National Healthcare Safety Network (NHSN) Overview

The NHSN is a secure, Internet-based surveillance system that expands and 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). In addition, facilities that participate in certain reporting programs operated by the Centers for Medicare and Medicaid Services (CMS) can do so through use of NHSN. 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.

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, trends and coverage of healthcare personnel safety and vaccination, and adverse events related to the transfusion of blood and blood products.

The NHSN includes three components: Patient Safety, Healthcare Personnel Safety, and Biovigilance (Figure 1).

Figure 1: NHSN Components

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:
  - CLABS1 - 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 Organism/Clostridium difficile Infection (MDRO/CDI) Module

- Vaccination Module

Instructions and standardized surveillance methods and definitions for each module of the Patient Safety Component are provided in this manual and on the NHSN website (www.cdc.gov/nhsn). 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 in which a facility chooses to participate, 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 (HPS) component of NHSN: the Blood/Body Fluid Exposure Modules With and Without Exposure Management and the Influenza Vaccination and Exposure Management Modules. The Blood/Body Fluids Exposure and the Influenza Vaccination and Exposure Modules may be used separately or simultaneously. Instructions and standardized surveillance methods and definitions for each module are provided in the NHSN Manual: HPS Component Protocol http://www.cdc.gov/nhsn/TOC_HPS_Manual.html

The Biovigilance Component of NHSN was developed in collaboration with the transfusion and transplant communities. Biovigilance includes the collection of adverse event data to improve outcomes in the use of blood products, organs, tissues, and cellular therapies.

The Hemovigilance Module is the first part of the Biovigilance Component to be developed in NHSN. This module is designed for staff in healthcare facility transfusion services to track adverse events, including recipient adverse reactions and quality control incidents, related to blood transfusion. Instructions and standardized surveillance method and definitions for this module are provided in the NHSN Manual: https://www.cdc.gov/nhsn/TOC-BIOManual.html.

**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 & CDI 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 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 (see Surveillance Techniques above). 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/PDFs/ImportingProcedureData_current.pdf](http://www.cdc.gov/nhsn/PDFs/ImportingProcedureData_current.pdf)).

See the SSI and PPP protocols for detailed surveillance instructions.

**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), and/or Ventilator-associated Pneumonia (VAP) is possible using the NHSN. See Dialysis Manual for detailed
instructions for Dialysis Event (DE) surveillance. 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, validated for a minimum of 3 months.

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

**Medication-Associated Module**

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 areas. Electronic capture of microbiology and pharmacy data is the available option for this module.

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

**Multidrug-resistant Organism & *Clostridium difficile* Infection (MDRO/CDI) Module**

The NHSN MDRO/CDI 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 CDI 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/CDI protocol for detailed surveillance instructions in this manual.
Vaccination 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 not only to these at-risk individuals, but also to any patient.

The NHSN Vaccination module offers a means for facilities to track the success of capitalizing on influenza vaccination opportunities. Two options are available related to patient susceptibility and adherence to vaccination recommendations.

See the Vaccination protocol for detailed surveillance instructions.
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 metrics 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 Chapter 17.
### Key Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>80% Rule</strong></td>
<td>See CDC Location.</td>
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<tr>
<td><strong>ASA Class</strong></td>
<td>Assessment by the anesthesiologist of the patient’s preoperative physical condition using the American Society of Anesthesiologists’ (ASA) Classification of Physical Status. Patient is assigned one of the following which may be used as one element of SSI risk adjustment: 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. NOTE: If coded as expired or as organ donor, report as ASA = 5.</td>
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<tr>
<td><strong>Aseptically obtained</strong></td>
<td>Obtained in a manner to prevent introduction of organisms from the surrounding tissues into the specimen being collected.</td>
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<tr>
<td><strong>Birthweight</strong></td>
<td>Birthweight is the weight of the infant at the time of birth and should not be changed as the infant gains weight. The birthweight categories are as follows: A = (\leq 750 ) g; B = 751-1000 g; C = 1001-1500 g; D = 1501-2500 g; E = &gt;2500 g.</td>
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<tr>
<td><strong>Catheter-associated Urinary Tract Infection (CAUTI)</strong></td>
<td>CAUTI is a healthcare-associated 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, Device-associated infection, and Healthcare-associated infection.</td>
</tr>
<tr>
<td><strong>CDC Location</strong></td>
<td>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 <strong>80% Rule</strong>. 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).</td>
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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-associated 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, common iliac veins, and femoral veins (not femoral arteries).

