line exchanged over a guidewire	Required. Check Y if the central line was exchanged over a guidewire; otherwise Check N.
Antiseptic ointment applied to site	Required. Check Y if antiseptic was applied to the insertion site following insertion but prior to application of the dressing; otherwise check N.
Custom Fields and Labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields that may be customized for local use. NOTE: Each custom field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter any additional information on the central line insertion.

Table 4. Instructions for Completion of Pneumonia (PNEU) Form (CDC 57.111)

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer.
Patient ID #	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID #	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Check Female or Male to indicate the gender of the patient.
Date ofbirth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity Hispanic or Latino Not Hispanic or Not Latino	Optional. If patient is Hispanic or Latino, check this box. If patient is not Hispanic or not Latino, check this box.
Race	Optional. Check all the boxes that apply to identify the patient's race.
Event type	Required. PNEU.
Date of event	Required. The date when the first clinical evidence of the PNEU appeared or the date the specimen used to make or confirm the diagnosis was collected, whichever comes first. Enter date of this event using this format: MM/DD/YYYY.
Post-procedure PNEU	Required. Check Y if this event occurred after an NHSN defined procedure but before discharge from the facility, otherwise check N.
Date of procedure	Conditionally required. If Post-procedure PNEU = Y, then enter the date the procedure was done.
NHSN procedure code	Conditionally required. Answer this question only if this patient developed the PNEU during the same admission as an operative procedure. Enter the appropriate NHSN procedure code. NOTE: A PNEU cannot be "linked" to an operative procedure unless that procedure has already been added to NHSN. If the procedure was previously added, and the "Link to Procedure" button is clicked, the fields pertaining to the operation will be autoentered

	by the computer.
ICD-9-CM procedure code	Optional. The ICD-9-CM code may be entered here instead of (or in addition to) the NHSN Procedure Code. If the ICD-9-CM code is entered, the NHSN code will be autoentered by the computer. If the NHSN code is entered first, you will have the option to select the appropriate ICD-9-CM code. In either case, it is optional to select the ICD-9-CM code. Only those ICD-9-CM codes identified in Table 10 of the Procedure-associated Module section are allowed.
MDRO infection	Required. Enter "Yes", if the pathogen is being followed for the MDRO/CDAD Module and is part of your Monthly Reporting Plan: MRSA, MSSA (MRSA/MSSA), VRE, MDR-*Klebsiella*, MDR-*Acinetobacter* or *C. difficile*. If the pathogen for this event happens to be an MDRO but your facility is not following the MDRO/CDAD Module in your Monthly Reporting Plan, answer "No" to this question.
Location	Required. Enter the inpatient location to which the patient was assigned when the PNEU was identified. If the PNEU develops in a patient within 48 hours of transfer from a location, indicate the transferring location, not the current location of the patient.
Date admitted to facility	Required. Enter date patient admitted to facility using this format: MM/DD/YYYY.
Risk Factors	
Ventilator	Required. Check Y if the patient with PNEU had a device to assist or control respiration continuously through a tracheostomy or by endotracheal intubation, inclusive of the weaning period, within the 48-hour period before developing infection, otherwise check N.
Birth weight	Conditionally required. If the patient is a NICU patient, enter the patient's birth weight in grams.
Location of device insertion	Optional. Enter the patient location where the intubation and ventilation procedure was performed
Date of device insertion	Optional. Enter the date the intubation and ventilation procedure was performed.
Event Details: PNEU Specific event	Required. Check one: Clinically Defined Pneumonia (PNU1), Pneumonia with specific laboratory findings (PNU2), or Pneumonia in immunocompromised patients (PNU3), whichever criteria are met for this event.
Event Details: Specify criteria used	Required. Check each of the elements that were used to identify this infection.
Event Details: Secondary bloodstream infection	Required. Check Y if there is a culture-confirmed bloodstream infection (BSI) and a related pneumonia, otherwise check N.
Event Details: Died	Required. Check Y if patient died during the hospitalization, otherwise check N.

Event Details: PNEU contributed to death	Conditionally required. If the patient died, check Y if the PNEU contributed to death, otherwise check N.
Event Details: Discharge date	Optional. Date patient discharged from facility.
Event Details: Pathogen identified	Required. Enter Y if Pathogen Identified, N otherwise; if Yes, specify on reverse (See Table 2a for instructions)
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields that may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter any information on the event.

Table 5. Instructions for Completion of Urinary Tract Infection (UTI) Form (CDC 57.114)

Data Field	Instructions for Data Collection/Entry
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer.
Patient ID #	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID #	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Check Female or Male to indicate the gender of the patient.
Date of birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity Hispanic or Latino Not Hispanic or Not Latino	Optional. If patient is Hispanic or Latino, check this box. If patient is not Hispanic or not Latino, check this box.
Race	Optional. Check all the boxes that apply to identify the patient's race.
Event type	Required. UTI.
Date of event	Required. The date when the first clinical evidence of the UTI appeared or the date the specimen used to make or confirm the diagnosis was collected, whichever comes first. Enter date of this event using this format: MM/DD/YYYY.
Post-procedure UTI	Optional. Check Y if this event occurred after an NHSN defined procedure but before discharge from the facility, otherwise check N.
Date of procedure	Conditionally required. If Post-procedure UTI = Y, enter the date the procedure was done.
NHSN procedure code	Conditionally required. If Post-procedure UTI = Y, enter the appropriate NHSN procedure code. NOTE: A UTI cannot be "linked" to an operative procedure unless that procedure has already been added to NHSN. If the procedure was previously added, and the "Link to Procedure" button is clicked, the fields pertaining to the operation will be autoentered by the computer.
ICD-9-CM procedure code	Optional. The ICD-9-CM code may be entered here instead of (or in addition to) the NHSN Procedure Code. If the ICD-9-CM code is entered, the NHSN code will be autoentered by the computer. If the

	NHSN code is entered first, you will have the option to select the appropriate ICD-9-CM code. In either case, it is optional to select the ICD-9-CM code. Only those ICD-9-CM codes identified in Table 10 of the Procedure-associated Module section are allowed.
MDRO infection	Required. Enter "Yes", if the pathogen is being followed for the MDRO/CDAD Module and is part of your Monthly Reporting Plan: MRSA, MSSA (MRSA/MSSA), VRE, MDR-*Klebsiella*, MDR-*Acinetobacter* or *C. difficile*. If the pathogen for this event happens to be an MDRO but your facility is not following the MDRO/CDAD Module in your Monthly Reporting Plan, answer "No" to this question.
Location	Required. Enter the inpatient location to which the patient was assigned when the UTI was identified. If the UTI develops in a patient within 48 hours of transfer from a location, indicate the transferring location, not the current location of the patient.
Date admitted to facility	Required. Enter date patient admitted to facility using this format: MM/DD/YYYY.
Risk factor: Urinary catheter status at time of specimen collection	Required. Check "In place" if urinary catheter was in place at time of urine specimen collection; Check "Removed within 48 hours prior " if a urinary catheter was removed within the 48 hours before urine specimen was collected; Check "Not in place nor within 48 hours prior" if no urinary catheter was in place at the time of or within the 48 hours prior to urine specimen collection.
Location of device insertion	Optional. Enter the patient location where the indwelling urethral catheter was inserted.
Date of device insertion	Optional. Enter the date the indwelling urethral catheter was inserted.
Event details: Specific event: UTI	Required. Check Symptomatic UTI (SUTI), Asymptomatic Bacteremic UTI (ABUTI), or Other UTI (OUTI), for the specific event type you are reporting.
Event details: UTI Specify criteria used	Required. Check each of the elements of the criteria that were used to identify the specific type of UTI being reported.
Event Details: Secondary bloodstream infection	Required. Check Y if there is a culture-confirmed bloodstream infection (BSI) and a related healthcare-associated UTI, otherwise check N.
Event Details: Died	Required. Check Y if patient died during the hospitalization, otherwise check N.
Event Details: UTI contributed to death	Conditionally required. If patient died, check Y if the UTI contributed to death, otherwise check N.
Event Details: Discharge date	Optional. Date patient discharged from facility.
Event Details: Pathogens identified	Required. Enter Y if pathogen identified, N if otherwise. If Y, specify organism name on reverse (See Table 2a for instructions).
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields that may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options

	section of the application before the field can be selected for use.
Comments	Optional. Enter any information on the event.

Table 6. Instructions for the Completion of Denominators for Intensive Care Unit (ICU)/Other locations (Not NICU or SCA) (CDC 57.118)

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Location code	Required. Enter the location code of the unit where you collect the data.
Month	Required. Record the 2-digit month during which the data were collected for this location.
Year	Required. Record the 4-digit year during which the data were collected for this location.
Number of patients	Required. For each day of the month selected, record the number of patients on the unit. Record this number at the same time each day.
Number of patients with 1 or more central lines	Conditionally required. Complete if you have chosen central line-associated bloodstream infection (CLABSI) as an event to follow in your Plan for this month. For each day of the month, at the same time each day, record the number of patients on the selected unit who have 1 or more central lines.
Number of patients with a urinary catheter	Conditionally required. Complete if you have chosen catheter-associated urinary tract infection (CAUTI) as an event to follow in your Plan for this month. For each day of the month, at the same time each day, record the number of patients on the selected unit who have an indwelling urinary catheter.
Number of patients on a ventilator	Conditionally required. Complete if you have chosen ventilator-associated pneumonia (VAP) as an event to follow in your Plan for this month. For each day of the month, at the same time each day, record the number of patients on the selected unit who are on a ventilator.
Total	Required. Totals for each column should be calculated. This is the number that will be entered into the NHSN application.
Label and data fields	Optional. Up to five numeric fields may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options section of NHSN before the field can be selected for use.

Table 7. Instructions for Completion of the Denominators for Specialty Care Area (SCA) (CDC 57.117)

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer
Location code	Required. Enter the location code of the unit where you collect the data.
Month	Required. Record the 2-digit month during which the data were collected for this location.
Year	Required. Record the 4-digit year during which the data were collected for this location.
Number of patients	Required. For each day of the month selected, record the number of patients on the unit. Record this number at the same time each day.
Number of patients with 1 or more central lines	Conditionally required. Complete if you have chosen central line-associated bloodstream infection (CLABSI) as an event to follow in your Plan for this month.
Temporary	For each day of the month, at the same time each day, record the number of patients on the selected unit who have 1 or more non-tunneled central lines.
Permanent	For each day of the month, at the same time each day, record the number of patients on the selected unit who have 1 or more tunneled or implanted central lines beginning on the first day the permanent line was accessed and continuing through the entire stay. NOTE: If a patient has both a temporary and a permanent line in place, count only the temporary line.
Number of patients with a urinary catheter	Conditionally required. Complete if you have chosen catheter-associated urinary tract infection (CAUTI) as an event to follow in your Plan for this month. For each day of the month, at the same time each day, record the number of patients on the selected unit who have an indwelling urinary catheter.
Number of patients on a ventilator	Conditionally required. Complete if you have chosen ventilator-associated pneumonia (VAP) as an event to follow in your Plan for this month. For each day of the month, at the same time each day, record the number of patients on the selected unit who are on a ventilator.
Total	Required. Totals for each column should be calculated. This is the number that will be entered into the NHSN application.
Label and data fields	Optional. Up to five numeric fields may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options section of NHSN before the field can be selected for use.

Table 8. Instructions for Completion of the Denominators for Neonatal Intensive Care Unit (NICU) (CDC 57.116)

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Location code	Required. Enter the location code of the unit where you collect the data.
Month	Required. Record the 2-digit month during which the data were collected for this location.
Year	Required. Record the 4-digit year during which the data were collected for this location.
Number of patients (Pts)	Required. For each day of the month selected, record the number of patients in each birthweight category on the unit. Record this number at the same time each day.
Number of patients with each of the following:	Conditionally required. Complete if you have chosen central line-associated bloodstream infection (CLABSI) as an event to follow in your Plan for this month for this unit. If you choose to monitor CLABSI in the NICU population, you must collect data for both umbilical catheters and for non-umbilical central lines.
Umbilical catheter (U/C)	For each day of the month, at the same time each day, record the number of patients in each birthweight category on the selected unit who have an umbilical catheter in place.
Non-umbilical central line (CL)	For each day of the month, at the same time each day, record the number of patients in each birthweight category on the selected unit who have 1 or more non-umbilical central line(s) in place. NOTE: If an infant has both an umbilical catheter and a non-umbilical central line, count as an umbilical catheter day only.
Number of patients on a ventilator (VNT)	Conditionally required. Complete if you have chosen ventilator-associated pneumonia (VAP) as an event to follow in your Plan for this unit for this month. For each day of the month, at the same time each day, record the number of patients in each birthweight category on the selected unit who are on a ventilator.
Total	Required. Totals for each column should be calculated. This is the number that will be entered into the NHSN application.
Label and data fields	Optional. Up to five numeric fields may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options section of NHSN before the field can be selected for use.

Table 9. Instructions for Completion of Dialysis Event (DE) form (CDC 57.109)

Data Field	Instructions for Completion
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Event ID #	Event ID # will be autoentered by the computer.
Patient ID #	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID #	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first and middle name of the patient.
Gender	Required. Check Female or Male to indicate the gender of the patient.
Date of birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity Hispanic or Latino Not Hispanic or Not Latino	Optional. If patient is Hispanic or Latino, check this box. If patient is not Hispanic or not Latino, check this box.
Race	Optional. Check all the boxes that apply to identify the patient's race.
Event type	Required. Enter DE.
Date of event	Required. Depending on the type of incident reported, enter either the date of hospitalization, or date of in-unit IV antimicrobial start, or for a patient, whose incident is a positive blood culture, enter the date the blood specimen was collected. Enter date of this-event using this format: MM/DD/YYYY.
Location	Required. Enter the location code of the outpatient dialysis unit where the patient was at the time of the DI.
Risk Factor: Vascular access type	Required. Check each access that the patient has.
Event Details: DI Incident type	Required. Check one or more of the incident types below: • Check Hospitalization if patient stayed overnight in a hospital, not just those related to infections or those where patient was directly admitted from the dialysis unit. Each time a patient is hospitalized, enter it as a new event. If a patient is hospitalized and returns to the dialysis unit on IV antimicrobials, both will be included in the same event – do not enter a second event. • Check In-unit IV antimicrobial start if patient is given IV

	antimicrobial agents in the dialysis unit for any reason, not just those with vancomycin or for a vascular access problem. If IV antimicrobials are stopped for less than 21 days and then restarted, this is NOT considered a new event. However, if IV antimicrobials are stopped for 21 or more days and then restarted, this is considered a new event • Check Positive blood culture if the patient blood culture is positive, even if they did not have an associated hospitalization or in-unit IV antimicrobial start. Include blood cultures taken as an outpatient or within 1 day after a hospital admission. If the patient had an associated hospitalization or in-unit IV antimicrobial start, use the appropriate rule (above) for entering the event; if the patient had neither, enter a new event for positive blood culture occurring 21 or more days after ~~the first~~ a previous positive blood culture.
Problem (s)	Required. For each syndrome listed, check if present.
Pus, redness, or increased swelling at the vascular access site	Check if symptoms present. Do not check this if the patient is thought to have an access infection, but does not have the signs listed. Instead check "Other" and specify "Possible access infection." Similar rule for other responses: If the patient is thought to have the problem but does not meet the criteria, check "Other."
If applicable, check the access with pus, redness, or increased swelling:	If applicable, check one of the following: __ graft __ fistula __ temporary central line __ permanent central line __ port access device
Blood culture	Required. Check positive, negative, unknown, or not done. This applies only to blood cultures.
If positive, suspected source of positive blood culture	Conditionally required. If blood culture is positive, check "Vascular access" only if there is some objective evidence of vascular access infection. Check "A source other than the vascular access" if either (a) or (b) is true: (a) a culture from another site (e.g., leg wound, urine) shows the same organism found in the blood; (b) there is clinical evidence of infection at another site, but a culture was not taken from it. Check "Contamination" if the organism is thought by the physician, infection control practitioner, or head nurse to be a contaminant. Contamination is more likely if a common skin contaminant (e.g., coagulase negative staphylococci, diphtheroids,

	Propionibacterium, or *Bacillus* spp.) is isolated from only one blood culture. Check "Uncertain" if there is insufficient evidence to decide among the three previous categories.
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields may be customized for local use (optional). NOTE: Each Custom Field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter any information on the Event. This information may not be analyzed.

Table 10. Instructions for completion of Denominators for Outpatient Dialysis: Census Form (CDC 57.119)

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Location code	Required. Enter the location code for the outpatient dialysis location from which you will collect data about dialysis incidents.
Month	Required. Record the 2-digit month during which the data were collected for this location.
Year	Required. Record the 4-digit year during which the data were collected for this location.
Number of chronic hemodialysis patients	Required. For each type of vascular access listed, record the number of patients who received hemodialysis at this location during the first two working days of the month. Record each patient only once. If a patient has both an implanted access (graft or fistula) and a temporary central line, record the temporary central line.
Total patients:	Required. Add the numbers from the column.
Label and data fields:	Optional. Up to five numeric fields may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options section of NHSN before the field can be selected for use.

Table 11. Instructions for completion of the AUR Option Forms (CDC 57.123 and CDC 57.124)

Data Field	Instructions for Data Collection
Fields common to both forms:	
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Month	Required. Record the 2-digit month during which the data were collected for this location.
Year	Required. Record the 4-digit year during which the data were collected for this location.
Location	Required. Enter hospital area specification; must be an intensive care unit (ICU/SCA), combined inpatient non-ICU/SCA area, or combined outpatient area as defined below: Intensive Care Unit (ICU): An ICU is defined in the NHSN as a patient care area that provides intensive observation, diagnosis, and therapeutic procedures for critically ill patients. This designation excludes units that provide step-down care, intermediate care, or telemetry and in this module cannot include pediatric locations. Specialty Care Area (SCA): An SCA is a patient care area in which 80% of patients are of the following types: Bone marrow transplant patients Solid organ transplant patients Patients with hematologic or oncologic malignancies Patients receiving peritoneal or hemodialysis Patients in long-term acute care units In this module SCA cannot include pediatric locations. Inpatient Non-ICU/SCA: An inpatient non-ICU/SCA location is a patient care area that houses NHSN patient inpatients (i.e., those patients whose date of admission and discharge are different). These areas do not provide intensive care or specialty care as defined above. Examples of inpatient non-ICU/SCA locations are general medicine and general surgery wards. The data from these areas are combined and reported as a single entity. Outpatient: An outpatient location is an area in which patients are ordinarily admitted and discharged on the same day. Examples of outpatient care include same day surgery, evaluations and screening, and urgent or emergent care. Many diagnostic or therapeutic procedures may be delivered in these locations, such as mammography, cardiac catheterization, or administration of chemotherapy. The data from these areas are combined and reported as a single entity.

AUR Microbiology Laboratory Data Form (CDC 57.123)	
No duplicate isolates or surveillance cultures are included when reporting monthly counts of organisms and their susceptibilities. (Ref: Clinical Laboratory Standards Institute (CLSI)(formerly National Committee for Clinical Laboratory Standards [NCCLS])) Duplicate isolate: An isolate of the same species of bacteria, regardless of antimicrobial susceptibility pattern, in the same patient, regardless of specimen site, during a given reporting period. For AUR, the reporting period is one month. Do not count duplicate isolates. Surveillance cultures: Those cultures performed as part of infection control surveillance, such as stool cultures for vancomycin-resistant enterococci (VRE).	
Data Field	**Instructions for Data Collection**
Susceptible (S) Intermediate (I) Resistant (R)	Required. Record the number of bacterial isolates that are classified as susceptible (S), intermediate (I), and resistant (R) (as defined by CLSI) by minimum inhibitory concentration (MIC) or disc diffusion tested to the antimicrobial agents shown on the form. If testing is not performed on any of the agents listed, enter a zero in each field (S, I, R).
Total tested	Required. The number of each bacterial species that were tested for susceptibility to each of the corresponding antimicrobial agents during a given month. The total must be equal to the S, I, and R numbers recorded.
AUR Pharmacy Data Form (CDC 57.124)	
Pharmacy data are reported monthly for inpatient locations only; do not report outpatient data.	
Data Field	**Instructions for Data Collection**
Patient days	Required. Total number of days when patients were hospitalized.
Parenteral antibiotics quantity used	Required. Record the total number of grams or millions of units (mill. I.U.) of each parenteral antimicrobial agent delivered to the inpatient care location shown at the top of the form.
Oral antibiotics, quantity used	Required. Record the total number of grams (g) of each oral antimicrobial agent delivered to the inpatient care location shown at the top of the form for the month. If the antimicrobial agent is not on your formulary or none was used, enter a zero. For combination drugs, enter grams for the drug marked with an asterisk (*).