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.
NOTE: An introducer is considered an intravascular catheter, and depending on the location of its tip, may be a central line.
NOTE: Intraaortic balloon pumps (IABP) are not considered central lines because they are not generally used for infusion or withdrawal of blood, but are used instead for therapeutic purposes. Neither lines used for extracorporeal membrane oxygenation (ECMO).

Central Line-associated Bloodstream Infection (CLABSI)

A CLABSI is a healthcare-associated 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, Device-associated infection and Healthcare-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 secondary (DIS) SSI
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).

### Device-associated infection
A healthcare-associated 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. See also Healthcare-associated infection.

### 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). 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. At the end of the month sum the daily counts and enter into NHSN the total for each type of device.

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, validated for a minimum of 3 months.

### Died
The patient died during this facility admission.

### 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/CDI protocol - LabID Event option)**

Any MDRO isolate from the same patient after an initial isolation of the specific MDRO during a calendar month, regardless of specimen source.

**Emergency Operative Procedure**

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

**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.

**General anesthesia**

General anesthesia is defined as the administration of drugs or gases that enter the general circulation and affect the central nervous system to render the patient pain free, amnesic, unconscious, and often paralyzed with relaxed muscles.

**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, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection. See also Chapter 17.

**Implant**

*Implant:* A nonhuman-derived object, material, or tissue that is placed in a patient during an operative procedure. Examples include: porcine or synthetic heart valves, mechanical heart, metal rods, mesh, sternal wires, screws, cements, internal staples, hemoclips, and other devices. Non-absorbable sutures are excluded because Infection Preventionists may not easily identify and/or differentiate the soluble nature of suture material used.

For surveillance purposes, this object is considered an implant until it or the
area/structures contiguous with the implant are manipulated for diagnostic or therapeutic purposes. If infection develops after such manipulation, do not attribute it to the operation in which the implant was inserted; instead attribute it to the latter procedure. If the latter procedure is an NHSN operative procedure, subsequent infection can be considered SSI if it meets criteria. If the latter procedure is not an NHSN operative procedure, subsequent infection cannot be considered an SSI but may meet criteria for another HAI and be reported as such.

### 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 e.g., not used for irrigation; 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
See NHSN inpatient.

### 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 according to the 80% Rule. 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.

### 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 (except for Dialysis Event surveillance). Operating rooms (including cardiac cath labs, c-section rooms, and interventional radiology) and outpatient locations are not valid locations for these types of surveillance. See also CDC Location.

<table>
<thead>
<tr>
<th>Location of attribution</th>
<th>The location to which the event is being attributed. See also Date of event and Transfer rule.</th>
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<tbody>
<tr>
<td>Medical school affiliation</td>
<td>Major teaching – Hospital that is an important part of the teaching program of a medical school and the majority of medical students rotate through multiple clinical services. Graduate – Hospital is used by the medical school for graduate training programs only (i.e., residency and/or fellowships). Limited – Hospital is used in the medical school’s teaching program to only a limited extent. Nonteaching – Hospital is not affiliated with a medical school.</td>
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| Neonatal intensive care unit (NICU) | 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. There are two types of NICU in NHSN: combined Level II/III NICU and Level III NICU. NOTE: In NHSN, a Level II nursery is considered a Step Down Neonatal Nursery ward (not an NICU). NOTE: The categories of Level II, listed below, are classifications from the American Academy of Pediatrics, Definitions of hospital-based newborn services. Level II neonatal care (specialty) Special care nursery: level II units are subdivided into 2 categories on the basis of their ability to provide assisted ventilation including continuous positive airway pressure. Level II A: has the capabilities to • Resuscitate and stabilize preterm and/or ill infants before transfer to a facility at which newborn intensive care is provided • Provide care for infants born at ≥ 32 weeks’ gestation and weighing ≥ 1500 g (1) who have physiologic immaturity such as apnea of prematurity, inability to maintain body temperature, or inability to take |
oral feedings or (2) who are moderately ill with problems that are anticipated to resolve rapidly and are not anticipated to need subspecialty services on an urgent basis

- Provide care for infants who are convalescing after intensive care

*Level IIIB* has the capabilities of a level IIA nursery and the additional capability to provide mechanical ventilation for brief durations (< 24 hours) or continuous positive airway pressure

A NICU can be a combined nursery housing both Level II and III newborns and infants or a nursery housing only Level III newborns and infants.

NOTE: The categories of Level III, listed below, are classifications from the American Academy of Pediatrics, Definitions of hospital-based newborn services\(^2\). These classifications are all considered Level III NICUs in NHSN.

- **Level III (subspecialty) NICU:** level III NICUs are subdivided into 3 categories

  - **Level IIIA:** has the capabilities to
    - Provide comprehensive care for infants born at >28 weeks’ gestation and weighing >1000 g
    - Provide sustained life support limited to conventional mechanical ventilation
    - Perform minor surgical procedures such as placement of central venous catheter or inguinal hernia repair

  - **Level IIIB NICU:** has the capabilities to provide
    - Comprehensive care for extremely low birth weight infants (\(\leq 1000 \text{ g and } \leq 28 \text{ weeks’ gestation})
    - Advanced respiratory support such as high-frequency ventilation and inhaled nitric oxide for as long as required
    - Prompt and on-site access to a full range of pediatric medical subspecialists
    - Advanced imaging, with interpretation on an urgent basis, including computed tomography, magnetic resonance imaging, and echocardiography
    - Pediatric surgical specialists and pediatric anesthesiologists
on site or at a closely related institution to perform major surgery such as ligation of patent ductus arteriosus and repair of abdominal wall defects, necrotizing enterocolitis with bowel perforation, tracheoesophageal fistula and/or esophageal atresia, and myelomeningocele

*Level IIIC NICU:* has the capabilities of a level IIIB NICU and also is located within an institution that has the capability to provide ECMO and surgical repair of complex congenital cardiac malformations that require cardiopulmonary bypass

### Neonate

A patient who is ≤ 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. NOTE: A patient who is admitted to an inpatient location as an “observation” patient is identified as an inpatient on the first and subsequent days for the purposes of counting a location’s total patient days and device days.

### NHSN operative procedure

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, which is defined as a single trip to an 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, Chapter 9.  
NOTE: If the skin incision edges do not meet because of wires or devices or other objects extruding through the incision, the incision is not considered primarily closed and therefore the procedure is not considered an operation. Further, any subsequent infection is not considered a procedure-associated infection (i.e., not an SSI or PPP). See also Operating room.

### NHSN outpatient

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

### Operating room (OR)

A patient care area that met the American Institute Architects (AIA) or Facilities Guideline Institute (FGI) criteria for an operating room when it was constructed or renovated. This may include an operating room, C-Section...
An 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. NOTE: If the skin incision edges do not meet because of wires or devices or other objects extruding through the incision, the incision is not considered primarily closed and therefore the procedure is not considered an operation. Further, any subsequent infection is not considered a procedure-associated infection (i.e., not an SSI or PPP). See also NHSN operative procedure and Operating room.

A pneumonia that meets one of the criteria for pneumonia (PNEU) and occurs after an inpatient operation takes place, but prior to discharge.