Table 12. Instructions for completion of the Surgical Site Infection (SSI) Form (CDC 57.120)

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer.
Patient ID #	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID #	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Check Female or Male to indicate the gender of the patient.
Date of birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity Hispanic or Latino Not Hispanic or Not Latino	Optional. If patient is Hispanic or Latino, check this box. If patient is not Hispanic or not Latino, check this box.
Race	Optional. Check all the boxes that apply to identify the patient's race.
Event type	Required. Enter SSI.
Date of event	Required. The date when the first clinical evidence of the SSI appeared or the date the specimen used to make or confirm the diagnosis was collected, whichever comes first. Enter date of this event using this format: MM/DD/YYYY.
NHSN procedure code	Required. Enter the appropriate NHSN procedure code. NOTE: An SSI cannot be "linked" to an operative procedure unless that procedure has already been added to NHSN. If the procedure was previously added, and the "Link to Procedure" button is clicked, the fields pertaining to the operation will be autoentered by the computer.
Date of procedure	Required. Enter date using this format: MM/DD/YYYY.
ICD-9-CM procedure code	Optional. The ICD-9-CM code may be entered here instead of (or in addition to) the NHSN Procedure Code. If the ICD-9-CM code is entered, the NHSN code will be autoentered by the computer. If the NHSN code is entered first, you will have the option to select the appropriate ICD-9-CM code. In either case, it is optional to select the ICD-9-CM code. Only ICD-9-CM codes in Table 10 of the Procedure-associated Module section are allowed.
MDRO infection	Required. Enter "Yes", if the pathogen is being followed for the MDRO/CDAD Module and is part of your Monthly Reporting Plan: MRSA, MSSA (MRSA/MSSA), VRE, MDR-*Klebsiella*, MDR-*Acinetobacter* or *C. difficile*. If the pathogen for this event happens to be an MDRO but your facility is not

	following the MDRO/CDAD Module in your Monthly Reporting Plan, answer "No" to this question.
Location	Required. Enter the patient care area where the patient was assigned in the postoperative period. Inpatient or outpatient locations are allowed, but Operating Room locations are not allowed.
Date admitted to facility	Required. Enter date patient admitted to facility using this format: MM/DD/YYYY. If a patient is readmitted with a previously unreported event that was acquired during a preceding admission, enter the date of admission of the facility stay in which the event was acquired.
Event details specific event SSI	Required. Check the appropriate level of SSI from the list ___Superficial incisional primary (SIP) ___Superficial incisional secondary (SIS) ___Deep incisional primary (DIP) ___Deep incisional secondary (DIS) ___Organ/space: __(indicate specific site code from table shown in organ/space SSI definition)
Event details: SSI Specify criteria used	Required. Check each of the elements of the definition that were used to identify the specific type of SSI. Specific Organ/space event types have their own unique criteria which must be met. They are found in Table 17.
Event details: Detected	Required. Check A if SSI was identified before the patient was discharged from the facility following the operation. Check P if SSI was identified during post-discharge surveillance. Include as P those SSI identified by another facility (i.e., patient with SSI was admitted to a facility other than the one in which the operation was performed). Check R if SSI was identified due to patient readmission to the facility where the operation was done.
Event Details: Secondary bloodstream infection	Required. Check Y if there is a culture-confirmed bloodstream infection (BSI) and a related healthcare-associated infection at the surgical site, otherwise check N.
Event details: Died	Required. Check Y if patient died during the hospitalization, otherwise check N.
Event Details: SSI contributed to death	Conditionally required. If patient died, check Y if the SSI contributed to death, otherwise check N.
Event Details: Discharge date	Optional. Enter date patient discharged from facility using this format: MM/DD/YYYY. If a patient is readmitted with a previously unreported event that was acquired during a preceding admission, enter the date of discharge of the facility stay in which the event was acquired.
Event Details: Pathogens identified	Required. Enter Y if Pathogen Identified, N if otherwise. If Y, specify organism name on reverse. See Table 2a above for instructions.
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options section

	of the application before the field can be selected for use.
Comments	Optional. Enter any information on the event.

Table 13. Instructions for Completion of the Denominator for Procedure form (CDC 57.121)

This form is used for reporting data on each patient having one of the NHSN operative procedures selected for monitoring.	
Data Field	**Instructions for Data Collection**
Facility ID #	The NHSN-assigned facility ID will be autoentered by the computer.
Procedure #	The NHSN-assigned Procedure # will be autoentered by the computer
Patient ID #	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID #	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Check Female or Male to indicate the gender of the patient.
Date of birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity Hispanic or Latino Not Hispanic or Not Latino	Optional. If patient is Hispanic or Latino, check this box. If patient is not Hispanic or not Latino, check this box.
Race	Optional. Check all the boxes that apply to identify the patient's race.
Event type	Required. Enter the code for procedure (PROC).
NHSN Procedure code	Required. Enter the appropriate NHSN procedure code.
ICD-9-CM procedure code	Optional. The ICD-9-CM code may be entered here instead of (or in addition to) the NHSN Procedure Code. If the ICD-9-CM code is entered, the NHSN code will be autoentered by the computer. If the NHSN code is entered first, you will have the option to select the appropriate ICD-9-CM code. In either case, it is optional to select the ICD-9-CM code. Only those codes listed in Table 10 of the Procedure-associated Module section are allowed.

Date of procedure	Required. Record the date when the NHSN procedure was done using this format: MM/DD/YYYY.
Procedure Details:	
Outpatient:	Required. Check Y if this operative procedure was performed on an outpatient, otherwise check N.
Duration:	Required. Enter the interval in hours and minutes between the skin incision and skin closure.
Wound class:	Required. Check the appropriate wound class from the list.
General anesthesia:	Required. Check Y if general anesthesia was used for the operative procedure, otherwise check N.
ASA class:	Required. Check numeric ASA classification at the time of the operative procedure.
Emergency:	Required. Check Y if this operative procedure was a nonelective, unscheduled operative procedure, otherwise check N.
Trauma:	Required. Check Y if operative procedure was performed because of blunt or penetrating traumatic injury to the patient, otherwise check N.
Endoscope:	Required. Check Y if the entire operative procedure was performed using an endoscope/laparoscope, otherwise check N. NOTE: For CBGB, if the donor vessel was harvested using an endoscope, check Y.
Multiple procedures:	Required. Check Y if more than one category of NHSN operative procedure was performed through the same incision during the same trip to the operating room, otherwise check N.
Surgeon code:	Optional. Enter code of the surgeon who performed the principal operative procedure.
Implant :	Required. Check Y if a nonhuman-derived object, material, or tissue was permanently placed in a patient during the operative procedure and will not be routinely manipulated for diagnostic or therapeutic purposes. Otherwise check N

Non-autologous Transplat :	Required. Check Y if human cells, tissues, organs, or cellular- or tissue-based products that derived from another human body, either a donor cadaver or a live donor, were placed into a human recipient via grafting, infusion, or transfer. Otherwise check N.
CSEC: Height	Conditionally required. If operative procedure is CSEC, enter patient height in feet and inches or meters and centimeters.
CSEC: Weight	Conditionally required. If operative procedure is CSEC, enter patient weight in pounds or kilograms.
CSEC: Duration of labor	Conditionally required. If operative procedure is CSEC, enter hours patient labored in the hospital prior to operative procedure.
CSEC: Estimated blood loss	Conditionally required. If operative procedure is CSEC, enter the estimated blood loss in ml.
Circle one: FUSN RFUSN	Conditionally required. If operative procedure is FUSN or RFUSN, circle the procedure that was done.
FUSN/RFUSN: Spinal level	Conditionally required. If operative procedure is FUSN or RFUSN, check appropriate spinal level of procedure from list. • Atlas-Axis – C1-C2 only • Atlas-Axis/Cervical – C1-C7 (any combination) • Cervical – C3-C7 (any combination) • Cervical/Dorsal/Dorsolumbar – Extends from any cervical through any lumbar levels • Dorsal/dorsolumbar – T1 – L5 (any combination) • Lumbar/Lumbosacral – L1-S5 (any combination) • Not specified – Level not specified
FUSN/RFUSN: Diabetes mellitus	Conditionally required. If operative procedure is FUSN or RFUSN, check Y if patient is known to have diabetes mellitus, otherwise check N.
FUSN/RFUSN: Approach/Technique	Conditionally required. If operative procedure is FUSN or RFUSN, check appropriate surgical approach or technique from list.
HPRO:	Conditionally required. If operative procedure is HPRO, select TP (Total Primary), PP (Partial Primary), TR (Total Revision) or PR (Partial Revision) from the list.
KPRO:	Conditionally required. If operative procedure is KPRO, select T – Primary (Total), R – Revision (Total or Partial) from list.
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields may be customized for local use.

Table 14. Instructions for completion of High Risk Inpatient Influenza Vaccination (HRIIV) Monthly Monitoring Form – Method A (57.130)

Data Field	Instructions for Data Collection
Facility ID	The NHSN-assigned facility ID number will be autoentered by the computer.
Vaccination type	Influenza
Month	Required. Record using this format: MM
Year	Required. Record using this format: YYYY
1. Total # of patient admissions	Required. Total number of inpatient admissions during the month being reviewed.
2. Total # of patients meeting high risk criteria for influenza vaccination	Required. Total number of patients meeting high risk criteria during the month being reviewed.
3. Total # of patients previously vaccinated during current influenza season	Optional. Total number previously vaccinated during current influenza season.
4. Total # of patients meeting high risk criteria previously vaccinated during current influenza season	Required. Total number of patients meeting high risk criteria previously vaccinated during current influenza season during period evaluated.
5. Total high risk patients not previously vaccinate during current influenza season (Denominator: Box 2 - Box 4)	Required. Subtract total number in Box 4 from number in Box 2.
6. Patients meeting high risk criteria offered vaccination but declining for reasons other than medical contraindication	Required. Total number of patients meeting high risk criteria offered vaccination but declining for reasons other than medical contraindication.
7. Patients meeting high risk criteria offered vaccination but having medical contraindication	Required. Total number of patients meeting high risk criteria offered vaccination but having medical contraindication.
8. Patients meeting high risk criteria receiving vaccination during admission	Required. Total number of patients meeting high risk criteria who receive influenza vaccination during their admission.
9. Total patients offered vaccination for high risk criteria	Required. Total of boxes 6, 7 and 8.
Label and data fields:	Optional. Up to five label and five corresponding custom data fields are available for local use and the values entered. These fields may be analyzed.

Table 15. Instructions for Completion of the High Risk Inpatient Influenza Vaccination Monthly Monitoring Form – Method B (CDC 57.132)

Data Field	Instructions for Data Collection
Facility ID	The NHSN-assigned facility ID number will be autoentered by the computer.
Vaccination type	Influenza
Month	Required. Record using this format: MM
Year	Required. Record using this format: YYYY
1. Total # of patient Admissions	Required. Total number of inpatient admissions of greater than 24 hours during the month being reviewed.
2. Total # of patients previously vaccinated during current influenza season	Optional. Total number previously vaccinated during current influenza season.
3. Total # of patients meeting high risk criteria previously vaccinated during current influenza season	Required. Total number meeting high risk criteria that were previously vaccinated during current influenza season.
Label and data fields:	Optional. Up to five label and five corresponding custom data fields are available for local use and the values entered. These fields may be analyzed.

Table 16. Instructions for completion of the High Risk Inpatient Influenza Vaccination Method B Form – Part 1 (CDC 57.133)

Data Field	Instructions for Data Collection
Facility ID	The NHSN-assigned facility ID number will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer.
Patient ID	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Circle F (Female) or M (Male) to indicate the gender of the patient.
Date of birth	Required. Record the date of the patient birth using this format: M/DD/YYYY.
Ethnicity	Optional. Indicate the patient's ethnicity: Hispanic or Latino Not Hispanic or Not Latino
Race	Optional. Indicate the patient's race (all that apply): American Indian or Alaskan Native Asian Black or African American Native Hawaiian or Other Pacific Islander White
Event type	FLUVX
Vaccination type	Influenza
Date of admission	Required. Record the date of the patient admission using this format: MM/DD/YYYY.
High risk criteria	Required. Check all high risk criteria that apply.
Vaccine offered	Required. Check Yes or No. If Yes proceed to HRIIV Method B Form – Part 2, CDC 57.131.
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields may be customized for local use. NOTE: Each custom Field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.

Comments	Optional. Enter comments about this vaccination. These fields can not be analyzed.
Table 1 - ICD9-CM codes potentially associated with high risk disease conditions	Conditionally required. If patient has any diagnosis or history of any procedure associated with ICD-9-CM codes listed in Table 1 in Standing Orders Form check all that apply

Table 17. Instructions for completion of the High Risk Inpatient Influenza Vaccination Method B Form – Part 2 (CDC 57.131)

Data Field	Instructions for Data Collection
Facility ID	The NHSN-assigned facility ID number will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer
Patient ID	Required. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID	Optional. Enter the alphanumeric ID number assigned by the facility.
Patient name	Optional. Enter the last, first, and middle name of the patient.
Gender	Required. Circle F (Female) or M (Male) to indicate the gender of the patient.
Date of birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY
Ethnicity	Optional. Indicate the patient's ethnicity: Hispanic or Latino Not Hispanic or Not Latino
Race	Optional. Indicate the patient's race (all that apply): American Indian or Alaskan Native Asian Black or African American Native Hawaiian or Other Pacific Islander White
Event type	FLUVX
Vaccination type	Influenza
Vaccine offered	Required. Check Yes or No
Vaccine declined	Required. Check Yes or No
Reason(s) vaccine declined A. Medical contraindication B. Personal reason(s) for declining	Conditionally Required. If patient declined influenza vaccination, Check all that apply in either section A or section B but not both. If reasons exist in both categories then section A, medical contraindications, takes priority and should be completed.

Vaccine administered	Required. Check Yes or No
Date vaccine administered	Conditionally required. If vaccine administered indicate date given using this format: MM/DD/YYYY
Type of influenza vaccine administered	Conditionally required. If vaccine administered, indicate name of vaccine and either Live attenuated vaccine or inactivated vaccine.
Manufacturer	Conditionally required. If vaccine administered, influenza vaccine manufacturer will be autoentered by computer when vaccine type is selected.
Lot number	Conditionally required. If vaccine administered, enter the lot number of the vaccine given to the patient.
Route of administration	Conditionally required. If vaccine is administered, indicate the route of administration used.
Vaccine information Statement Provided	Conditionally required. If vaccine is administered, indicate what type of information statement was provided, if any, and the edition date using this format: MM/DD/YYYY
Person administering vaccine: Vaccinator ID	Optional. If vaccine is administered, indicate vaccinator identifier. This is the vaccinator identifier assigned by the hospital and may consist of any combination of numbers and/or letters.
Person administering vaccine: Title	Optional. If vaccine is given indicate title of person administering vaccine (RN, LPN, Nurses Assistant, etc.).
Person administering vaccine: Name	Optional. If vaccine is given indicate name of vaccinator by last name, first name, middle name or initial
Person administering vaccine: Work address	Optional. If vaccine is given indicate address of location where vaccine was given. This should be the hospital address in most cases.
Custom fields and labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields may be customized for local use. NOTE: Each custom Field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter comments about this vaccination. These fields can not be analyzed.

Table 18. Instructions for Completion of the High Risk Inpatient Influenza Vaccination Standing Orders Form - Optional (CDC 57.134)

Data Field	Instructions for Data Collection
Facility ID	Required. Blank space for facility to place identification information of the facility as indicated or required by the facility.
Patient ID	Required. Blank space for facility to place patient identification label or stamp as indicated. Minimum information required includes the alphanumeric patient ID number (This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters), gender and date of birth.
High risk inclusion criteria	Required. Check all that apply.
Prior influenza vaccination during current influenza season (OCT – MAR) by documentation or history	Required. Check Yes or No
Vaccine offered	Required. Check Yes or No
Vaccine declined	Required. Check Yes or No
Reason(s) vaccine declined	Conditionally required. Check all that apply in either section A or section B but not both. If reasons exist in both categories then section A, medical contraindications, takes priority and should be completed.
Orders	Required. Check Immunize or DO NOT Immunize.
Standing order	Optional. Check if hospital policy provides for standing immunization order.
Physicians signature	Conditionally required. Signature of ordering physician if standing order policy is not in place and checked.
Vaccine administered	Required. Check Yes or No
Type of influenza vaccine administered	Conditionally required. If vaccine administered indicate type of vaccine administered, manufacturer and lot number.
Route of administration	Conditionally required. If vaccine administered indicate route used.
Vaccine information statement provided to patient	Conditionally required. If vaccine administered indicate type and edition date of vaccine information statement provided, if no vaccine information statement was provided or if it is unknown.
Vaccinator ID	Conditionally required. If vaccine administered indicate ID number of person administering the vaccine. This could be the employee number of the vaccinator or a vaccinator ID assigned by the hospital and may consist of any combination of numbers and/or letters.
Name	Conditionally required. If vaccine administered indicate name of person administering the vaccine using last name first, followed by first and middle name.

Work address, city, state, zip code	Conditionally required. If vaccine administered indicate work address of person administering the vaccine. Typically this would be the same as the hospital facility.
Table 1 - ICD9-CM codes potentially associated with high risk disease conditions	Conditionally required. If patient has any diagnosis or history of any procedure associated with ICD9-CM codes listed in Table 1 check all that apply.

Table 19. Instructions for Completion of the Laboratory-identified MDRO or CDAD Event form (CDC 57.128)

Data Field	Instructions for Form Completion
Facility ID	The NHSN-assigned facility ID number will be autoentered by the computer.
Event #	Event ID number will be autoentered by the computer.
Patient ID	Required. Enter the alphanumeric patient ID. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters. This should be an ID that remains the same for the patient across all visits and admissions.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID	Optional. Enter any other patient ID assigned by the facility.
Patient Name, Last First, Middle	Optional. Enter the name of the patient. If available, data will be autoentered from Patient Form.
Gender	Required. Circle M (Male) or F (Female) to indicate the gender of the patient.
Date of Birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity (specify)	Optional. Enter the patient's ethnicity: Hispanic or Latino Not Hispanic or Not Latino
Race (specify)	Optional. Enter the patient's race: Select all that apply. American Indian or Alaska Native Asian Black or African American Native Hawaiian or Other Pacific Islander White
Event Details	
Event Type	Required. Event type = LabID.
Date Specimen Collected	Required. Enter the date the specimen was collected for this event using format: MM/DD/YYYY
Specific Organism Type	Required. Check the pathogen identified for this specimen for one of the following laboratory-identified MDRO types: MRSA, MSSA (if tracking MRSA & MSSA), VRE, MDR-*Klebsiella*, MDR-*Acinetobacter* or *C. difficile*. Use one form per LabID event (i.e., 1 form for each pathogen).
Outpatient	Required. Circle "Yes" if the patient meets the definition of an NHSN Outpatient: A patient whose date of admission to the healthcare facility and date of discharge are the same day. If the patient was an outpatient, do not enter Date Admitted to Facility, Location, or Date Admitted to Location.
Specimen Source	Required. Enter the type of material or anatomic site from which the specimen was taken using the source description that is most specific. (e.g.,

Data Field	Instructions for Form Completion
	sputum, blood, nasal cavity, breast abscess, wound, etc.)
Date Admitted to Facility	Conditionally required. Enter the date the patient was admitted to facility using this format: MM/DD/YYYY. If the patient was OP only and not admitted, leave this blank.
Location	Conditionally required. Enter the patient care area where the patient was assigned when the laboratory-identified MDRO or *C. difficile* event occurred even if the patient had just been transferred from another part of the facility (i.e., the NHSN "transfer rule" does not apply for LabID events).
Date Admitted to Location	Conditionally required. Enter the date the patient was admitted to the patient care area where laboratory-identified monitoring is being performed and where the event was identified in the patient.
Documented prior evidence of infection or colonization with this specific organism type?	Required. Circle "Yes" or "No" depending on whether there is prior evidence as documented by a healthcare provider or laboratory report that the patient had a specimen that was positive for the same specific organism type (includes flags for 'known positive'). Statements from the patient should not be treated as documented evidence. If there is a previous LabID event for this organism type entered in NHSN in a prior month, the system will auto-populate with a "Yes." **Do not answer this question if organism type is MSSA.**
Required for CDAD (Optional for Other MDROs)	
Has patient been discharged from your facility in the past 3 months?	Conditionally Required. Circle "Yes" if the patient has been an inpatient and discharged from your facility in the past three months, otherwise circle "No".
Date of last discharge from your facility	Conditionally Required. If the patient was discharged from your facility in the past 3 months (previous question is circled "Yes"), enter the most recent date of discharge prior to the current admission. Use format: MM/DD/YYYY
Custom Fields	
Labels	Optional. Up to two date fields, 2 numeric and 10 alphanumeric fields that may be customized for local use. NOTE: Each Custom Field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter any information on the Event. This information may not be analyzed.