A culture-confirmed BSI associated with a documented HAI at another site (i.e., meets CDC criteria of infection at another site such as UTI). If the primary infection is cultured, the Secondary BSI must yield culture of a same organism as the primary HAI site, regardless of antibiogram. For example, if blood culture is positive in a patient with a healthcare-associated SUTI and at least one organism of both blood and urine specimens is the same, infection is reported as SUTI with secondary BSI, regardless of the antibiograms of the organism. Secondary BSI is not reported separately. Report the shared organism(s) to the genus/species level only once, and if antibiogram data are available, report the results from the most resistant panel. Also, report any additional organisms found in either of the cultures. If, on the other hand, for example, an organ/pace SSI is identified by CT scan and no surgical site culture is used to meet the criteria for SSI-IAB, and a blood culture grows
**Bacteroides fragilis**, then the SSI-IAB is recorded as an SSI with a secondary BSI. The pathogen for the SSI is recorded as *Bacteroides fragilis*. See IAB criteria in Chapter 17 of the NHSN Manual, CDC/NHSN Surveillance Definition of Healthcare-Associated Infection and Criteria for Specific Types of Infections in the Acute Care Setting. See also the Secondary BSI Guide containing the Positive Blood Culture flowchart which is posted under NHSN Guides within the NHSN Resource Library for this most up-to-date information.

<table>
<thead>
<tr>
<th>Specialty care area (SCA)</th>
<th>Hospital location in which specialized care of the following types is provided:</th>
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<tbody>
<tr>
<td></td>
<td>• Bone marrow transplant</td>
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<td></td>
<td>• Solid organ transplant</td>
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<td></td>
<td>• Inpatient acute dialysis</td>
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<td></td>
<td>• Hematology/Oncology</td>
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<td>See also Chapter 15 for descriptions.</td>
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**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;
- an operation classified as contaminated or dirty/infected, 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.

*NOTE: As of 2010, NHSN began using standardized infection ratios (SIR) based on operative procedure category-specific multivariate risk models rather than risk index-stratified SSI rates. For duration cut point values and risk index-stratified SSI rates, see NHSN Report: Data summary for 2006 through 2008, issued December 2009 found at http://www.cdc.gov/nhsn/dataStat.html. See also ASA score and Wound class.*

**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). See also Chapter 9 for criteria.

**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). See also Chapter 9 for criteria.
**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 (AST).

**Temporary central line**

A central line that is not tunneled or implanted.

**Transfer rule**

If an HAI develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location. Likewise, if an HAI develops within 48 hours transfer from one inpatient facility to another, the infection is attributed to the transferring facility. Facilities should share information about such HAIs with the transferring facility to enable reporting.

**Trauma**

Blunt or penetrating injury.

**Umbilical catheter**

A central line inserted through the umbilical artery or vein in a neonate.

**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 a healthcare-associated 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, Device-associated infection and Healthcare-associated infection.

**Wound Class**

An assessment of the degree of contamination of a surgical wound at the time of the operation. Wound class should be assigned by a person involved in the surgical procedure, e.g., surgeon, circulating nurse, etc. The wound class system used in NHSN is an adaptation of the American College of Surgeons wound classification schema. 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.

---


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

This chapter contains the CDC/NHSN surveillance definition of healthcare-associated infection (HAI) and criteria for all specific types of HAI. These criteria include those for the “Big Four” infection types (surgical site infection [SSI], pneumonia [PNEU], bloodstream infection [BSI] and urinary tract infection [UTI]), outlined in earlier chapters of this manual, as well as criteria for other types of HAI. Of particular importance, this chapter provides further required criteria for the specific event types that constitute organ/space SSIs (e.g., mediastinitis [MED] that may follow a coronary artery bypass graft, intra-abdominal abscess [IAB] after colon surgery). Additionally, it is necessary to refer to the criteria in this chapter when determining whether a positive blood culture represents a primary BSI or is secondary to a different type of HAI. A BSI that is identified as secondary to another site of infection must meet one of the criteria of HAI detailed in this chapter. Secondary BSIs are not reported as separate events in NHSN, nor can nor should they be associated with a central line.