Table 20. Instructions for Completion of the MDRO or CDAD Infection Event form (CDC 57.126)

Data Field	Instructions for Form Completion
Facility ID	The NHSN-assigned facility ID number will be autoentered by the computer
Event #	Event ID number will be autoentered by the computer
Patient ID	Required. Enter the alphanumeric patient ID. This is the patient identifier assigned by the hospital and may consist of any combination of numbers and/or letters. This should be an ID that remains the same for the patient across all visits and admissions.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID	Optional. Enter any other patient ID assigned by the facility.
Patient Name, Last First Middle	Optional. Enter the name of the patient.
Gender	Required. Circle M (Male) or F (Female) to indicate the gender of the patient.
Date of Birth	Required. Record the date of the patient birth using this format: MM/DD/YYYY.
Ethnicity (specify)	Optional. Enter the patient's ethnicity: Hispanic or Latino Not Hispanic or Not Latino
Race (specify)	Optional. Enter the patient's race: (select all that apply) American Indian or Alaska Native Asian Black or African American Native Hawaiian or Other Pacific Islander White
Event Details	
Event Type	Required. Enter infection event type other than BSI, DE, Pneumonia, SSI, or UTI. For reporting MDRO infections that are BSI, Pneumonia, SSI, or UTI, use those infection forms and instructions.
Date of Event	Required. Enter the date the first clinical symptoms of infection occurred or the date the first positive specimen was collected, whichever came first. Use format: MM/DD/YYYY.
Post Procedure Event	Required. Circle "Yes" if the infection occurred after an NHSN-defined procedure but before discharge from the facility, otherwise circle "No".
Date of Procedure	Conditionally required. If an NHSN-defined procedure was performed, enter date using this format: MM/DD/YYYY
MDRO/CDAD Infection	Required. Enter "Yes", if the pathogen is being followed for the MDRO/CDAD Module and is part of your Monthly Reporting Plan: MRSA, MSSA (MRSA/MSSA), VRE, MDR-*Klebsiella*, MDR-*Acinetobacter* or *C. difficile*.

Data Field	Instructions for Form Completion
	If the pathogen for this event happens to be an MDRO but your facility is not following the MDRO/CDAD Module in your Monthly Reporting Plan, answer "No" to this question.
NHSN Procedure code	Conditionally required. Answer this question only if this patient developed the MDRO or *C. difficile* infection during the same admission as an operative procedure. Enter the appropriate NHSN procedure code. NOTE: An MDRO infection cannot be "linked" to an operative procedure unless that procedure has already been added to NHSN. If the procedure was previously added, and the "Link to Procedure" button is clicked, the fields pertaining to the operation will be autoentered by the computer.
ICD-9-CM Procedure Code	Optional. The ICD-9-CM code may be entered here instead of (or in addition to) the NHSN Procedure Code. If the ICD-9-CM code is entered, the NHSN code will be autoentered by the computer. If the NHSN code is entered first, you will have the option to select the appropriate ICD-9-CM code. In either case, it is optional to select the ICD-9-CM code.
Specific Organism Type	Required. Check the pathogen(s) identified for this infection event. You may select up to 3.
Date Admitted to Facility	Required. Enter date patient admitted to facility using this format: MM/DD/YYYY
Location	Required. Enter the nursing care area where the patient was assigned when the MDRO or *C. difficile* infection (CDI) was acquired. If the MDRO or CDI developed in a patient within 48 hours of discharge from a location, indicate the discharging location, not the current location of the patient.
Specific Event Type	Required. List the specific CDC-defined infection event type. For event type = BSI, PNEU, SSI or UTI this form should not be used. Use the form designed for that event.
Signs & Symptoms	Required. Using the criteria in Table 17, check all signs and symptoms observed in the patient that were used to confirm the diagnosis of this infection event.
Laboratory or Diagnostic Testing	Conditionally required. Indicate whether any blood cultures, other laboratory tests or radiologic exams were used to diagnose the infection.
***Clostridium difficile*-Associated Disease**	
Admitted to ICU for CDAD complications	Conditionally required. If pathogen is *C. difficile*, circle "Yes" to indicate admission to ICU for *C. difficile* complications (e.g., shock that requires vasopressor therapy), otherwise circle "No".
Surgery for CDAD complications	Conditionally required. If pathogen is *C. difficile*, circle "Yes" to indicate surgery for *C. difficile* complications, otherwise circle "No". Surgery might include colectomy for toxic megacolon, perforation or refractory colitis.
Secondary Bloodstream Infection	Required. Circle "Yes" if there is a culture-confirmed bloodstream infection (BSI) during this admission, secondary to this infection, for the same pathogen. Otherwise circle "No".
Died	Required. Circle "Yes" if the patient died during this hospitalization, otherwise circle "No".

Data Field	Instructions for Form Completion
Event Contributed to Death	Conditionally Required. **MDRO**: If the patient died during this admission, circle "Yes" if the MDRO infection contributed to death, otherwise circle "No". **CDAD:** Circle "Yes" only if the patient died within 30 days after *C. difficile* infection symptom onset and during the current hospital admission.
Discharge Date	Optional. Enter the date the patient was discharged from the facility using this format: MM/DD/YYYY. If the patient died during this admission enter the death date.
Pathogens Identified	Required. Circle "Yes" if pathogen identified, "No" if otherwise; if "Yes" indicate the pathogen identified on the antibiogram on page 2. If the pathogen was *C. difficile,* enter it under *Other Organisms* but do not include antibiogram. Note: Any infection reported as an MDRO or CDI must have a pathogen identified.
Custom Fields and Labels	Optional. Up to two date fields, two numeric fields, and 10 alphanumeric fields may be customized for local use. NOTE: Each custom Field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter comments for local use and the values entered. These fields may not be analyzed.

Table 21. Instructions for Completion of the MDRO and CDAD Prevention Process and Outcome Measures Monthly Monitoring form (CDC 57.127)

Data Field	Instructions for Form Completion
Facility ID #	The NHSN-assigned facility ID number will be autoentered by the computer
Month	Required. Enter the 2-digit month during which surveillance was performed.
Year	Required. Enter the 4-digit year during which surveillance was performed.
Location Code	Required. Enter the code of the patient care location where the outcome measures monitoring was done.
Setting: Inpatient Days	Conditionally Required. If this is an inpatient location, enter the total number of patient days for this location for the month.
Admissions	Conditionally required. Enter the total number of admissions for this location if Active Surveillance Testing (AST) or LabID event monitoring was performed.
Setting: Outpatient (or Emergency Room) Encounters	Conditionally required. If LabID Event monitoring is performed in outpatient and/or emergency room locations, enter the total number of encounters occurring during the surveillance month. If performing Overall facility-wide surveillance and Settings = *Both* on the Monthly Reporting Plan, enter Inpatient Days, Admissions and Outpatient Encounters.
MDRO and CDAD Infection Surveillance or LabID Event Reporting	
Infection Surveillance	Conditionally required. Check any MDRO or *C. difficile* organism selected for monitoring in the location during the time period specified.
LabID Event	Conditionally required. Check any MDRO or *C. difficile* organism selected for LabID event reporting in the location during the time period specified.
Process Measures (Optional)	
Hand Hygiene Performed	Required for hand hygiene adherence process measures. Enter the total number of observed contacts during which an HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and appropriate hand hygiene was performed (i.e., Hand Hygiene Performed).
Indicated	Required for hand hygiene adherence process measures. Enter the total number of observed contacts during which an HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and therefore, appropriate hand hygiene was indicated (i.e., Hand Hygiene Indicated).

Data Field	Instructions for Form Completion
Gown and Gloves Used	Required for gown and gloves use adherence process measures. Among patients on Contact Precautions, enter the total number of observed contacts between an HCW and a patient or inanimate objects in the immediate vicinity of the patient for which gloves and gowns had been donned prior to the contact (i.e., Gown and Gloves Used).
Indicated	Required for gown and gloves use adherence process measures. Among patients on Contact Precautions, enter the total number of observed contacts between an HCW and a patient or inanimate objects in the immediate vicinity of the patient and therefore, gloves and gowns were indicated (i.e., Gown and Gloves Indicated).
Active Surveillance Testing (For MRSA & VRE only)	
Active Surveillance Testing performed	Required for active surveillance testing adherence process measures. For MRSA and VRE only. Check those for which active surveillance testing is being done.
Timing of AST • Adm • Both	Required for active surveillance testing adherence process measures. Choose the time period when surveillance testing will be performed. Specimens for AST can be obtained at the time of admission (Adm), or at the time of admission and for patients' stays of > 3 days, at the time of discharge/transfer (Both).
AST Eligible Patients • All • NHx	Required for admission surveillance testing adherence process measures. If all admitted patients were tested choose All. Circle NHx if performing AST only on those patients admitted to the patient care location with no documentation at the time of admission of MRSA and/or VRE colonization or infection in ≤ 12 months (NHx). That is, no specimen positive for MRSA and/or VRE for this patient during previous stays at this facility or from information provided by referring facilities in ≤ 12 months.
Admission AST • Performed • Eligible	Required for admission surveillance testing adherence process measures. Enter the number of patients eligible for admission AST and who had a specimen obtained for testing ≤ 3 days of admission (i.e., Admission AST Performed). Enter the number of patients eligible for admission surveillance testing. (i.e., Admission AST Eligible)
Discharge/Transfer AST • Performed • Eligible	Required for discharge/transfer active surveillance testing adherence process measures. For patients' stays > 3 days, enter the number of discharged or transferred patients eligible for AST and who had a specimen obtained for testing prior to discharge or transfer, not including the admission AST (i.e., Discharge/Transfer AST Performed). For patients' with stays of > 3 days, enter the number of patients eligible

Data Field	Instructions for Form Completion
	for discharge/transfer surveillance testing; were negative if tested on admission. (i.e., Discharge/Transfer AST Eligible).
Outcome Measures (Optional) - MRSA & VRE ONLY	
Prevalent Cases	
AST/Clinical Positive	Required for prevalent case - AST/clinical positive outcome measures. Enter the number of patients with MRSA and/or VRE isolated from a specimen collected for AST or for clinical reasons on admission (≤ 3 days) (i.e., the MRSA or VRE cannot be attributed to this patient care location).
Known Positive	Enter the number of patients with documentation on admission of MRSA or VRE colonization or infection, from the admitting or referring facility, in ≤ 12 months (i.e., patient is known to be colonized or infected with MRSA and/or VRE within the last year). All MRSA or VRE colonized patients already in the ICU during the first month of surveillance should be considered "Known Positive".
Incident Cases	
AST/Clinical Positive	Required for incident case - AST/clinical positive outcome measures. Enter the number of patients with a stay > 3 days: • With no documentation on admission of MRSA and/or VRE colonization or infection, from the admitting or referring facility, in ≤ 12 months (i.e., patient is not known to be colonized or infected with MRSA and/or VRE within the last year and is negative if tested on admission), AND • MRSA and/or VRE isolated from a specimen collected for AST or clinical reasons > 3 days after admission and up to discharge/transfer from the patient care location.
Custom Fields and Labels	Optional. Up to 5 numeric fields may be customized for local use. NOTE: Each custom field must be set up in the Facility/Custom Options section of the application before the field can be selected for use.
Comments	Optional. Enter comments for local use and the values entered. These fields may not be analyzed.

CDC Location Label	Location Description
LOCATIONS	
Adult Critical Care Units	
Burn Critical Care	Critical care area specializing in the care of patients with significant/major burns.
Medical Cardiac Critical Care	Critical care area specializing in the care of patients with serious heart problems that do not require heart surgery.
Surgical Cardiothoracic Critical Care	Critical care area specializing in the care of patients following cardiac and thoracic surgery.
Medical Critical Care	Critical care area for patients who are being treated for nonsurgical conditions.
Medical/Surgical Critical Care	An area where critically ill patients with medical and/or surgical conditions are managed.
Neurologic Critical Care	Critical care area specializing in treating life-threatening neurological diseases.
Neurosurgical Critical Care	Critical care area specializing in the surgical management of patients with severe neurological diseases or those at risk for neurological injury as a result of surgery.
Prenatal Critical Care	Critical care area specializing in the management of the pregnant patient with complex medical or obstetric problems requiring a high level of care to prevent the loss of the fetus and to protect the life of the mother.
Respiratory Critical Care	Critical care area for the evaluation and treatment of the patient with severe respiratory conditions.
Surgical Critical Care	Critical care area for the evaluation and management of patients with serious illness before and/or after surgery.
Trauma Critical Care	Critical care area specializing in the care of patients who require a high level of monitoring and/or intervention following trauma or during critical illness related to trauma.
Pediatric Critical Care Units	
Pediatric Burn Critical Care	Critical care area specializing in the care of patients ≤ 18 years old with significant/major burns
Pediatric Cardiothoracic Critical Care	Critical care area specializing in the care of patients ≤ 18 years old following cardiac and thoracic surgery.
Pediatric Medical Critical Care	Critical care area for patients ≤ 18 years old who are being treated for nonsurgical conditions. In the NNIS system, this was called Pediatric ICU (PICU).

Pediatric Medical/Surgical Critical Care	An area where critically ill patients ≤ 18 years old with medical and/or surgical conditions are managed.
Pediatric Neurology Critical Care	Critical care area for patients ≤ 18 years old specializing in treating life-threatening neurological diseases.
Pediatric Neurosurgical Critical Care	Critical care area specializing in the surgical management of patients ≤ 18 years old with severe neurological diseases or those at risk for neurological injury as a result of surgery.
Pediatric Respiratory Critical Care	Critical care area for the evaluation and treatment of the patients ≤ 18 years old with severe respiratory conditions.
Pediatric Surgical Critical Care	Critical care area for the evaluation and management of patients ≤ 18 years old with serious illness before and/or after surgery.
Pediatric Trauma Critical Care	Critical care area specializing in the care of patients ≤ 18 years old who require a high level of monitoring and/or intervention following trauma or during critical illness related to trauma.
Neonatal Units[1]	
Well Baby Nursery (Level I)	Hospital area for evaluation and postnatal care of healthy newborns. May include neonatal resuscitation and stabilization of ill newborns until transfer to a facility at which specialty neonatal care is provided.
Step down Neonatal ICU (Level II)	Special care nursery for care of preterm infants with birth weight ≥1500g. Includes resuscitation and stabilization of preterm and/or ill infants before transfer to a facility at which newborn intensive care is provided.
Neonatal Critical Care(Level II/III)	Combined nursery housing both Level II and III newborns and infants.
Neonatal Critical Care (Level III)	A hospital neonatal intensive care unit (NICU) organized with personnel and equipment to provide continuous life support and comprehensive care for extremely high-risk newborn infants and those with complex and critical illness. Level III is subdivided into 4 levels differentiated by the capability to provide advanced medical and surgical care. NOTE: The categories of Level III below are classifications from the American Academy of Pediatrics, Definitions of hospital-based newborn services[1]. These classifications are

	all considered Level III nurseries in NHSN. Level IIIA - Hospital or state-mandated restriction on type and/or duration of mechanical ventilation. Level IIIB - No restrictions on type or duration of mechanical ventilation. No major surgery. Level IIIC - Major surgery performed on site (eg, omphalocele repair, tracheoesophageal fistula or esophageal atresia repair, bowel resection, myelomeningocele repair, ventriculoperitoneal shunt). No surgical repair of serious congenital heart anomalies that require cardiopulmonary bypass and /or ECMO for medical conditions. Level IIID - Major surgery, surgical repair of serious congenital heart anomalies that require cardiopulmonary bypass, and/or ECMO for medical conditions.
Inpatient Specialty Care Areas	
Long Term Acute Care (LTAC)	Area that provides acute care services to patients suffering medically complex conditions, or patients who have suffered recent catastrophic illness or injury and require an extended stay in an acute care environment.
Bone Marrow Transplant Specialty Care Area	Hospital specialty care area for the treatment of patients who undergo bone marrow (stem cell) transplant for the treatment of various disorders.
Acute Dialysis Unit	Hospital specialty care area for patients who require acute dialysis as a temporary measure.
Hematology/Oncology SCA	Hospital specialty care area for the management and treatment of patients with cancer and/or blood disorders.
Solid Organ Transplant SCA	Hospital specialty area for the postoperative care of patients who have had a solid organ transplant (e.g., heart/lung, kidney, liver, pancreas)
Pediatric Bone Marrow Transplant SCA	Hospital specialty care area for the treatment of patients ≤ 18 years old who undergo bone marrow (stem cell) transplant for the treatment of various disorders.
Pediatric Dialysis SCA	Hospital specialty care area for patients ≤ 18 years oldwho require acute dialysis as a temporary measure.
Pediatric Hematology/Oncology SCA	Hospital specialty care area for the management and treatment of patients ≤ 18 years old with cancer and/or blood disorders.

Pediatric Solid Organ Transplant SCA	Hospital specialty area for the postoperative care of patients ≤ 18 years old who have had a solid organ transplant (e.g., heart/lung, kidney, liver, pancreas).
Inpatient Adult Wards	
Burn Ward	Hospital area for evaluation and treatment of patients who have burns.
Behavioral Health/Psych Ward	Hospital area for evaluation and treatment of patients with acute psychiatric or behavioral disorders.
Ear/Nose/Throat Ward	Hospital area for the evaluation, treatment, or surgery of patients with ear, nose, or throat disorders
Gastrointestinal Ward	Hospital area for evaluation, treatment or surgery of patients with disorders of the gastrointestinal tract.
Gerontology Ward	Hospital area for the evaluation, treatment or surgery of patients with age-related diseases.
Genitourinary Ward	Hospital area for the evaluation, treatment or surgery of patients with disorders of the genitourinary system.
Gynecology Ward	Hospital area for the evaluation, treatment, or surgery of female patients with reproductive tract disorders.
School Infirmary	Overnight stay patient care area of a school infirmary or health center (e.g., private residential school or college campus).
Jail Unit	Overnight stay patient care area of a hospital or correctional facility used only for those who are in custody of law enforcement during their treatment.
Labor and Delivery Ward	Hospital area where women labor and give birth.
Labor, Delivery, Recovery, Postpartum Room (LDRP)	Hospital suite used for labor, delivery, recovery and post partum (LDRP) -- all within the same suite.
Medical Ward	Hospital area for the evaluation and treatment of patients with medical conditions or disorders.
Medical/Surgical Ward	Hospital area for the evaluation of patients with medical and/or surgical conditions.
Neurology Ward	Hospital area where patients with neurological disorders are evaluated and treated.

Neurosurgical Ward	Hospital area for care of patients whose primary reason for admission is to have neurosurgery or to be cared for by a neurosurgeon after head or spinal trauma.
Orthopedic Trauma Ward	Hospital area where patients with orthopedic injuries or disorders are evaluated and treated.
Plastic Surgery Ward	Hospital area for the care of patients who have reconstructive surgery performed by a plastic surgeon.
Postpartum Ward	Hospital area for the patient who is recovering from childbirth.
Pulmonary Ward	Hospital area where patients with respiratory system conditions or disorders are evaluated and treated.
Ophthalmology Ward	Hospital area for care of patients whose primary reason for admission is to have eye surgery or to be cared for by an ophthalmologist after eye trauma.
Orthopedic Ward	Hospital area for evaluation, treatment or surgery on bones, joints, and associated structures by an orthopedist.
Rehabilitation Ward	Hospital area for evaluation and restoration of function to patients who have lost function due to acute or chronic pain, musculoskeletal problems, stroke, or catastrophic events resulting in complete or partial paralysis.
Surgical Ward	Hospital area for evaluation and treatment of patients who have undergone a surgical procedure.
Acute Stroke Unit	Hospital area for evaluation, stabilization and treatment of patients who have experienced an acute stroke.
Vascular Surgery Ward	Hospital area for evaluation and treatment of patients who have undergone vascular surgery.
Inpatient Pediatric Wards	
Adolescent Behavioral Health	Hospital area for evaluation and treatment of patients between the ages of 13 and 18 with acute psychiatric or behavioral disorders.
Pediatric Burn Ward	Hospital area specializing in the evaluation and treatment of patients ≤18 years who have tissue injury caused by burns.
Pediatric Behavioral Health	Hospital area for evaluation and management of patients ≤18 years old with acute psychiatric or behavioral disorders.
Pediatric Ear, Nose, Throat	Hospital area for evaluation and management of patients ≤18 years old with disorders of the ear, nose and/or throat.