NOTE: Some CDC/NHSN definitions and criteria have been updated since the article contained in this chapter was published. In such cases, the updates to any criteria which are no longer valid have been listed and the changes summarized in the table below. For the “big 4” infections, i.e., CLABSI, CAUTI, VAP and SSI, it may be simpler to refer to the specific protocol chapter in the PSC manual, e.g., Chapter 4 for CLABSI surveillance.

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<tr>
<th>Section</th>
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</thead>
<tbody>
<tr>
<td>Added 1/1/2012:</td>
<td>In those situations where a patient meets criteria for more than one specific site of infection within a major infection site category (e.g., meets criteria for both SKIN and ST within the SST category), report only the more “serious” specific site of infection (e.g., ST).</td>
<td>310</td>
</tr>
<tr>
<td>• SUTI- Symptomatic urinary tract infection</td>
<td>1) SUTI- criteria dependent on current, recent or no presence of indwelling urinary catheter and age of patient.</td>
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<tr>
<td>• ASB- Asymptomatic bacteriuria</td>
<td>2) ASB- removed as specific infection type.</td>
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<td></td>
<td>3) Specific infection type - Asymptomatic bacteremic urinary tract infection (ABUTI) created.</td>
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<tr>
<td></td>
<td>1/1/2012:</td>
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<tr>
<td></td>
<td>1. SUTI and ABUTI: Further</td>
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</table>
explanation added under the Comments section:
• Laboratory cultures reported as “mixed flora” represent at least 2 species of organisms. Therefore an additional organism recovered from the same culture, would represent > 2 species of microorganisms. Such a specimen could not be used to meet the UTI criteria.

2. SUTI criteria 2a, 2b and 4:
   Removal of phrase “a positive urinalysis demonstrated by” in order to recognize that Gram stains may not be performed as part of urinalysis.

3. Addition to all SUTI criteria so that they read “…at time of specimen collection or onset of signs or symptoms…” to identify that the presence of catheter is related to both of these signs of infection.

| Table 1. CDC/NHSN major and specific types of healthcare-associated infections |
|-------------------------------------------------------------------------------------------------|----------------|
| ABUTI- Asymptomatic bacteremic urinary tract infection added as specific infection type.          | 311 |
| ASB- Asymptomatic bacteriuria removed as specific infection type.                                |     |

| OUTI- Other infections of the urinary tract (kidney, ureter, bladder, urethra, or tissue surrounding the retroperitoneal or perinephric space): |
|---------------------------------------------------------------------------------------------|----------------|
| • 3 d & e                                                                                  | 312 |
| • 4 d & e                                                                                  |     |
| • Reporting instruction                                                                    |     |
**BSI-Bloodstream Infection: LCBI-**
Laboratory-confirmed bloodstream infection

- Criterion #2
- Criterion #3

<table>
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<tr>
<th>Section</th>
<th>Update</th>
<th>Document/Article Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion 2 and 3:</td>
<td>Change terminology “common skin contaminant” to “common commensal”; exclude <em>Corynebacterium diphtheriae</em> from <em>Corynebacterium</em> spp.</td>
<td>314</td>
</tr>
</tbody>
</table>

**Removed:**

- “4. There are several issues to consider when determining sameness of organisms”
- Table 2. (Examples of how to interpret the sameness of two skin contaminant isolates by comparing antimicrobial susceptibilities)
- 4 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.
- 4 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).
- 4 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.

**Added:**

Only genus and species identification should be utilized to determine the sameness of organisms. No additional comparative methods should be used (e.g., morphology or antibiograms) because laboratory testing capabilities and protocols may vary between...
facilities. This will reduce reporting variability, solely due to laboratory practice, between facilities reporting LCBIs meeting criterion 2. Report the organism to the genus/species level only once, and if antibiogram data are available, report the results from the most resistant panel.