Pediatric Genitourinary	Hospital area where patients ≤ 18 years of age with disorders of the genitourinary system are evaluated and treated.
Medical Pediatric Ward	Hospital area where patients ≤ 18 years of age with medical conditions or disorders are evaluated and treated.
Pediatric Med/Surg Ward	Hospital area where patients ≤ 18 years old with medical and/or surgical conditions are managed.
Pediatric Neurology Ward	Hospital area where patients ≤ 18 years old with neurological disorders are evaluated and treated.
Pediatric Neurosurgical Ward	Hospital area for care of patients ≤ 18 years old whose primary reason for admission is to have neurosurgery or to be cared for by a neurosurgeon after head or spinal trauma.
Pediatric Orthopedic Ward	Hospital area where patients ≤ 18 years old with orthopedic injuries or disorders are evaluated and treated.
Pediatric Rehabilitation Ward	Hospital area for evaluation and restoration of function to patients ≤ 18 years old who have lost function due to acute or chronic pain, musculoskeletal problems, stroke, or catastrophic events resulting in complete or partial paralysis.
Pediatric Surgical Ward	Hospital area for evaluation and treatment of patients ≤ 18 years old who have undergone a surgical procedure.
Step Down Units	
Step Down Unit (post Critical Care)	Hospital area for adult patients that are hemodynamically stable who can benefit from close supervision and monitoring, such as frequent pulmonary toilet, vital signs, and/or neurological and neurovascular checks.
Pediatric Step Down Unit	Patients ≤ 18 years old that are hemodynamically stable who can benefit from close supervision and monitoring, such as frequent pulmonary toilet, vital signs, and/or neurological and neurovascular checks.
Operating Rooms	
Operating Room/Suite	A room or suite in a hospital equipped for the performance of surgical operations. Requirements for air changes, temperature, humidity and surfaces must be met. (For outpatient operating room, use Ambulatory Surgery Center designation or other specialty OR shown in Outpatient Locations section of this chapter.)

Cardiac Catheterization Room/Suite	A room or rooms in a hospital equipped for the performance of heart catheterizations for diagnostic or therapeutic purposes. Operating Room requirements for air changes, temperature, humidity and surfaces must be met.
Cesarean Section Room/Suite	A room or suite in a hospital equipped for the performance of obstetric and gynecologic surgeries and for the care of the neonate immediately after birth. Operating Room requirements for air changes, temperature, humidity and surfaces must be met.
Interventional Radiology	A room or suite in a hospital where diagnostic or therapeutic radiologic procedures on outpatients and/or inpatients occurs. Operating Room requirements for air changes, temperature, humidity and surfaces must be met.
Post Anesthesia Care Unit/Recovery Room	Hospital area designated for monitoring patients for immediate effects of anesthesia before either going home or on to an in-patient care area.
Long Term Care	
Long Term Care Unit	Area where care provided for persons with chronic disease or disabilities for extended periods of time.
Long Term Care Alzheimer's Unit	Area where care is provided to persons diagnosed with Alzheimer's syndrome for extended periods of time.
Long Term Care Behavioral Health/Psych Unit	Area where care is provided to individuals with psychiatric or behavioral-disorder diagnoses for extended periods of time.
Hospice	Area where palliative care is provided to the dying patient.
Ventilator Dependent Unit	Area where care is provided to patients whose respirations depend on the use of a ventilator for extended periods of time.
Long Term Care Rehabilitation Unit	Area where evaluation and restoration of function is provided to patients who have lost function due to acute or chronic pain, musculoskeletal problems, stroke, or catastrophic events resulting in complete or partial paralysis.
AUR Documentation Only	
All Wards (not ICU or SCA) combined	This location represents an aggregate of all care areas, excluding critical care, specialty care, and outpatient areas. This location is used for the purpose of reporting microbiology and pharmacy data as part of the AUR option only.

All Outpatient Areas	This location represents an aggregate of all outpatient areas and is used for the purpose of reporting microbiology data as part of the AUR Option only.
Miscellaneous Areas	
All Inpatient Beds Combined	This location represents all beds. It is used for reporting optional facility-wide summary data (e.g., CLABSI rate for facility).
Sleep Studies (for in and out patients)	Area where patients stay overnight and are evaluated for sleep disorders.
Pulmonary Function Testing	Area where the evaluation of a patient's respiratory status takes place.
Transport Service	Mobile unit used to transport patients to their home or from one healthcare setting to another non-emergently.
OUTPATIENT LOCATIONS	
Acute Care Settings	
Urgent Care Center	Area that provides medical care services for illnesses and injuries that are not life-threatening.
Outpatient Emergency Department	Area that provides emergency medical services; top priority is given to those with life-threatening illness or injury.
Pediatric Emergency Department	Area that provides emergency medical services to patients who are ≤ 18 years old; top priority is given to those with life-threatening illness or injury.
Mobile Emergency Services/EMS	Mobile unit that provides clinical and emergency medical services to individuals who require them in the pre-hospital setting.
Ambulatory Surgery Center	Area that is equipped for the performance of surgical operations; may be free-standing or part of a hospital. Operating Room requirements for air changes, temperature, humidity and surfaces must be met. Patients do not stay overnight.
Outpatient Pediatric Surgery Center	Area that is equipped for the performance of surgical operations for persons ≤ 18 years old, may be free-standing or part of a hospital.. Operating Room requirements for air changes, temperature, humidity and surfaces must be met. Patients do not stay overnight.

Outpatient Plastic Surgery Center	Area that is equipped for the performance of plastic surgery operations may be free-standing or part of a hospital. Operating Room requirements for air changes, temperature, humidity and surfaces must be met. Patients do not stay overnight.
Outpatient Surgery Recovery Room/Post Anesthesia Care Unit	Area designated for monitoring patients for the immediate effects of anesthesia before being sent home.
24-Hour Observation Area	Area where patients are monitored for suspected or non-life threatening conditions for 24 hours or less.
Clinic (Nonacute) Settings	
Allergy Clinic	An outpatient setting for the purpose of providing services to individuals with allergies.
Behavioral Health Clinic	An outpatient setting for the purpose of providing services to individuals with psychiatric or behavior-disorders.
Blood Collection Center	An outpatient setting where blood is collected from donors. This does not include donation centers that are temporarily set up in non-clinical settings (e.g., schools, churches) or mobile blood collection centers.
Cardiac Rehabilitation Center	An outpatient setting where patients with cardiac disease, in partnership with a multidisciplinary team of health professionals, are encouraged and supported to achieve and maintain optimal physical health through exercise, nutritional and psychological counseling.
Cardiology Clinic	An outpatient setting for the evaluation and management of individuals with cardiac problems.
Continence Clinic	An outpatient setting for the evaluation and management of individuals with incontinence problems.
Dermatology Clinic	An outpatient setting for the evaluation and management of dermatologic conditions by a dermatologist.
Diabetes/Endocrinology Clinic	An outpatient setting for the evaluation, education and management of persons with diabetes.
Ear, Nose, Throat Clinic	An outpatient setting for the evaluation and management of conditions related to the ear, nose and/or throat.
Family Medicine Clinic	An outpatient setting for patients who are managed by a family practice physician or group of physicians. Does not include private physician practice.

Genetics Clinic	An outpatient setting for testing and counseling of individuals may have genetic or hereditary disorders.
Gynecology Clinic	An outpatient setting for women for the evaluation and management of female reproductive tract conditions.
Holistic Medicine Center	An outpatient setting where alternative healthcare practices are used, focusing on the physical, mental, emotional, social and spiritual aspects of health.
Hyperbaric Oxygen Center	An outpatient setting where therapeutic hyperbaric oxygen is administered.
Infusion Center	An outpatient setting for the administration of fluids, blood products and medications.
Neurology Clinic	An outpatient setting for the diagnosis, evaluation, and treatment of persons with neurologic disorders.
Occupational Health Clinic	An outpatient setting where workplace physicals, workplace injury management and immunological evaluations take place.
Occupational Therapy Clinic	An outpatient setting where persons with injury or disability are helped to resume activities of daily living with exercise, massage and other therapies.
Ophthalmology Clinic	An outpatient setting for the diagnosis, evaluation and treatment of ophthalmologic disorders.
Orthopedic Clinic	An outpatient setting for the diagnosis, evaluation and treatment of orthopedic disorders.
Ostomy Clinic	An outpatient setting for the management of persons who have had surgical procedure for removing normal bodily wastes through a surgical opening (stoma) on the abdominal wall.
Outpatient Dental Clinic	An outpatient setting that provides dental services, including preventive teeth cleaning, emergency treatment, and comprehensive oral care. This may be a private or group practice or a teaching facility for dentists and/or dental hygienists.
Outpatient GI Clinic	An outpatient setting for the diagnosis, evaluation and management of conditions related to the gastrointestinal tract. Usually includes an endoscopy suite.

Outpatient Hematology/Oncology Clinic	An outpatient setting for the diagnosis, evaluation and treatment of persons with hematologic and/or oncologic disorders. This may include chemotherapy or blood/blood products infusion services.
Outpatient Hemodialysis Clinic	An outpatient setting for chronic hemodialysis patients where they are evaluated and dialyzed several times weekly.
Outpatient HIV Clinic	An outpatient setting for the diagnosis, evaluation and treatment of persons who are HIV positive or who have AIDS.
Outpatient Medical Clinic	An outpatient setting for the diagnosis, evaluation and treatment of medical disorders.
Outpatient Rehabilitation Clinic	An outpatient setting where persons with injury or disability are evaluated and treated to resume activities of daily living, speech and language skills and maximum physical function. This may include social and psychological evaluation and treatment.
Pain Clinic	An outpatient setting for the evaluation and treatment of persons with chronic or intractable pain.
Pediatric Behavioral Health Clinic	An outpatient setting for the evaluation and management of persons ≤ 18 years old with psychiatric or behavior disorders.
Pediatric Cardiology Center	An outpatient setting for the evaluation and management of persons ≤ 18 years old with cardiac disorders.
Pediatric Clinic	An outpatient setting for the evaluation and treatment of children under the age of nineteen.
Pediatric Dental Clinic	An outpatient setting that provides dental services, including preventive teeth cleaning, emergency treatment, and comprehensive oral care to persons ≤ 18 years old. This may be a private or group practice or a teaching facility for dentists and/or dental hygienists.
Pediatric Dermatology Clinic	An outpatient setting for the evaluation and management of persons ≤ 18 years old with dermatologic disorders.
Pediatric Diabetes/Endocrinology Clinic	An outpatient setting for the evaluation and management of persons ≤ 18 years old with diabetes or other endocrine disorders.
Pediatric Gastrointestinal Clinic	An outpatient setting for the evaluation and treatment of patients ≤ 18 years old with gastrointestinal disorders.

Pediatric Hematology/Oncology Clinic	An outpatient setting for the evaluation and treatment of patients ≤ 18 years old with cancer and/or blood disorders.
Pediatric Nephrology Clinic	An outpatient setting for the evaluation and treatment of patients ≤ 18 years old with disorders of the genitourinary tract.
Pediatric Orthopedic Clinic	An outpatient setting for the evaluation and treatment of patients ≤ 18 years old with fractures or other orthopedic disorders.
Pediatric Rheumatology Clinic	An outpatient setting for the evaluation and treatment of patients ≤ 18 years old with rheumatology disorders.
Pediatric Scoliosis Clinic	An outpatient setting for the evaluation and treatment of patients ≤ 18 years old with scoliosis or other growth disorders of the spine.
Physical Therapy Clinic	An outpatient setting where persons with injury or disability are helped to obtain maximum physical function.
Physician's Office	A physician's office practice.
Podiatry Clinic	An outpatient setting for the evaluation and treatment of individuals with conditions or disorders of the feet.
Prenatal Clinic	An outpatient setting for the evaluation and treatment of pregnant women.
Pulmonary Clinic	An outpatient setting for the evaluation and treatment of persons with disorders of the respiratory tract.
Rheumatology Clinic	An outpatient setting for the evaluation and treatment of persons with autoimmune disorders, primarily rheumatoid arthritis.
School or Prison Infirmary	Area in a school or correctional facility that provides medical care to students/inmates. This area is not staffed or equipped for overnight stay patients.
Specimen Collection Area (Healthcare)	An area in within a healthcare facility where procedures are performed to collect blood, tissue and other specimens for diagnostic purposes.
Speech Therapy Clinic	An outpatient setting for the evaluation and treatment of persons with brain injury to maximize their speech, swallow and language functions.
Surgical Services Clinic	An outpatient setting for the pre-operative evaluation and the postoperative management of individuals undergoing a surgical procedure.
Well Baby Clinic	An outpatient setting for the examination and treatment of normal newborns.
Wound Center	An outpatient setting for the evaluation and treatment of persons with acute or chronic wounds.

Wound Ostomy Continence Clinic	An outpatient area which provides acute and rehabilitative care for people with selective disorders of the gastrointestinal, genitourinary and integumentary (skin) systems.
Endoscopy Suite	An area where endoscopic procedures (e.g., upper gastrointestinal, lower gastrointestinal endoscopies, bronchoscopy) are performed on outpatients and/or inpatients. Patient care and processing of equipment may take place in this location.
Radiology, includes Nuclear Medicine	An area where diagnostic or therapeutic radiologic procedures are done on outpatients and/or inpatients. This location does not meet Operating Room requirements for air changes, temperature, humidity or surfaces.
Mobile Blood Collection center	A self-contained mobile unit such as a bus or trailer that is specifically designed and equipped for the collection of blood and blood products from public donors. This unit typically moves from location to location.
Mobile MRI/CT	A self-contained mobile unit such as a bus or trailer that is equipped with MRI or CT radiologic equipment and that may be moved between health care locations (e.g., hospitals, clinics).
COMMUNITY LOCATIONS	
Blood Collection (Blood Drive Campaign)	A location that was not designed for nor equipped to perform healthcare functions (e.g., school gym or shopping mall) that has been set up specifically to collect donations of blood and blood products from the public.
Home Care	A patient's home location where medical services including routine non-invasive and other invasive procedures (e.g., insertion of indwelling urinary catheter, insertion of IV line, etc.) are performed by health care workers and family members under the supervision of a licensed independent practitioner (e.g., MD, CNP,PA)
Home-based Hospice	A patient's home location where end-of-life services are performed by health care workers, family members and volunteers.
Location Outside Facility	A location outside this facility, including unknown outside location. Used only in "Location of Device Insertion" drop down list of locations.
Specimen Collection Area (Community)	A location that was not designed for nor equipped to perform healthcare functions (e.g., school gym or shopping mall) that has been set up specifically to collect body fluids for health care testing. Examples would be blood sugar or cholesterol screening clinics.

NON-PATIENT CARE LOCATIONS

Assisted Living Area	A location where persons live and have available to them housekeeping, meal preparation, transportation and other non-medical services. Patient care is not done in this area.
Blood Bank	An area within a health care facility that may collect, store and distribute blood and blood products. Also perform diagnostic tests on blood/components to determine compatibilities.
Clinical Chemistry	An area within a diagnostic laboratory that does general clinical chemistry (clinical biochemistry), endocrinology, therapeutic substance monitoring, toxicology, blood pH and gases, urinalysis, and urine pregnancy testing.
Hematology	An area within a diagnostic laboratory that determines the specific properties of blood (e.g., CBC, white blood count).
Histology/Surgical Pathology	An area within a diagnostic laboratory that uses high-power microscopy to evaluate cells and tissues for the presence or absence of disease.
Microbiology	An area within a laboratory that performs diagnostic tests to determine the presence or absence of bacteria and its related properties.
Morgue/Autopsy Room	An area within a facility that is used for the storage and/or postmortem examination of deceased persons.
Serology Lab	An area within a diagnostic laboratory that performs blood tests to determine the presence or absence of certain diseases or the levels of immunity.
Soiled Utility Area	An area within a healthcare facility where used and/or soiled disposable or durable medical equipment is stored and/or cleaned in preparation for disposal or reprocessing/reuse.
Virology Lab	An area within a diagnostic laboratory that performs tests and/or culturing to determine the presence or absence of specific viruses.
General Laboratory	An area which encompasses all clinical divisions within a diagnostic laboratory.
Administrative Areas	Areas within a healthcare facility where administrative functions take place. No patient care takes place in these areas.
Central Sterile Supply	An area within a healthcare facility where durable medical equipment is cleaned/decontaminated, wrapped, sterilized and stored in preparation for patient use.

Physical Plant Operations Center	An area within a healthcare facility where construction, renovation, and maintenance staff activities and supplies are coordinated. This may also include areas of machinery and equipment.
Facility Grounds	Any outdoor area adjacent to a healthcare facility that belongs to the facility (e.g. sidewalks, parking ramps, lawns, etc.).
Housekeeping/Environmental Services	An area within a healthcare facility where housekeeping/environmental services staff activities are coordinated and supplies are stored.
Laundry Room	An area within a healthcare facility where laundry is sorted, washed, dried and prepared for transport and use.
Pharmacy	An area within a healthcare facility where medications are prepared and labeled for patient use.
Public Area in Facility	Any indoor area within a healthcare facility that is not used for patient care and that is available to the public (e.g., waiting rooms, cafeterias, hallways).
Central Trash Area	An area adjacent to a healthcare facility where biohazardous and non-biohazardous wastes are collected in preparation for transport to a landfill or incineration.

[1] Definitions of Hospital-Based Newborn Services Used for Survey Performed by Section on Perinatal Pediatrics American Academy of Pediatrics website: http://aappolicy.aappublications.org/cgi/content/full/pediatrics;114/5/1341/T1 , accessed, July 8, 2008.

Key Terms

80% Rule — See CDC Location.

Access-associated bacteremia — See Dialysis access-associated infection types.

ASA Score — Assessment by the anesthesiologist of the patient's preoperative physical condition using the American Society of Anesthesiologist' (ASA) Classification of Physical Status. Patient is assigned one of the following which is used as one element of the SSI Basic Risk index:

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 the operation

Birthweight — Birthweight is the weight of the infant at the time of birth and should not be changed as the infant gains weight.

Catheter-associated Urinary Tract Infection (CAUTI) — CAUTI is a urinary tract infection (UTI) that occurs in a patient who had an indwelling urinary catheter in place within the 48-hour period before the onset of the UTI. NOTE: There is no minimum period of time that the catheter must be in place in order for the UTI to be considered catheter-associated. See also Indwelling urinary catheter and Device-associated infection.

CDC 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. The specific CDC Location code is determined by the type of patients cared for in that area according to the **80% Rule**. That is, 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).

Central line An intravascular catheter 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 BSIs and counting central-line days in the NHSN system: Aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, and common femoral veins.
NOTE: An introducer is considered an intravascular catheter
NOTE: In neonates, the umbilical artery/vein is considered a great vessel.
NOTE: Neither the insertion site nor the type of device may be used to determine if a line qualifies as a central line. The device must terminate in one of these vessels or in or near the heart to qualify as a central line.
NOTE: Pacemaker wires and other nonlumened 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.

Central Line-associated Bloodstream Infection (CLABSI) A 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 and that is not related to an infection at another site. NOTE: There is no minimum period of time that the central line must be in place in order for the BSI to be considered central line-associated. See also Central line and Device-associated infection.

Clean (Wound Class) See Wound Class

Clean Contaminated (Wound Class) See Wound Class

Contaminated (Wound Class) See Wound Class

Date of Event In the case of an infection event, the date when the first signs or symptoms of infection (clinical evidence) appeared, or the date the specimen used to meet the infection criterion was collected, whichever came first. In the case of a process of care event, the date the process or intervention was done (e.g., day a central line was inserted is the date of CLIP event). See also Transfer rule.

Deep incisional primary (DIP) SSI 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 CBGB).

Deep incisional A deep incisional SSI that is identified in the secondary incision in a patient that

secondary (DIS) SSI	has had an operation with more than one incision (e.g., donor site [leg] incision for CBGB).
Device-associated infection	An infection in a patient with a device (e.g., ventilator, central line or indwelling urinary catheter) that was used within the 48-hour period before onset of infection. If the interval is longer than 48 hours, there must be compelling evidence that the infection was associated with device use. NOTE: There is no minimum period of time that the device must be in place in order for the infection to be considered device-associated.
Device days	A daily count of the number of patients with a specific device in the patient care location during a time period. To calculate device days, for each day of the month, at the same time each day, record the number of patients who have the specific device (e.g., central line, ventilator, or indwelling urinary catheter). At the end of the month sum the daily counts and enter into NHSN the total for each type of device.
Died	The patient died during this facility admission.
Dialysis event types (Outpatient hemodialysis only)	Hospitalization if patient stayed overnight in a hospital, not just those related to infections or those where patient was directly admitted from the dialysis unit. Each time a patient is hospitalized, enter it as a new event. If a patient is hospitalized and returns to the dialysis unit on IV antimicrobials, both will be included in the same event – do not enter a second event. In-unit IV antimicrobial start if patient is given IV antimicrobial agents in the dialysis unit for any reason, not just those with vancomycin or for a vascular access problem. If IV antimicrobials are stopped for less than 21 days and then restarted, this is NOT considered a new event. However, if IV antimicrobials are stopped for 21 or more days and then restarted, this is considered a new event. Positive blood culture if the patient blood culture is positive, even if they did not have an associated hospitalization or in-unit IV antimicrobial start. Include blood cultures taken as an outpatient or within 1 day after a hospital admission. If the patient had an associated hospitalization or in-unit IV antimicrobial start, use the appropriate rule (above) for entering the event; if the patient had neither, enter a new event for positive blood culture occurring 21 or more days after the first.
Dialysis access-associated infection types (Outpatient hemodialysis only)	Local access infection: Pus, redness, or swelling of the vascular access site and access-associated bacteremia was not present and patient was hospitalized or had initiation of an IV antimicrobial agent. Access-associated bacteremia: Blood culture positive with source identified as the vascular access site or unknown.