Criterion 3 (for patient ≤ 1 year of age): Fever (>38°C, core) replaces fever (>38°C, rectal). Hypothermia (<36°C, core) replaces hypothermia (<37°C, rectal).

REPORTING INSTRUCTIONS:

- Report organisms cultured from blood as BSI – LCBI when no other site of infection is evident.
- When there is a positive blood culture and clinical signs or symptoms of localized infection at a vascular access site, but no other infection can be found, the infection is considered a primary BSI.
- 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, neither a BSI nor an SST-SKIN or ST infection.

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, include the patient’s central line days in the summary denominator count.
<table>
<thead>
<tr>
<th>Section</th>
<th>Update</th>
<th>Document/Article Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSEP- Clinical Sepsis-</td>
<td>Removed CSEP as a CDC/NHSN infection type as of 1/1/2010.</td>
<td>316</td>
</tr>
<tr>
<td>SST-Skin and Soft Tissue Infection:</td>
<td>Added Instruction: Even if there are clinical signs or symptoms of localized infection at a vascular access site, but no other infection can be found, the infection is considered a primary BSI.</td>
<td>324-325</td>
</tr>
<tr>
<td>• Reporting instructions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI-Gastrointestinal System Infection:</td>
<td>As of 1/1/2012: The following definition replaces the printed NEC definition. This definition is for use only in infants (≤ 1 year of age).</td>
<td>321</td>
</tr>
<tr>
<td>• NEC- Necrotizing Enterocolitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Infant has at least 1 of the clinical and 1 of the radiographic findings from the lists below:</td>
<td></td>
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<tr>
<td>At least 1 clinical sign:</td>
<td></td>
<td></td>
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<tr>
<td>a. Bilious aspirate*</td>
<td></td>
<td></td>
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<tr>
<td>b. Vomiting</td>
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<td>c. Abdominal distension</td>
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<td>d. Occult or gross blood in stools (with no rectal fissure)</td>
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<td>AND</td>
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<td>At least 1 radiographic finding:</td>
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<tr>
<td>e. Pneumatosis intestinalis</td>
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<tr>
<td>f. Portal venous gas (Hepatobiliary gas)</td>
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<tr>
<td>g. Pneumoperitoneum</td>
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<tr>
<td>*Bilious aspirate as a result of a transpyloric placement of a nasogastric tube should be excluded</td>
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<tr>
<td>2) Surgical NEC: Infant has at least 1 of the following surgical findings:</td>
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<tr>
<td>a. Surgical evidence of extensive bowel necrosis (&gt;2 cm of bowel affected)</td>
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</tbody>
</table>
b. Surgical evidence of pneumatosis intestinalis with or without intestinal perforation

---Please review the identified sections for more details.---
**Patient Safety Monthly Reporting Plan**

*required for saving

<table>
<thead>
<tr>
<th>Facility ID:</th>
<th>*Month/Year: _________ /______</th>
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</thead>
</table>

☐ No NHSN Patient Safety Modules Followed this Month

### Device-Associated Module

<table>
<thead>
<tr>
<th>Locations</th>
<th>CLABSI</th>
<th>DE</th>
<th>VAP</th>
<th>CAUTI</th>
<th>CLIP</th>
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### Procedure-Associated Module

<table>
<thead>
<tr>
<th>Procedures</th>
<th>SSI</th>
<th>Post-procedure PNEU</th>
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<tr>
<td></td>
<td>(Circle one setting)</td>
<td>(Circle)</td>
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<td>In</td>
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### Medication-Associated Module: Antimicrobial Use and Resistance

<table>
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<th>Antimicrobial Use</th>
<th>Antimicrobial Resistance</th>
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**Assurance of Confidentiality:** The voluntarily provided information obtained in this surveillance system that would permit identification of any individual or institution is collected with a guarantee that it will be held in strict confidence, will be used only for the purposes stated, and will not otherwise be disclosed or released without the consent of the individual, or the institution in accordance with Sections 304, 306 and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d)).