Vascular access infection: Either local access infection or access-associated bacteremia.

Dirty or Infected (Wound Class) See Wound Class

Duplicate isolate (in AUR protocol) An isolate of the same species of bacteria, regardless of antimicrobial susceptibility pattern, in the same patient, regardless of specimen site, during a given reporting period (i.e., calendar month).

Duplicate isolate (in MDRO/CDAD protocol) Any MDRO isolate from the same patient after an initial isolation of the specific MDRO during a calendar month, regardless of specimen source.

Event contributed to death The event either directly caused death or exacerbated an existing disease condition which then led to death.

Event date See Date of event.

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. See also Chapter 17.

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

Indwelling urinary 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.

Infant A patient who is ≤ 1 year of age.

Infection date See Date of event.

Infusion The introduction of a solution through a blood vessel via a catheter lumen. This may include continuous infusions such as nutritional fluids or medications, or it may include intermittent infusions such as flushes or IV antimicrobial

administration, or blood, in the case of transfusion or hemodialysis.

Inpatient location — See Location

Intensive care unit (ICU) — A nursing care area that provides intensive observation, diagnosis, and therapeutic procedures for adults and/or children who are critically ill. An ICU excludes nursing areas that provide step-down, intermediate care or telemetry only. Specialty care areas are also excluded(see definition) .
The type of ICU is determined by the kind of patients cared for in that unit. That is, if 80% of patients are of a certain type (e.g., patients with trauma), then that ICU is designated as that type of unit (in this case, trauma ICU). When an ICU houses roughly equal populations of medical and surgical patients, it is called a medical/surgical ICU.

Local access infection — See Dialysis access-associated infection types.

Location — The patient care 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 for reporting infection events when the Device-associated Module is included on a Monthly Reporting Plan. For such months, operating rooms (including cardiac cath labs, c-section rooms, and interventional radiology) and outpatient locations are not valid locations.
See also CDC Location.

Location of attribution — The location to which the event is being attributed. See also Date of event and Transfer rule.

Multiple procedures — More than one NHSN operative procedure performed through the same incision during the same trip to the operating room.

Neonatal intensive care unit (NICU)

NICU (Level II/III) — Combined nursery housing both Level II and III newborns and infants.
NOTE: Level II is an NHSN Step Down Neonatal ICU and provides care for preterm infants with birth weight ≥ 1500g. Care provided includes resuscitation and stabilization of preterm and/or ill infants before transfer to a facility at which newborn intensive care is provided.

NICU (Level III)	A hospital unit organized with personnel and equipment to provide continuous life support and comprehensive care for extremely high-risk newborn infants and those with complex and critical illness. Level III is subdivided into 4 levels differentiated by the capability to provide advanced medical and surgical care. NOTE: The categories of Level III, listed below, are classifications from the American Academy of Pediatrics, Definitions of hospital-based newborn services[1]. These classifications are all considered Level III nurseries in NHSN. Level IIIA - Hospital or state-mandated restriction on type and/or duration of mechanical ventilation. Level IIIB - No restrictions on type or duration of mechanical ventilation. No major surgery. Level IIIC - Major surgery performed on site (eg, omphalocele repair, tracheoesophageal fistula or esophageal atresia repair, bowel resection, myelomeningocele repair, ventriculoperitoneal shunt). No surgical repair of serious congenital heart anomalies that require cardiopulmonary bypass and /or ECMO for medical conditions. Level IIID - Major surgery, surgical repair of serious congenital heart anomalies that require cardiopulmonary bypass, and/or ECMO for medical conditions.
Neonate	A patient who is an infant ≤ 30 days of age.
NHSN inpatient	A patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.
NHSN operative procedure	A procedure: 1) that is performed on a patient who is an NHSN inpatient or an NHSN outpatient 2) takes place during an operation where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the operating room, and 3) that is included in Table 1, Chapter 9.
NHSN outpatient	A patient whose date of admission to the healthcare facility and the date of discharge are the same day.
Non-autologous transplant	See Transplant
Operating room (OR)	A patient care area that meets the American Institute of Architects (AIA) criteria for an operating room[2]. This may include an operating room, C-Section room, interventional radiology room or a cardiac catheterization lab, among other areas.

Operation — A single trip to the operating room (OR) where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the OR.

Patient days — A daily count of the number of patients in the patient care location during a time period. To calculate patient days, for each day of the month, at the same time each day, record the number of patients. At the end of the month, sum the daily counts and enter the total into NHSN.

Permanent central line — A central line that is tunneled, including certain dialysis catheters and implantable catheters (including ports).

Post-procedure pneumonia (PPP) — A pneumonia that meets one of the criteria for pneumonia and occurs after an inpatient operation takes place but prior to discharge.

Secondary bloodstream infection (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 same organism and exhibit same antibiogram as the primary HAI site. For example, if blood culture is positive in a patient with a healthcare-associated UTI and organisms and antibiograms of both blood and urine specimens are identical, infection is reported as UTI with secondary BSI. Secondary BSI is not reported separately. If, on the other hand, an organ/space SSI is identified by CT scan and no culture is used to meet the criteria for SSI-GIT, and a blood culture grows *Bacteroides fragilis,* then the SSI-GIT is recorded as an SSI with a secondary BSI. The pathogen for the SSI is recorded as *Bacteroides fragilis.*

Specialty care area (SCA) — Hospital location in which specialized care of the following types is provided:

- Bone marrow transplant
- Solid organ transplant
- Inpatient acute dialysis
- Hematology/Oncology
- Long term acute care

SSI risk index — A score used to predict a surgical patient's risk of acquiring a surgical site infection. The risk index score, ranging from 0 to 3, is the number of risk factors present among the following:

- a patient with an American Society of Anesthesiologists' physical status classification score of 3, 4, or 5[1],
- an operation classified as contaminated or dirty infected[4], and
- an operation lasting longer than the duration cut point in minutes, where the duration cut point varies by the type of operative procedure performed. Current duration cut point values can be found in the most recent NHSN

Report.

Superficial incisional primary (SIP) SSI	A superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB).
Superficial incisional secondary (SIS) SSI	A superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site [leg] incision for CBGB).
Surveillance cultures	Those cultures reported as part of infection control surveillance such as stool cultures for vancomycin-resistant enterococci (VRE), not for use in patient diagnosis. Also called active surveillance cultures or testing.
Temporary central line	A central line that is not tunneled.
Transfer rule	If a device-associated infection develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location.
Transplant:	Human cells, tissues, organs, or cellular- or tissue-based products that are placed into a human recipient via grafting, infusion, or transfer. Examples include: heart valves, organs, ligaments, bone, skin, corneas, and bone marrow cells. • *Autologous* or "autograft" transplants are products that originate from the patient's own body. • *Non-autologous* or "allograft" transplants are tissues or other products derived from another human body, either a donor cadaver or a live donor.
Umbilical catheter	A central line inserted through the umbilical artery or vein in a neonate.
Vascular access infection	See Dialysis access-associated infection types.
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); continuous nasal positive airway pressure (CPAP, hypoCPAP) are not considered ventilators unless delivered via tracheostomy or endotracheal intubation (e.g., ET-CPAP).

Ventilator-associated Pneumonia (VAP)

A VAP is 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 PNEU. NOTE: There is no minimum period of time that the ventilator must be in place in order for the PNEU to be considered ventilator-associated.
See also Ventilator and Device-associated infection.

Wound Class

An assessment of the degree of contamination of a surgical wound at the time of the operation. The wound class system used in NHSN is an adaptation of the American College of Surgeons wound classification schema[4]. Wounds are divided into four classes:

Clean: An uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tracts are not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow nonpenetrating (blunt) trauma should be included in this category if they meet the criteria.

Clean-Contaminated: Operative wounds in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.

Contaminated: Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, nonpurulent inflammation is encountered are included in this category.

Dirty or Infected: Includes old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

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[1]Anonymous. New classification of physical status. Anesthesiology 1963;24:111.

[2]American Academy of Pediatrics, Policy Statement: Levels of neonatal care. Pediatrics, 2004;114 (5): 1341-1347.

[3] Facility Guidelines Institute et al., Guidelines for Design and Construction of Health Care Facilities, 2006 ed. (Washington: The American Institute of Architects, 2006).

[4] Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR, and the Hospital Infection Control Practices Advisory Committee. Guideline for prevention of surgical site infection, 1999. Infect Control Hosp Epidemiol 1999;20:247-80.

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

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

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

AJIC major articles

CDC/NHSN surveillance definition of health care–associated infection and criteria for specific types of infections in the acute care setting

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BACKGROUND

Since 1988, the Centers for Disease Control and Prevention (CDC) has published 2 articles in which nosocomial infection and criteria for specific types of nosocomial infection for surveillance purposes for use in acute care settings have been defined.[1,2] This document replaces those articles, which are now considered obsolete, and uses the generic term ''health care–associated infection'' or ''HAI'' instead of ''nosocomial.'' This document reflects the elimination of criterion 1 of clinical sepsis (effective in National Healthcare Safety Network [NHSN] facilities since January 2005) and criteria for laboratory–confirmed bloodstream infection (LCBI). Specifically for LCBI, criterion 2c and 3c, and 2b and 3b, were removed effective in NHSN facilities since January 2005 and January 2008, respectively. The definition of ''implant,'' which is part of the surgical site infection (SSI) criteria, has been slightly modified. No other infection criteria have been added, removed, or changed. There are also notes throughout this document that reflect changes in the use of surveillance criteria since the implementation of NHSN. For example, the population for which clinical sepsis is used has been restricted to patients ≤1 year old. Another example is that incisional SSI descriptions have been expanded to specify whether an SSI affects the primary or a secondary incision following operative procedures in which more than 1 incision is made. For additional information about how these criteria are used for NHSN surveillance, refer to the *NHSN Manual: Patient Safety Component Protocol* available at the NHSN Web site (www.cdc.gov/ncidod/dhqp/nhsn.html). Whenever revisions occur, they will be published and made available at the NHSN Web site.

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CDC/NHSN SURVEILLANCE DEFINITION OF HEALTH CARE–ASSOCIATED INFECTION

For the purposes of NHSN surveillance in the acute care setting, the CDC defines an HAI as 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.

HAIs 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.

Other important considerations include the following:

- Clinical evidence may be derived from direct observation of the infection site (eg, a wound) or

review of information in the patient chart or other clinical records.

- For certain types of infection, a physician or surgeon diagnosis of infection derived from direct observation during a surgical operation, endoscopic examination, or other diagnostic studies or from clinical judgment is an acceptable criterion for an HAI, unless there is compelling evidence to the contrary. For example, one of the criteria for SSI is ''surgeon or attending physician diagnosis.'' Unless stated explicitly, physician diagnosis alone is not an acceptable criterion for any specific type of HAI.
- Infections occurring in infants that result from passage through the birth canal are considered HAIs.
- The following infections are *not* considered health care associated:
  - Infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection;
  - infections in infants that have been acquired transplacentally (eg, herpes simplex, toxoplasmosis, rubella, cytomegalovirus, or syphilis) and become evident ≤48 hours after birth; and
  - reactivation of a latent infection (eg, herpes zoster [shingles], herpes simplex, syphilis, or tuberculosis).
- The following conditions are *not* infections:
  - Colonization, which means the presence of microorganisms on skin, on mucous membranes, in open wounds, or in excretions or secretions but are not causing adverse clinical signs or symptoms; and
  - inflammation that results from tissue response to injury or stimulation by noninfectious agents, such as chemicals.

CRITERIA FOR SPECIFIC TYPES OF INFECTION

Once an infection is deemed to be health care associated according to the definition shown above, the specific type of infection should be determined based on the criteria detailed below. These have been grouped into 13 major type categories to facilitate data analysis. For example, there are 3 specific types of urinary tract infections (symptomatic urinary tract infection, asymptomatic bacteriuria, and other infections of the urinary tract) that are grouped under the major type of Urinary Tract Infection. The specific and major types of infection used in NHSN and their abbreviated codes are listed in Table 1, and the criteria for each of the specific types of infection follow it.

USE OF THESE CRITERIA FOR PUBLICLY REPORTED HAI DATA

Not all infections or infection criteria may be appropriate for use in public reporting of HAIs. Guidance on what infections and infection criteria are recommended is available from other sources (eg, HICPAC [http://www.cdc.gov/ncidod/dhqp/hicpac_pubs.html]; National Quality Forum [http://www.qualityforum.org/]; professional organizations).

UTI-URINARY TRACT INFECTION

SUTI-Symptomatic urinary tract infection

A symptomatic urinary tract infection must meet at least *1* of the following criteria:

1. Patient has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, or suprapubic tenderness
   and
   patient has a positive urine culture, that is, $\geq 10^5$ microorganisms per cc of urine with no more than 2 species of microorganisms.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, or suprapubic tenderness
   and
   at least *1* of the following
   a. positive dipstick for leukocyte esterase and/or nitrate
   b. pyuria (urine specimen with ≥10 white blood cell [WBC]/mm^3 or ≥3 WBC/high-power field of unspun urine)
   c. organisms seen on Gram's stain of unspun urine
   d. at least *2* urine cultures with repeated isolation of the same uropathogen (gram-negative bacteria or *Staphylococcus saprophyticus*) with $\geq 10^2$ colonies/mL in nonvoided specimens
   e. $\leq 10^5$ colonies/mL of a single uropathogen (gram-negative bacteria or *S saprophyticus*) in a patient being treated with an effective antimicrobial agent for a urinary tract infection
   f. physician diagnosis of a urinary tract infection
   g. physician institutes appropriate therapy for a urinary tract infection.
3. Patient ≤1 year of age has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia

Table 1. CDC/NHSN major and specific types of health care–associated infections

UTI	**Urinary tract infection**	
	SUTI	Symptomatic urinary tract infection
	ASB	Asymptomatic bacteriuria
	OUTI	Other infections of the urinary tract
SSI	**Surgical site infection**	
	SIP	Superficial incisional primary SSI
	SIS	Superficial incisional secondary SSI
	DIP	Deep incisional primary SSI
	DIS	Deep incisional secondary SSI
	Organ/space	Organ/space SSI. Indicate specific type:
		• BONE • LUNG
		• BRST • MED
		• CARD • MEN
		• DISC • ORAL
		• EAR • OREP
		• EMET • OUTI
		• ENDO • SA
		• EYE • SINU
		• GIT • UR
		• IAB • VASC
		• IC • VCUF
		• JNT
BSI	**Bloodstream infection**	
	LCBI	Laboratory-confirmed bloodstream infection
	CSEP	Clinical sepsis
PNEU	**Pneumonia**	
	PNU1	Clinically defined pneumonia
	PNU2	Pneumonia with specific laboratory findings
	PNU3	Pneumonia in immunocompromised patient
BJ	**Bone and joint infection**	
	BONE	Osteomyelitis
	JNT	Joint or bursa
	DISC	Disc space
CNS	**Central nervous system**	
	IC	Intracranial infection
	MEN	Meningitis or ventriculitis
	SA	Spinal abscess without meningitis
CVS	**Cardiovascular system infection**	
	VASC	Arterial or venous infection
	ENDO	Endocarditis
	CARD	Myocarditis or pericarditis
	MED	Mediastinitis
EENT	**Eye, ear, nose, throat, or mouth infection**	
	CONJ	Conjunctivitis
	EYE	Eye, other than conjunctivitis
	EAR	Ear, mastoid
	ORAL	Oral cavity (mouth, tongue, or gums)
	SINU	Sinusitis
	UR	Upper respiratory tract, pharyngitis, laryngitis, epiglottitis
GI	**Gastrointestinal system infection**	
	GE	Gastroenteritis
	GIT	Gastrointestinal (GI) tract
	HEP	Hepatitis
	IAB	Intraabdominal, not specified elsewhere
	NEC	Necrotizing enterocolitis
LRI	**Lower respiratory tract infection, other than pneumonia**	
	BRON	Bronchitis, tracheobronchitis, tracheitis, without evidence of pneumonia
	LUNG	Other infections of the lower respiratory tract
REPR	**Reproductive tract infection**	
	EMET	Endometritis
	EPIS	Episiotomy
	VCUF	Vaginal cuff
	OREP	Other infections of the male or female reproductive tract
SST	**Skin and soft tissue infection**	
	SKIN	Skin
	ST	Soft tissue
	DECU	Decubitus ulcer
	BURN	Burn
	BRST	Breast abscess or mastitis
	UMB	Omphalitis
	PUST	Pustulosis
	CIRC	Newborn circumcision
SYS	**Systemic Infection**	
	DI	Disseminated infection

(<37°C rectal), apnea, bradycardia, dysuria, lethargy, or vomiting

and

patient has a positive urine culture, that is, $\geq 10^5$ microorganisms per cc of urine with no more than two species of microorganisms.

4. Patient ≤1 year of age has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), hypothermia (<37°C), apnea, bradycardia, dysuria, lethargy, or vomiting

and
at least *1* of the following:
a. positive dipstick for leukocyte esterase and/or nitrate
b. pyuria (urine specimen with $\geq$10 WBC/mm^3 or $\geq$3 WBC/high-power field of unspun urine)
c. organisms seen on Gram's stain of unspun urine
d. at least *2* urine cultures with repeated isolation of the same uropathogen (gram-negative bacteria or *S saprophyticus*) with $\geq 10^2$ colonies/mL in nonvoided specimens
e. $\leq 10^5$ colonies/mL of a single uropathogen (gram-negative bacteria or *S saprophyticus*) in a patient being treated with an effective antimicrobial agent for a urinary tract infection
f. physician diagnosis of a urinary tract infection
g. physician institutes appropriate therapy for a urinary tract infection.

ASB-Asymptomatic bacteriuria

An asymptomatic bacteriuria must meet at least *1* of the following criteria:

1. Patient has had an indwelling urinary catheter within 7 days before the culture
   and
   patient has a positive urine culture, that is, $\geq 10^5$ microorganisms per cc of urine with no more than 2 species of microorganisms
   and
   patient has no fever (>38°C), urgency, frequency, dysuria, or suprapubic tenderness.
2. Patient has *not* had an indwelling urinary catheter within 7 days before the first positive culture
   and
   patient has had at least 2 positive urine cultures, that is, $\geq 10^5$ microorganisms per cc of urine with repeated isolation of the same microorganism and no more than 2 species of microorganisms
   and
   patient has no fever (>38°C), urgency, frequency, dysuria, or suprapubic tenderness.

Comments

- A positive culture of a urinary catheter tip is *not* an acceptable laboratory test to diagnose a urinary tract infection.
- Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization.
- In infants, a urine culture should be obtained by bladder catheterization or suprapubic aspiration; a positive urine culture from a bag specimen is unreliable and should be confirmed by a specimen aseptically obtained by catheterization or suprapubic aspiration.

OUTI-Other infections of the urinary tract (kidney, ureter, bladder, urethra, or tissue surrounding the retroperitoneal or perinephric space)

Other infections of the urinary tract must meet at least *1* of the following criteria:

1. Patient has organisms isolated from culture of fluid (other than urine) or tissue from affected site.
2. Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination.
3. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site
   and
   at least *1* of the following:
   a. purulent drainage from affected site
   b. organisms cultured from blood that are compatible with suspected site of infection
   c. radiographic evidence of infection (eg, abnormal ultrasound, computerized tomography [CT] scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium], etc)
   d. physician diagnosis of infection of the kidney, ureter, bladder, urethra, or tissues surrounding the retroperitoneal or perinephric space
   e. physician institutes appropriate therapy for an infection of the kidney, ureter, bladder, urethra, or tissues surrounding the retroperitoneal or perinephric space.
4. Patient $\leq$1 year of age has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, lethargy, or vomiting
   and
   at least *1* of the following:
   a. purulent drainage from affected site
   b. organisms cultured from blood that are compatible with suspected site of infection

c. radiographic evidence of infection (eg, abnormal ultrasound, CT scan, MRI, or radiolabel scan [gallium, technetium])
d. physician diagnosis of infection of the kidney, ureter, bladder, urethra, or tissues surrounding the retroperitoneal or perinephric space
e. physician institutes appropriate therapy for an infection of the kidney, ureter, bladder, urethra, or tissues surrounding the retroperitoneal or perinephric space.

Reporting instruction

- Report infections following circumcision in newborns as CIRC.

SSI-SURGICAL SITE INFECTION

SIP/SIS-Superficial incisional surgical site infection

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 *1* of the following:

a. purulent drainage from the superficial incision
b. organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision
c. at least *1* of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat, *and* superficial incision is deliberately opened by surgeon and is culture positive or not cultured. A culture-negative finding does not meet this criterion.
d. diagnosis of superficial incisional SSI by the surgeon or attending physician.

There are 2 specific types of superficial incisional SSI:

- *Superficial incisional primary (SIP):* a superficial incisional SSI that is identified in the primary incision in a patient who has had an operation with 1 or more incisions (eg, C-section 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 who has had an operation with more than 1 incision (eg, donor site [leg] incision for CBGB).

Reporting instructions

- Do not report a stitch abscess (minimal inflammation and discharge confined to the points of suture penetration) as an infection.
- Do not report a localized stab wound infection as SSI, instead report as skin (SKIN), or soft tissue (ST), infection, depending on its depth.
- Report infection of the circumcision site in newborns as CIRC. Circumcision is not an NHSN operative procedure.
- Report infected burn wound as BURN.
- If the incisional site infection involves or extends into the fascial and muscle layers, report as a deep incisional SSI.
- Classify infection that involves both superficial and deep incision sites as deep incisional SSI.

DIP/DIS-Deep incisional surgical site infection

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

Infection occurs within 30 days after the operative procedure if no implant[1] is left in place or within 1 year if implant is in place and the infection appears to be related to the operative procedure
and
involves deep soft tissues (eg, fascial and muscle layers) of the incision
and
patient has at least *1* 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 *1* 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 reoperation, or by histopathologic or radiologic examination
d. diagnosis of a deep incisional SSI by a surgeon or attending physician.

There are 2 specific types of deep incisional SSI:

- *Deep incisional primary (DIP)*: a deep incisional SSI that is identified in a primary incision in a patient

[1] A nonhuman-derived object, material, or tissue (eg, prosthetic heart valve, nonhuman vascular graft, mechanical heart, or hip prosthesis) that is permanently placed in a patient during an operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes.

who has had an operation with one or more incisions (eg, C-section incision or chest incision for CBGB); and

- *Deep incisional secondary (DIS):* a deep incisional SSI that is identified in the secondary incision in a patient who has had an operation with more than 1 incision (eg, donor site [leg] incision for CBGB).

Reporting instruction

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

Organ/space-Organ/space surgical site infection

An organ/space SSI involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure. Specific sites are assigned to organ/space SSI to identify further the location of the infection. Listed below in reporting instructions are the specific sites that must be used to differentiate organ/space SSI. An example is appendectomy with subsequent subdiaphragmatic abscess, which would be reported as an organ/space SSI at the intraabdominal specific site (SSI-IAB).

An organ/space SSI must meet the following criterion:

Infection occurs within 30 days after the operative procedure if no implant[1] is left in place or within 1 year if implant is in place and the infection appears to be related to the operative procedure
and
infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure
and
patient has at least *1* of the following:

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

Reporting instructions

- Specific sites of organ/space SSI (see also criteria for these sites)

○ BONE
○ BRST
○ CARD
○ DISC
○ EAR
○ EMET
○ ENDO
○ EYE
○ GIT
○ IAB
○ IC
○ JNT
○ LUNG
○ MED
○ MEN
○ ORAL
○ OREP
○ OUTI
○ SA
○ SINU
○ UR
○ VASC
○ VCUF

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

BSI-BLOODSTREAM INFECTION

LCBI-Laboratory-confirmed bloodstream infection

LCBI criteria 1 and 2 may be used for patients of any age, including patients ≤1 year of age.

LCBI must meet at least *1* of the following criteria:

1. Patient has a recognized pathogen cultured from 1 or more blood cultures
   and
   organism cultured from blood is *not* related to an infection at another site. (See Notes 1 and 2.)
2. Patient has at least *1* 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 skin contaminant (ie, diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp) is cultured from *2* or more blood cultures drawn on separate occasions. (See Notes 3 and 4.)
3. Patient ≤1 year of age has at least *1* of the following signs or symptoms: fever (>38°C, rectal), hypothermia (<37°C, rectal), apnea, or bradycardia
   and
   signs and symptoms and positive laboratory results are *not* related to an infection at another site
   and
   common skin contaminant (ie, diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp) is cultured from *2* or more blood

cultures drawn on separate occasions. (See Notes 3 and 4.)

Notes

1. In criterion 1, the phrase ''1 or more blood cultures'' means that at least 1 bottle from a blood draw is reported by the laboratory as having grown organisms (ie, is a positive blood culture).
2. In criterion 1, the term ''recognized pathogen'' does *not* include organisms considered common skin contaminants (see criteria 2 and 3 for a list of common skin contaminants). A few of the recognized pathogens are *S aureus*, *Enterococcus* spp, *E coli*, *Pseudomonas* spp, *Klebsiella* spp, *Candida* spp, and others.
3. In criteria 2 and 3, the phrase ''*2* or more blood cultures drawn on separate occasions'' means (1) that blood from at least 2 blood draws were collected within 2 days of each other (eg, blood draws on Monday and Tuesday or Monday and Wednesday would be acceptable for blood cultures drawn on separate occasions, but blood draws on Monday and Thursday would be too far apart in time to meet this criterion) and (2) that at least 1 bottle from each blood draw is reported by the laboratory as having grown the same common skin contaminant organism (ie, is a positive blood culture). (See Note 4 for determining sameness of organisms.)
    a. For example, an adult patient has blood drawn at 8 AM and again at 8:15 AM of the same day. Blood from each blood draw is inoculated into 2 bottles and incubated (4 bottles total). If 1 bottle from each blood draw set is positive for coagulase-negative staphylococci, this part of the criterion is met.
    b. For example, a neonate has blood drawn for culture on Tuesday and again on Saturday, and both grow the same common skin contaminant. Because the time between these blood cultures exceeds the 2-day period for blood draws stipulated in criteria 2 and 3, this part of the criteria is *not* met.
    c. A blood culture may consist of a single bottle for a pediatric blood draw because of volume constraints. Therefore, to meet this part of the criterion, each bottle from 2 or more draws would have to be culture positive for the same skin contaminant.
4. There are several issues to consider when determining sameness of organisms.
    a. If the common skin contaminant is identified to the species level from 1 culture, and a companion culture is identified with only a descriptive name (ie, to the genus level), then it is assumed that the organisms are the same. The speciated organism should be reported as the infecting pathogen (see examples in Table 2).
    b. If common skin contaminant organisms from the cultures are speciated but no antibiograms are done or they are done for only 1 of the isolates, it is assumed that the organisms are the same.
    c. If the common skin contaminants from the cultures have antibiograms that are different for 2 or more antimicrobial agents, it is assumed that the organisms are *not* the same (see examples in Table 3).
    d. For the purpose of NHSN antibiogram reporting, the category interpretation of intermediate (I) should *not* be used to distinguish whether 2 organisms are the same.

Table 2. Examples of ''sameness'' by organism speciation

Culture	Companion Culture	Report as…
S epidermidis	*Coagulase-negative staphylococci*	*S epidermidis*
Bacillus spp (not *anthracis*)	*B cereus*	*B cereus*
S salivarius	*Strep* viridans	*S salivarius*

Table 3. Examples of ''sameness'' by organism antibiogram

Organism Name	Isolate A	Isolate B	Interpret as…
S epidermidis	All drugs **S**	All drugs **S**	Same
S epidermidis	OX **R** CEFAZ **R**	OX **S** CEFAZ **S**	Different
Corynebacterium spp	PENG **R** CIPRO **S**	PENG **S** CIPRO **R**	Different
Strep viridans	All drugs **S**	All drugs **S** except ERYTH **R**	Same

S, sensitive; **R**, resistant.

Specimen collection considerations

Ideally, blood specimens for culture should be obtained from 2 to 4 blood draws from separate venipuncture sites (eg, right and left antecubital veins), not through a vascular catheter. These blood draws should be performed simultaneously or over a short period of time (ie, within a few hours).[3,4] If your facility does not currently obtain specimens using this technique, you may still report BSIs using the criteria and notes above, but you should work with appropriate personnel to facilitate better specimen collection practices for blood cultures.

Reporting instructions

- Purulent phlebitis confirmed with a positive semiquantitative culture of a catheter tip, but with either negative or no blood culture is considered a CVS-VASC, not a BSI.
- Report organisms cultured from blood as BSI–LCBI when no other site of infection is evident.

CSEP-CLINICAL SEPSIS

CSEP may be used only to report primary BSI in neonates and infants. It is not used to report BSI in adults and children.

Clinical sepsis must meet the following criterion:

Patient ≤1 year of age has at least *1* of the following clinical signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, or bradycardia
and
blood culture *not* done or *no* organisms detected in blood
and
no apparent infection at another site
and
physician institutes treatment for sepsis.

Reporting instruction

- Report culture-positive infections of the bloodstream as BSI-LCBI.

PNEU-PNEUMONIA

See Appendix.

BJ–BONE AND JOINT INFECTION

BONE-Osteomyelitis

Osteomyelitis must meet at least *1* of the following criteria:

1. Patient has organisms cultured from bone.
2. Patient has evidence of osteomyelitis on direct examination of the bone during a surgical operation or histopathologic examination.
3. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), localized swelling, tenderness, heat, or drainage at suspected site of bone infection
   and
   at least *1* of the following:
   a. organisms cultured from blood
   b. positive blood antigen test (eg, *H influenzae*, *S pneumoniae*)
   c. radiographic evidence of infection (eg, abnormal findings on x-ray, CT scan, MRI, radiolabel scan [gallium, technetium, etc]).

Reporting instruction

- Report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as SSI-MED rather than SSI-BONE.

JNT-Joint or bursa

Joint or bursa infections must meet at least *1* of the following criteria:

1. Patient has organisms cultured from joint fluid or synovial biopsy.
2. Patient has evidence of joint or bursa infection seen during a surgical operation or histopathologic examination.
3. Patient has at least *2* of the following signs or symptoms with no other recognized cause: joint pain, swelling, tenderness, heat, evidence of effusion or limitation of motion
   and
   at least *1* of the following:
   a. organisms *and* white blood cells seen on Gram's stain of joint fluid
   b. positive antigen test on blood, urine, or joint fluid
   c. cellular profile and chemistries of joint fluid compatible with infection and *not* explained by an underlying rheumatologic disorder
   d. radiographic evidence of infection (eg, abnormal findings on x-ray, CT scan, MRI, radiolabel scan [gallium, technetium, etc]).

DISC-Disc space infection

Vertebral disc space infection must meet at least *1* of the following criteria:

1. Patient has organisms cultured from vertebral disc space tissue obtained during a surgical operation or needle aspiration.
2. Patient has evidence of vertebral disc space infection seen during a surgical operation or histopathologic examination.
3. Patient has fever (>38°C) with no other recognized cause or pain at the involved vertebral disc space
   and
   radiographic evidence of infection, (eg, abnormal findings on x-ray, CT scan, MRI, radiolabel scan [gallium, technetium, etc]).

4. Patient has fever (>38°C) with no other recognized cause and pain at the involved vertebral disc space
   and
   positive antigen test on blood or urine (eg, *H influenzae*, *S pneumoniae*, *N meningitidis*, or Group B *Streptococcus*).

CNS-CENTRAL NERVOUS SYSTEM INFECTION

IC-Intracranial infection (brain abscess, subdural or epidural infection, encephalitis)

Intracranial infection must meet at least *1* of the following criteria:

1. Patient has organisms cultured from brain tissue or dura.
2. Patient has an abscess or evidence of intracranial infection seen during a surgical operation or histopathologic examination.
3. Patient has at least *2* of the following signs or symptoms with no other recognized cause: headache, dizziness, fever (>38°C), localizing neurologic signs, changing level of consciousness, or confusion
   and
   at least *1* of the following:
   a. organisms seen on microscopic examination of brain or abscess tissue obtained by needle aspiration or by biopsy during a surgical operation or autopsy
   b. positive antigen test on blood or urine
   c. radiographic evidence of infection, (eg, abnormal findings on ultrasound, CT scan, MRI, radionuclide brain scan, or arteriogram)
   d. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
   and
   if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy.
4. Patient ≤1 year of age has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, localizing neurologic signs, or changing level of consciousness
   and
   at least *1* of the following:
   a. organisms seen on microscopic examination of brain or abscess tissue obtained by needle aspiration or by biopsy during a surgical operation or autopsy
   b. positive antigen test on blood or urine
   c. radiographic evidence of infection, (eg, abnormal findings on ultrasound, CT scan, MRI, radionuclide brain scan, or arteriogram)
   d. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
   and
   if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy.

Reporting instruction

- If meningitis and a brain abscess are present together, report the infection as IC.

MEN-Meningitis or ventriculitis

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

1. Patient has organisms cultured from cerebrospinal fluid (CSF).
2. Patient has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), headache, stiff neck, meningeal signs, cranial nerve signs, or irritability
   and
   at least *1* of the following:
   a. increased white cells, elevated protein, and/or decreased glucose in CSF
   b. organisms seen on Gram's stain of CSF
   c. organisms cultured from blood
   d. positive antigen test of CSF, blood, or urine
   e. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
   and
   if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy.
3. Patient ≤1 year of age has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, stiff neck, meningeal signs, cranial nerve signs, or irritability
   and
   at least 1 of the following:
   a. positive CSF examination with increased white cells, elevated protein, and/or decreased glucose
   b. positive Gram's stain of CSF
   c. organisms cultured from blood
   d. positive antigen test of CSF, blood, or urine
   e. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen

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

Reporting instructions

- Report meningitis in the newborn as health care-associated *unless* there is compelling evidence indicating the meningitis was acquired transplacentally.
- Report CSF shunt infection as SSI-MEN if it occurs ≤1 year of placement; if later or after manipulation/access of the shunt, report as CNS-MEN.
- Report meningoencephalitis as MEN.
- Report spinal abscess *with* meningitis as MEN.

SA-Spinal abscess without meningitis

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

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

Reporting instruction

- Report spinal abscess *with* meningitis as MEN.

CVS-CARDIOVASCULAR SYSTEM INFECTION

VASC-Arterial or venous infection

Arterial or venous infection must meet at least *1* of the following criteria:

1. Patient has organisms cultured from arteries or veins removed during a surgical operation
   and
   blood culture *not* done or *no* organisms cultured from blood.
2. Patient has evidence of arterial or venous infection seen during a surgical operation or histopathologic examination.
3. Patient has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), pain, erythema, or heat at involved vascular site
   and
   more than 15 colonies cultured from intravascular cannula tip using semiquantitative culture method
   and
   blood culture *not* done or *no* organisms cultured from blood.
4. Patient has purulent drainage at involved vascular site
   and
   blood culture *not* done or *no* organisms cultured from blood.
5. Patient ≤1 year of age has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, lethargy, or pain, erythema, or heat at involved vascular site
   and
   more than 15 colonies cultured from intravascular cannula tip using semiquantitative culture method
   and
   blood culture *not* done or *no* organisms cultured from blood.

Reporting instructions

- Report infections of an arteriovenous graft, shunt, or fistula or intravascular cannulation site without organisms cultured from blood as CVS-VASC.
- Report intravascular infections with organisms cultured from the blood as BSI-LCBI.

ENDO-Endocarditis

Endocarditis of a natural or prosthetic heart valve must meet at least *1* of the following criteria:

1. Patient has organisms cultured from valve or vegetation.
2. Patient has 2 or more of the following signs or symptoms with no other recognized cause: fever (>38°C), new or changing murmur, embolic phenomena, skin manifestations (ie, petechiae, splinter hemorrhages, painful subcutaneous nodules),

congestive heart failure, or cardiac conduction abnormality
and
at least *1* of the following:
a. organisms cultured from *2* or more blood cultures
b. organisms seen on Gram's stain of valve when culture is negative or *not* done
c. valvular vegetation seen during a surgical operation or autopsy
d. positive antigen test on blood or urine (eg, *H influenzae*, *S pneumoniae*, *N meningitidis*, or Group B *Streptococcus*)
e. evidence of new vegetation seen on echocardiogram
and
if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy.

3. Patient ≤1 year of age has *2* or more of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, new or changing murmur, embolic phenomena, skin manifestations (ie, petechiae, splinter hemorrhages, painful subcutaneous nodules), congestive heart failure, or cardiac conduction abnormality
and
at least *1* of the following:
a. organisms cultured from *2* or more blood cultures
b. organisms seen on Gram's stain of valve when culture is negative or *not* done
c. valvular vegetation seen during a surgical operation or autopsy
d. positive antigen test on blood or urine (eg, *H influenzae*, *S pneumoniae*, *N meningitidis*, or Group B *Streptococcus*)
e. evidence of new vegetation seen on echocardiogram
and
if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy.

CARD-Myocarditis or pericarditis

Myocarditis or pericarditis must meet at least *1* of the following criteria:

1. Patient has organisms cultured from pericardial tissue or fluid obtained by needle aspiration or during a surgical operation.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), chest pain, paradoxical pulse, or increased heart size
and
at least *1* of the following:
a. abnormal EKG consistent with myocarditis or pericarditis
b. positive antigen test on blood (eg, *H influenzae*, *S pneumoniae*)
c. evidence of myocarditis or pericarditis on histologic examination of heart tissue
d. 4-fold rise in type-specific antibody with or without isolation of virus from pharynx or feces
e. pericardial effusion identified by echocardiogram, CT scan, MRI, or angiography.
3. Patient ≤1 year of age has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, paradoxical pulse, or increased heart size
and
at least *1* of the following:
a. abnormal EKG consistent with myocarditis or pericarditis
b. positive antigen test on blood (eg, *H influenzae, S pneumoniae*)
c. histologic examination of heart tissue shows evidence of myocarditis or pericarditis
d. 4-fold rise in type-specific antibody with or without isolation of virus from pharynx or feces
e. pericardial effusion identified by echocardiogram, CT scan, MRI, or angiography.

Comment

- Most cases of postcardiac surgery or postmyocardial infarction pericarditis are not infectious.

MED-Mediastinitis

Mediastinitis must meet at least *1* of the following criteria:

1. Patient has organisms cultured from mediastinal tissue or fluid obtained during a surgical operation or needle aspiration.
2. Patient has evidence of mediastinitis seen during a surgical operation or histopathologic examination.
3. Patient has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), chest pain, or sternal instability
and
at least *1* of the following:
a. purulent discharge from mediastinal area
b. organisms cultured from blood or discharge from mediastinal area

c. mediastinal widening on x-ray.

4. Patient ≤1 year of age has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, or sternal instability
   and
   at least *1* of the following:
   a. purulent discharge from mediastinal area
   b. organisms cultured from blood or discharge from mediastinal area
   c. mediastinal widening on x-ray.

Reporting instruction

- Report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as SSI-MED rather than SSI-BONE.

EENT-EYE, EAR, NOSE, THROAT, OR MOUTH INFECTION

CONJ-Conjunctivitis

Conjunctivitis must meet at least *1* of the following criteria:

1. Patient has pathogens cultured from purulent exudate obtained from the conjunctiva or contiguous tissues, such as eyelid, cornea, meibomian glands, or lacrimal glands.
2. Patient has pain or redness of conjunctiva or around eye
   and
   at least *1* of the following:
   a. WBCs and organisms seen on Gram's stain of exudate
   b. purulent exudate
   c. positive antigen test (eg, ELISA or IF for *Chlamydia trachomatis*, herpes simplex virus, adenovirus) on exudate or conjunctival scraping
   d. multinucleated giant cells seen on microscopic examination of conjunctival exudate or scrapings
   e. positive viral culture
   f. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen.

Reporting instructions

- Report other infections of the eye as EYE.
- Do *not* report chemical conjunctivitis caused by silver nitrate ($AgNO_3$) as a health care–associated infection.
- Do *not* report conjunctivitis that occurs as a part of a more widely disseminated viral illness (such as measles, chickenpox, or a URI).

EYE-Eye, other than conjunctivitis

An infection of the eye, other than conjunctivitis, must meet at least *1* of the following criteria:

1. Patient has organisms cultured from anterior or posterior chamber or vitreous fluid.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause: eye pain, visual disturbance, or hypopyon
   and
   at least *1* of the following:
   a. physician diagnosis of an eye infection
   b. positive antigen test on blood (eg, *H influenzae*, *S pneumoniae*)
   c. organisms cultured from blood.

EAR-Ear mastoid

Ear and mastoid infections must meet at least *1* of the following criteria:

Otitis externa must meet at least *1* of the following criteria:

1. Patient has pathogens cultured from purulent drainage from ear canal.
2. Patient has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), pain, redness, or drainage from ear canal
   and
   organisms seen on Gram's stain of purulent drainage.

Otitis media must meet at least *1* of the following criteria:

1. Patient has organisms cultured from fluid from middle ear obtained by tympanocentesis or at surgical operation.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), pain in the eardrum, inflammation, retraction or decreased mobility of eardrum, or fluid behind eardrum.

Otitis interna must meet at least *1* of the following criteria:

1. Patient has organisms cultured from fluid from inner ear obtained at surgical operation.
2. Patient has a physician diagnosis of inner ear infection.

Mastoiditis must meet at least *1* of the following criteria:

1. Patient has organisms cultured from purulent drainage from mastoid.

2. Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), pain, tenderness, erythema, headache, or facial paralysis
   and
   at least *1* of the following:
   a. organisms seen on Gram's stain of purulent material from mastoid
   b. positive antigen test on blood.

ORAL-Oral cavity (mouth, tongue, or gums)

Oral cavity infections must meet at least *1* of the following criteria:

1. Patient has organisms cultured from purulent material from tissues of oral cavity.
2. Patient has an abscess or other evidence of oral cavity infection seen on direct examination, during a surgical operation, or during a histopathologic examination.
3. Patient has at least *1* of the following signs or symptoms with no other recognized cause: abscess, ulceration, or raised white patches on inflamed mucosa, or plaques on oral mucosa
   and
   at least *1* of the following:
   a. organisms seen on Gram's stain
   b. positive KOH (potassium hydroxide) stain
   c. multinucleated giant cells seen on microscopic examination of mucosal scrapings
   d. positive antigen test on oral secretions
   e. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
   f. physician diagnosis of infection and treatment with topical or oral antifungal therapy.

Reporting instruction

- Report health care–associated primary herpes simplex infections of the oral cavity as ORAL; recurrent herpes infections are *not* health care–associated.

SINU-Sinusitis

Sinusitis must meet at least *1* of the following criteria:

1. Patient has organisms cultured from purulent material obtained from sinus cavity.
2. Patient has at least *1* of the following signs or symptoms with no other recognized cause: fever (>38°C), pain or tenderness over the involved sinus, headache, purulent exudate, or nasal obstruction
   and
   at least *1* of the following:
   a. positive transillumination
   b. positive radiographic examination (including CT scan).

UR-Upper respiratory tract, pharyngitis, laryngitis, epiglottitis

Upper respiratory tract infections must meet at least *1* of the following criteria:

1. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), erythema of pharynx, sore throat, cough, hoarseness, or purulent exudate in throat
   and
   at least *1* of the following:
   a. organisms cultured from the specific site
   b. organisms cultured from blood
   c. positive antigen test on blood or respiratory secretions
   d. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
   e. physician diagnosis of an upper respiratory infection.
2. Patient has an abscess seen on direct examination, during a surgical operation, or during a histopathologic examination.
3. Patient ≤1 year of age has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), hypothermia (<37°C rectal), apnea, bradycardia, nasal discharge, or purulent exudate in throat
   and
   at least *1* of the following:
   a. organisms cultured from the specific site
   b. organisms cultured from blood
   c. positive antigen test on blood or respiratory secretions
   d. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen
   e. physician diagnosis of an upper respiratory infection.

GI-GASTROINTESTINAL SYSTEM INFECTION

GE-Gastroenteritis

Gastroenteritis must meet at least *1* of the following criteria:

1. Patient has an acute onset of diarrhea (liquid stools for more than 12 hours) with or without

vomiting or fever (>38°C) and no likely noninfectious cause (eg, diagnostic tests, therapeutic regimen other than antimicrobial agents, acute exacerbation of a chronic condition, or psychologic stress).
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause: nausea, vomiting, abdominal pain, fever (>38°C), or headache
   and
   at least *1* of the following:
   a. an enteric pathogen is cultured from stool or rectal swab
   b. an enteric pathogen is detected by routine or electron microscopy
   c. an enteric pathogen is detected by antigen or antibody assay on blood or feces
   d. evidence of an enteric pathogen is detected by cytopathic changes in tissue culture (toxin assay)
   e. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen.

GIT-Gastrointestinal tract (esophagus, stomach, small and large bowel, and rectum) excluding gastroenteritis and appendicitis

Gastrointestinal tract infections, excluding gastroenteritis and appendicitis, must meet at least *1* of the following criteria:

1. Patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause and compatible with infection of the organ or tissue involved: fever (>38°C), nausea, vomiting, abdominal pain, or tenderness
   and
   at least *1* of the following:
   a. organisms cultured from drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
   b. organisms seen on Gram's or KOH stain or multinucleated giant cells seen on microscopic examination of drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
   c. organisms cultured from blood
   d. evidence of pathologic findings on radiographic examination
   e. evidence of pathologic findings on endoscopic examination (eg, *Candida* esophagitis or proctitis).

HEP-Hepatitis

Hepatitis must meet the following criterion:

Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), anorexia, nausea, vomiting, abdominal pain, jaundice, or history of transfusion within the previous 3 months
and
at least *1* of the following:
   a. positive antigen or antibody test for hepatitis A, hepatitis B, hepatitis C, or delta hepatitis
   b. abnormal liver function tests (eg, elevated ALT/AST, bilirubin)
   c. cytomegalovirus (CMV) detected in urine or oropharyngeal secretions.

Reporting instructions

- Do *not* report hepatitis or jaundice of noninfectious origin (alpha-1 antitrypsin deficiency, etc).
- Do *not* report hepatitis or jaundice that results from exposure to hepatotoxins (alcoholic or acetaminophen-induced hepatitis, etc).
- Do *not* report hepatitis or jaundice that results from biliary obstruction (cholecystitis).

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

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

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

c. organisms cultured from blood *and* radiographic evidence of infection (eg, abnormal findings on ultrasound, CT scan, MRI, or radiolabel scans [gallium, technetium, etc] or on abdominal x-ray).

Reporting instruction

- Do *not* report pancreatitis (an inflammatory syndrome characterized by abdominal pain, nausea, and vomiting associated with high serum levels of pancreatic enzymes) unless it is determined to be infectious in origin.

NEC-Necrotizing enterocolitis

Necrotizing enterocolitis in infants must meet the following criterion:

Infant has at least *2* of the following signs or symptoms with no other recognized cause: vomiting, abdominal distention, or prefeeding residuals
and
persistent microscopic or gross blood in stools
and
at least *1* of the following abdominal radiographic abnormalities:

a. pneumoperitoneum
b. pneumatosis intestinalis
c. unchanging ''rigid'' loops of small bowel.

LRI-LOWER RESPIRATORY TRACT INFECTION, OTHER THAN PNEUMONIA

BRON-Bronchitis, tracheobronchitis, bronchiolitis, tracheitis, without evidence of pneumonia

Tracheobronchial infections must meet at least *1* of the following criteria:

1. Patient has *no* clinical or radiographic evidence of pneumonia
   and
   patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), cough, new or increased sputum production, rhonchi, wheezing
   and
   at least *1* of the following:
   a. positive culture obtained by deep tracheal aspirate or bronchoscopy
   b. positive antigen test on respiratory secretions.
2. Patient ≤1 year of age has *no* clinical or radiographic evidence of pneumonia
   and
   patient has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C rectal), cough, new or increased sputum production, rhonchi, wheezing, respiratory distress, apnea, or bradycardia
   and
   at least *1* of the following:
   a. organisms cultured from material obtained by deep tracheal aspirate or bronchoscopy
   b. positive antigen test on respiratory secretions
   c. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen.

Reporting instruction

- Do *not* report chronic bronchitis in a patient with chronic lung disease as an infection unless there is evidence of an acute secondary infection, manifested by change in organism.

LUNG-Other infections of the lower respiratory tract

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

1. Patient has organisms seen on smear or cultured from lung tissue or fluid, including pleural fluid.
2. Patient has a lung abscess or empyema seen during a surgical operation or histopathologic examination.
3. Patient has an abscess cavity seen on radiographic examination of lung.

Reporting instructions

- Report concurrent lower respiratory tract infection and pneumonia with the same organism(s) as PNEU.
- Report lung abscess or empyema without pneumonia as LUNG.

REPR-REPRODUCTIVE TRACT INFECTION

EMET-Endometritis

Endometritis must meet at least *1* of the following criteria:

1. Patient has organisms cultured from fluid or tissue from endometrium obtained during surgical operation, by needle aspiration, or by brush biopsy.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause: fever

(>38°C), abdominal pain, uterine tenderness, or purulent drainage from uterus.

Reporting instruction

- Report postpartum endometritis as a health care–associated infection *unless* the amniotic fluid is infected at the time of admission or the patient was admitted 48 hours after rupture of the membrane.

EPIS-Episiotomy

Episiotomy infections must meet at least *1* of the following criteria:

1. Postvaginal delivery patient has purulent drainage from the episiotomy.
2. Postvaginal delivery patient has an episiotomy abscess.

Comment

- Episiotomy is not considered an operative procedure in NHSN.

VCUF-Vaginal cuff

Vaginal cuff infections must meet at least 1 of the following criteria:

1. Posthysterectomy patient has purulent drainage from the vaginal cuff.
2. Posthysterectomy patient has an abscess at the vaginal cuff.
3. Posthysterectomy patient has pathogens cultured from fluid or tissue obtained from the vaginal cuff.

Reporting instruction

- Report vaginal cuff infections as SSI-VCUF.

OREP-Other infections of the male or female reproductive tract (epididymis, testes, prostate, vagina, ovaries, uterus, or other deep pelvic tissues, excluding endometritis or vaginal cuff infections)

Other infections of the male or female reproductive tract must meet at least *1* of the following criteria:

1. Patient has organisms cultured from tissue or fluid from affected site.
2. Patient has an abscess or other evidence of infection of affected site seen during a surgical operation or histopathologic examination.
3. Patient has *2* of the following signs or symptoms with no other recognized cause: fever (>38°C), nausea, vomiting, pain, tenderness, or dysuria
   and
   at least 1 of the following:
   a. organisms cultured from blood
   b. physician diagnosis.

Reporting instructions

- Report endometritis as EMET.
- Report vaginal cuff infections as VCUF.

SST-SKIN AND SOFT TISSUE INFECTION

SKIN-Skin

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

1. Patient has purulent drainage, pustules, vesicles, or boils.
2. Patient has at least *2* of the following signs or symptoms with no other recognized cause: pain or tenderness, localized swelling, redness, or heat
   and
   at least *1* of the following:
   a. organisms cultured from aspirate or drainage from affected site; if organisms are normal skin flora (ie, diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp), they must be a pure culture
   b. organisms cultured from blood
   c. positive antigen test performed on infected tissue or blood (eg, herpes simplex, varicella zoster, *H influenzae*, *N meningitidis*)
   d. multinucleated giant cells seen on microscopic examination of affected tissue
   e. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen.

Reporting instructions

- Report omphalitis in infants as UMB.
- Report infections of the circumcision site in newborns as CIRC.
- Report pustules in infants as PUST.
- Report infected decubitus ulcers as DECU.
- Report infected burns as BURN.
- Report breast abscesses or mastitis as BRST.

ST-Soft tissue (necrotizing fascitis, infectious gangrene, necrotizing cellulitis, infectious myositis, lymphadenitis, or lymphangitis)

Soft tissue infections must meet at least *1* of the following criteria:

1. Patient has organisms cultured from tissue or drainage from affected site.
2. Patient has purulent drainage at affected site.
3. Patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination.
4. Patient has at least *2* of the following signs or symptoms at the affected site with no other recognized cause: localized pain or tenderness, redness, swelling, or heat
   and
   at least *1* of the following:
   a. organisms cultured from blood
   b. positive antigen test performed on blood or urine (eg, *H influenzae*, *S pneumoniae*, *N meningitidis*, Group B *Streptococcus*, *Candida* spp)
   c. diagnostic single antibody titer (IgM) or 4-fold increase in paired sera (IgG) for pathogen.

Reporting instructions

- Report infected decubitus ulcers as DECU.
- Report infection of deep pelvic tissues as OREP.

DECU-Decubitus ulcer, including both superficial and deep infections

Decubitus ulcer infections must meet the following criterion:

Patient has at least *2* of the following signs or symptoms with no other recognized cause: redness, tenderness, or swelling of decubitus wound edges
and
at least *1* of the following:

a. organisms cultured from properly collected fluid or tissue (see Comments)
b. organisms cultured from blood.

Comments

- Purulent drainage alone is *not* sufficient evidence of an infection.
- Organisms cultured from the surface of a decubitus ulcer are *not* sufficient evidence that the ulcer is infected. A properly collected specimen from a decubitus ulcer involves needle aspiration of fluid or biopsy of tissue from the ulcer margin.

BURN-Burn

Burn infections must meet at least *1* of the following criteria:

1. Patient has a change in burn wound appearance or character, such as rapid eschar separation, or dark brown, black, or violaceous discoloration of the eschar, or edema at wound margin
   and
   histologic examination of burn biopsy shows invasion of organisms into adjacent viable tissue.
2. Patient has a change in burn wound appearance or character, such as rapid eschar separation, or dark brown, black, or violaceous discoloration of the eschar, or edema at wound margin
   and
   at least *1* of the following:
   a. organisms cultured from blood in the absence of other identifiable infection
   b. isolation of herpes simplex virus, histologic identification of inclusions by light or electron microscopy, or visualization of viral particles by electron microscopy in biopsies or lesion scrapings.
3. Patient with a burn has at least *2* of the following signs or symptoms with no other recognized cause: fever (>38°C) or hypothermia (<36°C), hypotension, oliguria (<20 cc/hr), hyperglycemia at previously tolerated level of dietary carbohydrate, or mental confusion
   and
   at least *1* of the following:
   a. histologic examination of burn biopsy shows invasion of organisms into adjacent viable tissue
   b. organisms cultured from blood
   c. isolation of herpes simplex virus, histologic identification of inclusions by light or electron microscopy, or visualization of viral particles by electron microscopy in biopsies or lesion scrapings.

Comments

- Purulence alone at the burn wound site is *not* adequate for the diagnosis of burn infection; such purulence may reflect incomplete wound care.
- Fever alone in a burn patient is *not* adequate for the diagnosis of a burn infection because fever may be the result of tissue trauma or the patient may have an infection at another site.
- Surgeons in Regional Burn Centers who take care of burn patients exclusively may require Criterion 1 for diagnosis of burn infection.

- Hospitals with Regional Burn Centers may further divide burn infections into the following: burn wound site, burn graft site, burn donor site, burn donor site-cadaver; NHSN, however, will code all of these as BURN.

BRST-Breast abscess or mastitis

A breast abscess or mastitis must meet at least *1* of the following criteria:

1. Patient has a positive culture of affected breast tissue or fluid obtained by incision and drainage or needle aspiration.
2. Patient has a breast abscess or other evidence of infection seen during a surgical operation or histopathologic examination.
3. Patient has fever (>38°C) and local inflammation of the breast
   and
   physician diagnosis of breast abscess.

Comment

- Breast abscesses occur most frequently after childbirth. Those that occur within 7 days after childbirth should be considered health care associated.

UMB-Oomphalitis

Omphalitis in a newborn (≤30 days old) must meet at least *1* of the following criteria:

1. Patient has erythema and/or serous drainage from umbilicus
   and
   at least *1* of the following:
   a. organisms cultured from drainage or needle aspirate
   b. organisms cultured from blood.
2. Patient has both erythema and purulence at the umbilicus.

Reporting instructions

- Report infection of the umbilical artery or vein related to umbilical catheterization as VASC if there is no accompanying blood culture or a blood culture is negative.
- Report as health care associated if infection occurs in a newborn within 7 days of hospital discharge.

PUST-Infant pustulosis

Pustulosis in an infant (≤1 year old) must meet at least *1* of the following criteria:

1. Infant has *1* or more pustules
   and
   physician diagnosis of skin infection.
2. Infant has *1* or more pustules
   and
   physician institutes appropriate antimicrobial therapy.

Reporting instructions

- Do *not* report erythema toxicum and noninfectious causes of pustulosis.
- Report as health care associated if pustulosis occurs in an infant within 7 days of hospital discharge.

CIRC-Newborn circumcision

Circumcision infection in a newborn (≤30 days old) must meet at least *1* of the following criteria:

1. Newborn has purulent drainage from circumcision site.
2. Newborn has at least *1* of the following signs or symptoms with no other recognized cause at circumcision site: erythema, swelling, or tenderness
   and
   pathogen cultured from circumcision site.
3. Newborn has at least *1* of the following signs or symptoms with no other recognized cause at circumcision site: erythema, swelling, or tenderness
   and
   skin contaminant (ie, diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp) is cultured from circumcision site
   and
   physician diagnosis of infection or physician institutes appropriate therapy.

SYS-SYSTEMIC INFECTION

DI-Disseminated infection

Disseminated infection is infection involving multiple organs or systems, without an apparent single site of infection, usually of viral origin, and with signs or symptoms with no other recognized cause and compatible with infectious involvement of multiple organs or systems.

Reporting instructions

- Use this code for viral infections involving multiple organ systems (eg, measles, mumps, rubella, varicella, erythema infectiosum). These infections often can be identified by clinical criteria alone. Do *not* use this code for health care–associated

infections with multiple metastatic sites, such as with bacterial endocarditis; only the primary site of these infections should be reported.
- Do *not* report fever of unknown origin (FUO) as DI.
- Report neonatal ''sepsis'' as CSEP.
- Report viral exanthems or rash illness as DI.

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APPENDIX. PNEU-PNEUMONIA

There are 3 specific types of pneumonia: clinically defined pneumonia (PNU1), pneumonia with specific laboratory findings (PNU2), and pneumonia in immunocompromised patients (PNU3). Listed below are general comments applicable to all specific types of pneumonia, along with abbreviations used in the algorithms (Tables 4-7) and reporting instructions. Table 8 shows threshold values for cultured specimens used in the surveillance diagnosis of pneumonia. Figures 1 and 2 are flow diagrams for the pneumonia algorithms that may be used as data collection tools.

General comments

1. Physician diagnosis of pneumonia alone is not an acceptable criterion for health care–associated pneumonia.
2. Although specific criteria are included for infants and children, pediatric patients may meet any of the other pneumonia specific site criteria.
3. Ventilator-associated pneumonia (ie, pneumonia in persons who had a device to assist or control respiration continuously through a tracheostomy or by endotracheal intubation within the 48-hour period before the onset of infection, inclusive of the weaning period) should be so designated when reporting data.
4. When assessing a patient for presence of pneumonia, it is important to distinguish between changes in clinical status due to other conditions such as myocardial infarction, pulmonary embolism, respiratory distress syndrome, atelectasis, malignancy, chronic obstructive pulmonary disease, hyaline membrane disease, bronchopulmonary dysplasia, etc. Also, care must be taken when assessing intubated patients to distinguish between tracheal colonization, upper respiratory tract infections (eg, tracheobronchitis), and early onset pneumonia. Finally, it should be recognized that it may be difficult to determine health care–associated pneumonia in the elderly, infants, and immunocompromised patients because such conditions may mask typical signs or symptoms associated with pneumonia. Alternate specific criteria for the elderly, infants and immunocompromised patients have been included in this definition of health care–associated pneumonia.
5. Health care–associated pneumonia can be characterized by its onset: early or late. Early onset pneumonia occurs during the first 4 days of hospitalization and is often caused by *Moraxella catarrhalis, H influenzae*, and *S pneumoniae*. Causative agents of late onset pneumonia are frequently gram negative bacilli or *S aureus*, including methicillin-resistant *S aureus*. Viruses (eg, influenza A and B or respiratory syncytial virus) can cause early and late onset nosocomial pneumonia, whereas yeasts, fungi, legionellae, and *Pneumocystis carinii* are usually pathogens of late onset pneumonia.
6. Pneumonia due to gross aspiration (for example, in the setting of intubation in the emergency room or operating room) is considered health care associated if it meets any specific criteria and was not clearly present or incubating at the time of admission to the hospital.
7. Multiple episodes of health care–associated pneumonia may occur in critically ill patients with lengthy hospital stays. When determining whether to report multiple episodes of health care–associated pneumonia in a single patient, look for evidence of resolution of the initial infection. The addition of or change in pathogen alone is not indicative of a new episode of pneumonia. The combination of new signs and symptoms and radiographic evidence or other diagnostic testing is required.
8. Positive Gram stain for bacteria and positive KOH (potassium hydroxide) mount for elastin fibers and/or fungal hyphae from appropriately collected sputum specimens are important clues that point toward the etiology of the infection. However, sputum samples are frequently contaminated with airway colonizers and therefore must be interpreted cautiously. In particular, *Candida* is commonly seen on stain, but infrequently causes healthcare-associated pneumonia.

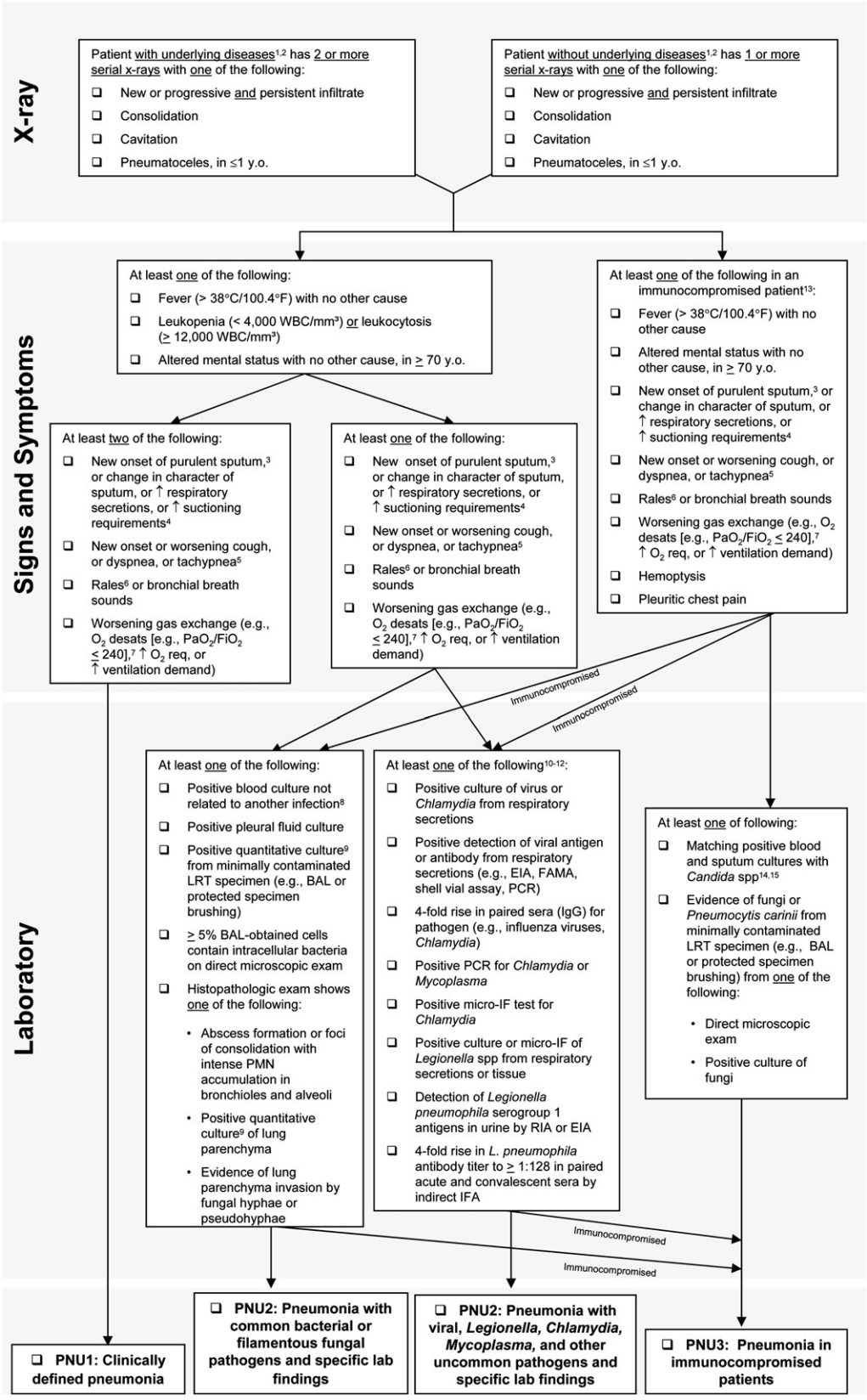

Fig 1. Pneumonia flow diagram.

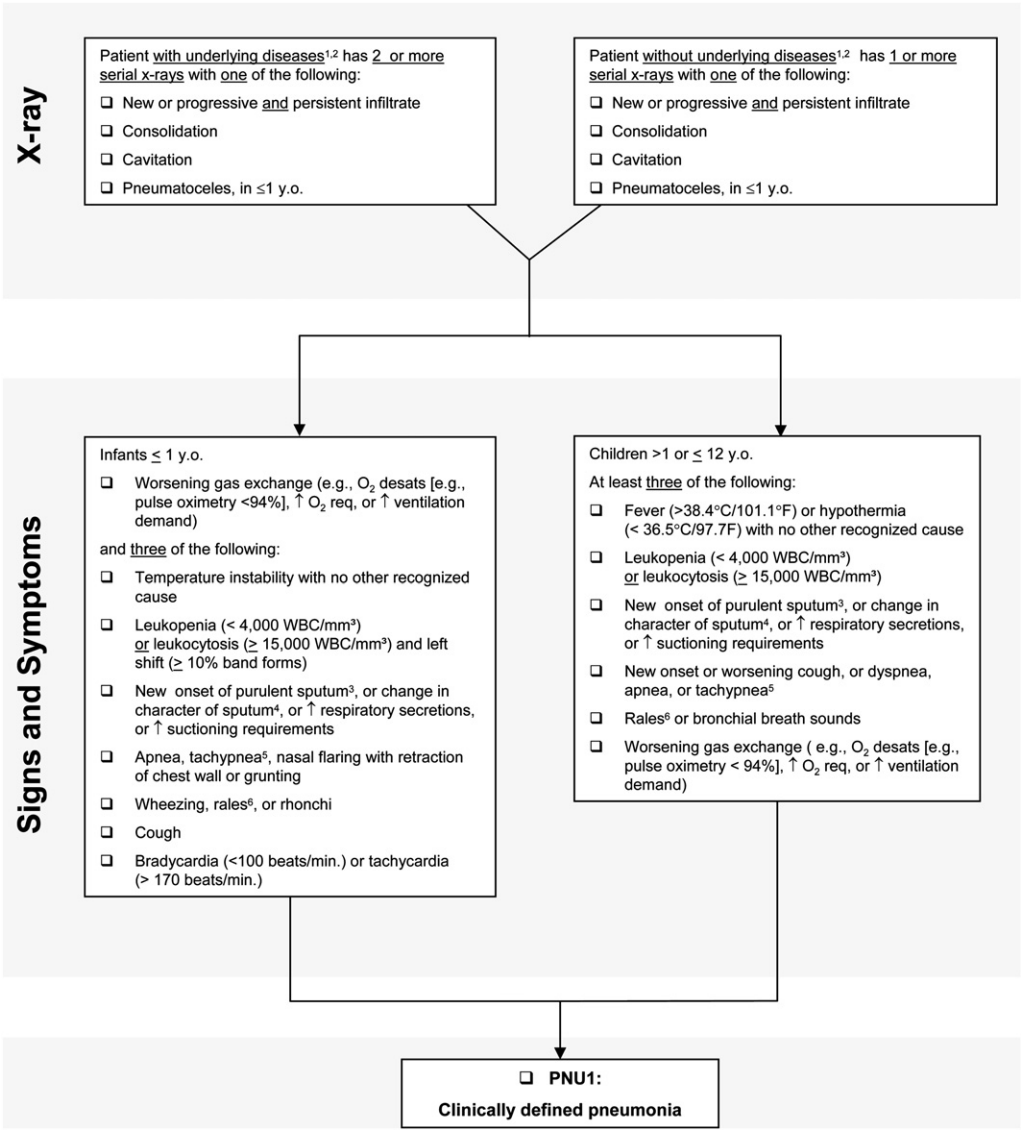

Fig 2. Pneumonia flow diagram alternate criteria for infants and children.

Abbreviations

BAL–bronchoalveolar lavage
EIA–enzyme immunoassay
FAMA–fluorescent-antibody staining of membrane antigen
IFA–immunofluorescent antibody
LRT–lower respiratory tract
PCR–polymerase chain reaction
PMN–polymorphonuclear leukocyte
RIA–radioimmunoassay

Reporting instructions

- There is a hierarchy of specific categories within the major type pneumonia (PNEU). Even if a patient meets criteria for more than 1 specific site, report only 1:
  - If a patient meets criteria for both PNU1 and PNU2, report PNU2.
  - If a patient meets criteria for both PNU2 and PNU3, report PNU3.
  - If a patient meets criteria for both PNU1 and PNU3, report PNU3.
- Report concurrent lower respiratory tract infection (eg, abscess or empyema) and pneumonia with the same organism(s) as pneumonia.
- Lung abscess or empyema *without* pneumonia are classified as LUNG.
- Bronchitis, tracheitis, tracheobronchitis, or bronchiolitis *without* pneumonia are classified as BRON.

Table 4. Algorithms for clinically defined pneumonia (PNU1)

Radiology	Signs/Symptoms
Two or more serial chest radiographs with at least 1 of the following[1,2]: • New or progressive and persistent infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤1 year old NOTE: In patients without underlying pulmonary or cardiac disease (eg, respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), 1 definitive chest radiograph is acceptable.[1]	FOR ANY PATIENT, at least 1 of the following: • Fever (>38°C or >100.4°F) with no other recognized cause • Leukopenia (<4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause *and* at least 2 of the following: • New onset of purulent sputum[3] or change in character of sputum[4] or increased respiratory secretions or increased suctioning requirements • New onset or worsening cough, or dyspnea, or tachypnea[5] • Rales[6] or bronchial breath sounds • Worsening gas exchange (eg, O_2 desaturations [eg, PaO_2/FiO_2 ≤240],[7] increased oxygen requirements, or increased ventilator demand) ALTERNATE CRITERIA, for infants ≤1 year old: Worsening gas exchange (eg, O_2 desaturations, increased oxygen requirements, or increased ventilator demand) *and* at least 3 of the following: • Temperature instability with no other recognized cause • Leukopenia (<4000 WBC/mm^3) *or* leukocytosis (≥15,000 WBC/mm^3) and left shift (≥10% band forms) • New onset of purulent sputum[3] or change in character of sputum,[4] or increased respiratory secretions or increased suctioning requirements • Apnea, tachypnea,[5] nasal flaring with retraction of chest wall or grunting • Wheezing, rales,[6] or rhonchi • Cough • Bradycardia (<100 beats/min) or tachycardia (>170 beats/min) ALTERNATE CRITERIA, for child >1 year old or ≤12 years old, at least *3* 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/mm^3) or leukocytosis (≥15,000 WBC/mm^3) • New onset of purulent sputum[3] or change in character of sputum[4] or increased respiratory secretions or increased suctioning requirements • New onset or worsening cough or dyspnea, apnea, or tachypnea[5] • Rales[6] or bronchial breath sounds • Worsening gas exchange (eg, O_2 desaturations [eg, pulse oximetry <94%], increased oxygen requirements, or increased ventilator demand)

Footnotes to Algorithms:

1. Occasionally, in nonventilated patients, the diagnosis of health care–associated pneumonia may be quite clear on the basis of symptoms, signs, and a single definitive chest radiograph. However, in patients with pulmonary or cardiac disease (for example, interstitial lung disease or congestive heart failure), the diagnosis of pneumonia may be particularly difficult. Other noninfectious conditions (for example, pulmonary edema from decompensated congestive heart failure) may simulate the presentation of pneumonia. In these more difficult cases, serial chest radiographs must be examined to help separate infectious from noninfectious pulmonary processes. To help confirm difficult cases, it may be useful to review radiographs on the day of diagnosis, 3 days prior to the diagnosis and on days 2 and 7 after the diagnosis. Pneumonia may have rapid onset and progression, but does not resolve quickly. Radiographic changes of pneumonia persist for several weeks. As a result, rapid radiographic resolution suggests that the patient does *not* have pneumonia but rather a noninfectious process such as atelectasis or congestive heart failure.
2. Note that there are many ways of describing the radiographic appearance of pneumonia. Examples include, but are not limited to, "air-space disease," "focal opacification," "patchy areas of increased density." Although perhaps not specifically delineated as pneumonia by the radiologist, in the appropriate clinical setting these alternative descriptive wordings should be seriously considered as potentially positive findings.
3. Purulent sputum is defined as secretions from the lungs, bronchi, or trachea that contain ≥25 neutrophils and ≤10 squamous epithelial cells per low power field (x100). If your laboratory reports these data qualitatively (eg, "many WBCs" or "few squames"), be sure their descriptors match this definition of purulent sputum. This laboratory confirmation is required because written clinical descriptions of purulence are highly variable.
4. A single notation of either purulent sputum or change in character of the sputum is not meaningful; repeated notations over a 24-hour period would be more indicative of the onset of an infectious process. Change in character of sputum refers to the color, consistency, odor, and quantity.

Table 5. Algorithms for pneumonia with common bacterial or filamentous fungal pathogens and specific laboratory findings (PNU2)

Radiology	Signs/Symptoms	Laboratory
Two or more serial chest radiographs with at least 1 of the following[1,2]: • New or progressive *and* persistent infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤1 year old NOTE: In patients without underlying pulmonary or cardiac disease (eg, respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), *1 definitive* chest radiograph is acceptable.[1]	At least 1 of the following: • Fever (>38°C or >100.4°F) with no other recognized cause • Leukopenia (<4000 WBC/mm^3) *or* leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause *and* at least 1 of the following: • New onset of purulent sputum[3] or change in character of sputum[4] or increased respiratory secretions or increased suctioning requirements • New onset or worsening cough or dyspnea or tachypnea[5] • Rales[6] or bronchial breath sounds • Worsening gas exchange (eg, O_2 desaturations [eg, PaO_2/FiO_2 ≤240][7], increased oxygen requirements, or increased ventilator demand)	At least 1 of the following: • Positive growth in blood culture[8] not related to another source of infection • Positive growth in culture of pleural fluid • Positive quantitative culture[9] from minimally contaminated LRT specimen (eg, BAL or protected specimen brushing) • ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (eg, Gram stain) • Histopathologic exam shows at least 1 of the following evidences of pneumonia: • Abscess formation or foci of consolidation with intense PMN accumulation in bronchioles and alveoli • Positive quantitative culture[9] of lung parenchyma • Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae

Table 6. Algorithms for pneumonia with viral, *Legionella, Chlamydia, Mycoplasma*, and other uncommon pathogens and specific laboratory findings (PNU2)

Radiology	Signs/Symptoms	Laboratory
Two or more serial chest radiographs with at least 1 of the following[1,2]: • New or progressive *and* persistent infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤1 year old NOTE: In patients without underlying pulmonary or cardiac disease (eg, respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), *1 definitive* chest radiograph is acceptable.[1]	At least 1 of the following: • Fever (>38°C or >100.4°F) with no other recognized cause • Leukopenia (<4000 WBC/mm^3) *or* leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause *and* at least 1 of the following: • New onset of purulent sputum[3] or change in character of sputum[4] or increased respiratory secretions or increased suctioning requirements • New onset or worsening cough or dyspnea or tachypnea[5] • Rales[6] or bronchial breath sounds • Worsening gas exchange (eg, O_2 desaturations [eg, PaO_2/FiO_2 ≤240],[7] increased oxygen requirements, or increased ventilator demand)	At least 1 of the following[10-12]: • Positive culture of virus or *Chlamydia* from respiratory secretions • Positive detection of viral antigen or antibody from respiratory secretions (eg, EIA, FAMA, shell vial assay, PCR) • Four-fold rise in paired sera (IgG) for pathogen (eg, influenza viruses, *Chlamydia*) • Positive PCR for *Chlamydia* or *Mycoplasma* • Positive micro-IF test for *Chlamydia* • Positive culture or visualization by micro-IF of *Legionella* spp, from respiratory secretions or tissue • Detection of *Legionella pneumophila* serogroup 1 antigens in urine by RIA or EIA • Four-fold rise in *L pneumophila* serogroup 1 antibody titer to ≥1:128 in paired acute and convalescent sera by indirect IFA

5. In adults, tachypnea is defined as respiration rate >25 breaths per minute. Tachypnea is defined as >75 breaths per minute in premature infants born at <37 weeks gestation and until the 40th week; >60 breaths per minute in infants <2 months old; >50 breaths per minute in infants 2 to 12 months old; and >30 breaths per minute in children >1 year old.
6. Rales may be described as "crackles."
7. This measure of arterial oxygenation is defined as the ratio of the arterial tension (PaO_2) to the inspiratory fraction of oxygen (FiO_2).
8. Care must be taken to determine the etiology of pneumonia in a patient with positive blood cultures and radiographic evidence of pneumonia, especially if the patient has invasive devices in place such as intravascular lines or an indwelling urinary catheter. In general, in an immunocompetent patient, blood cultures positive for coagulase-negative staphylococci, common skin contaminants, and yeasts will not be the etiologic agent of the pneumonia.
9. Refer to threshold values for cultured specimens (Table 8). An endotracheal aspirate is not a minimally contaminated specimen. Therefore, an endotracheal aspirate does not meet the laboratory criteria.
10. Once laboratory-confirmed due to pneumonia because of respiratory syncytial virus (RSV), adenovirus, or influenza virus have been identified in a hospital, clinician's presumptive diagnosis of these pathogens in subsequent cases with similar clinical signs and symptoms is an acceptable criterion for presence of health care–associated infection.

Table 7. Algorithms for pneumonia in immunocompromised patients (PNU3)

Radiology	Signs/Symptoms	Laboratory
Two or more serial chest radiographs with at least 1 of the following[1,2]: • New or progressive *and* persistent infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤1 year old NOTE: In patients without underlying pulmonary or cardiac disease (eg, respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), 1 *definitive* chest radiograph is acceptable.[1]	Patient who is immunocompromised[13] has at least 1 of the following: • Fever (>38°C or >100.4°F) with no other recognized cause • For adults ≥70 years old, altered mental status with no other recognized cause • New onset of purulent sputum[3] or change in character of sputum[4] or increased respiratory secretions or increased suctioning requirements • New onset or worsening cough or dyspnea or tachypnea[5] • Rales[6] or bronchial breath sounds • Worsening gas exchange (eg, O_2 desaturations [eg, PaO_2/FiO_2 ≤240],[7] increased oxygen requirements, or increased ventilator demand) • Hemoptysis • Pleuritic chest pain	At least 1 of the following: • Matching positive blood and sputum cultures with *Candida* spp[14,15] • Evidence of fungi or *Pneumocystis carinii* from minimally contaminated LRT specimen (eg, BAL or protected specimen brushing) from 1 of the following: ○ Direct microscopic exam ○ Positive culture of fungi • Any of the laboratory criteria defined under PNU2

11. Scant or watery sputum is commonly seen in adults with pneumonia due to viruses and *Mycoplasma* although sometimes the sputum may be mucopurulent. In infants, pneumonia due to RSV or influenza yields copious sputum. Patients, except premature infants, with viral or *Mycoplasmal* pneumonia may exhibit few signs or symptoms, even when significant infiltrates are present on radiographic exam.
12. Few bacteria may be seen on stains of respiratory secretions from patients with pneumonia due to *Legionella* spp, mycoplasma, or viruses.
13. Immunocompromised patients include those with neutropenia (absolute neutrophil count <500/mm^3), leukemia, lymphoma, HIV with CD4 count <200, or splenectomy; those who are early posttransplantation, are on cytotoxic chemotherapy, or are on high-dose steroids (e.g., >40mg of prednisone or its equivalent [>160mg hydrocortisone, >32mg methylprednisolone, >6mg dexamethasone, >200mg cortisone] daily for >2weeks).
14. Blood and sputum specimens must be collected within 48 hours of each other.
15. Semiquantitative or nonquantitative cultures of sputum obtained by deep cough, induction, aspiration, or lavage are acceptable. If quantitative culture results are available, refer to algorithms that include such specific laboratory findings.

Table 8. Threshold values for cultured specimens used in the diagnosis of pneumonia

Specimen collection/technique	Values
Lung parenchyma*	≥10^4 cfu/g tissue
Bronchoscopically obtained specimens	
Bronchoalveolar lavage	≥10^4 cfu/mL
Protected BAL	≥10^4 cfu/mL
Protected specimen brushing	≥10^4 cfu/mL
Nonbronchoscopically obtained (blind) specimens	
Bronchoalveolar lavage	≥10^4 cfu/mL
Protected BAL	≥10^4 cfu/mL

cfu, colony-forming units.
*Open-lung biopsy specimens and immediate post-mortem specimens obtained by transthoracic or transbronchial biopsy.

Table 1-Urinary Tract Infection Criteria	
Criterion	**Symptomatic Urinary Tract Infection (SUTI)** Must meet at least 1 of the following criteria:
1a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms.
1b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
2a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram stain of unspun urine

	and a positive urine culture of $\geq 10_3$ and $<10_5$ CFU/ml with no more than 2 species of microorganisms.
2b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥ 10 WBC/mm_3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.
3	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
4	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* a positive urinalysis demonstrated by at least one of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥ 10 WBC/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of between $\geq 10^3$ and $<10^5$ CFU/ml with no more than two species of microorganisms.
Criterion	**Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)**
	Patient with or without an indwelling urinary catheter has no signs or symptoms (i.e., no fever (>38°C) for patients ≤65 years of age*; and for any age patient no urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness, OR for a patient ≤1 year of age, no fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting) *and* a positive urine culture of $>10^5$ CFU/ml with no more than 2 species of uropathogen microorganisms** *and* a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture. *Fever is not diagnostic for UTI in the elderly (>65 years of age) and therefore fever in this age group does not disqualify from meeting the criteria of an ABUTI. **Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*, and *Corynebacterium* (urease positive).

Comments	• Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection. • Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization. Specimens from indwelling catheters should be aspirated through the disinfected sampling ports. • In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by catheterization or suprapubic aspiration. • 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. • Urine specimen labels should indicate whether or not the patient is symptomatic. • Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI). • Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified* (COS) or, as *C. urealyticum (CORUR) if so speciated.*
Criterion	**Other Urinary Tract Infection (OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperineal or perinephric space)** Other infections of the urinary tract must meet at least 1 of the following criteria:
1	Patient has microorganisms isolated from culture of fluid (other than urine) or tissue from affected site.
2	Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination.
3	Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
4	Patient < 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, lethargy, or vomiting *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection, (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
Comment	• Report infections following circumcision in newborns as SST-CIRC.