Public reporting burden of this collection of information is estimated to average 35 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC, Project Clearance Officer, 1600 Clifton Rd., MS D-74, Atlanta, GA 30333, ATTN: PRA (0920-0666).

CDC 57.106(Front) Rev. 2. v6.6
## MDRO and CDI Module

<table>
<thead>
<tr>
<th>Locations</th>
<th>Specific Organism Type</th>
<th>$\text{LabID Event}$ LabID Event</th>
<th>$\text{LabID Event}$ Blood specimens only</th>
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<td>FacWideIN FacWideOUT</td>
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<td>FacWideIN FacWideOUT</td>
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### Process and Outcome Measures

<table>
<thead>
<tr>
<th>Locations</th>
<th>Specific Organism Type</th>
<th>Infection Surveillance</th>
<th>$\text{AST Timing}$</th>
<th>$\text{AST Eligible}$</th>
<th>Incidence</th>
<th>Prevalence</th>
<th>LabID Event</th>
<th>HH</th>
<th>GG</th>
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### Vaccination Module

Check one:
- Summary Method ☐
- Patient-level Method ☐

+ FacWideIN = Facility-wide Inpatient
+ FacWideOUT = Facility-wide Outpatient

$\text{LabID Event}$ = Laboratory-identified Event

$\text{AST Timing}$, circle one choice to indicate time of testing and one choice to indicate type of patients eligible for testing.

$\text{AST Eligible}$: Adm = Admission, Both = Both Admission and Discharge/Transfer

Patients Eligible: All patients tested

NHx = Only patients tested are those who have no documentation at the admitting facility in the previous 12 months of MDRO-colonization or infection at the time of admission.
CDC/NHSN surveillance definition of health care–associated infection and criteria for specific types of infections in the acute care setting

Teresa C. Horan, MPH, Mary Andrus, RN, BA, CIC, and Margaret A. Dudeck, MPH
Atlanta, Georgia

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.

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. HAI’s 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...

From the National Healthcare Safety Network, Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, GA.

Address correspondence to Teresa C. Horan, MPH, Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Mailstop A24, 1600 Clifton Road, NE, Atlanta, GA 30333. E-mail: thoran@cdc.gov.

0196-6553/$34.00
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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 (e.g., herpes simplex, toxoplasmosis, rubella, cytomegalovirus, or syphilis) and become evident ≤48 hours after birth; and
  - 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 excreta 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 (e.g., HICPAC [http://www.cdc.gov/ncidod/dhqp/hicapc_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, ≥10⁵ 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]/mm³ 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 ≥10⁵ colonies/mL in non-voided specimens
     e. ≤10⁵ 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

<table>
<thead>
<tr>
<th>UNTI</th>
<th>Urinary tract infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUTI</td>
<td>Symptomatic urinary tract infection</td>
</tr>
<tr>
<td>ASB</td>
<td>Asymptomatic bacteriuria</td>
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<tr>
<td>OUTI</td>
<td>Other infections of the urinary tract</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SSI</th>
<th>Surgical site infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP</td>
<td>Superficial incisional primary SSI</td>
</tr>
<tr>
<td>SIS</td>
<td>Superficial incisional secondary SSI</td>
</tr>
<tr>
<td>DIP</td>
<td>Deep incisional primary SSI</td>
</tr>
<tr>
<td>DIS</td>
<td>Deep incisional secondary SSI</td>
</tr>
<tr>
<td>Organ/Space</td>
<td>Organ/space SSI. Indicate specific type:</td>
</tr>
<tr>
<td></td>
<td>• BONE, • LUNG</td>
</tr>
<tr>
<td></td>
<td>• BRST, • MED</td>
</tr>
<tr>
<td></td>
<td>• CARD, • MEN</td>
</tr>
<tr>
<td></td>
<td>• DISC, • ORAL</td>
</tr>
<tr>
<td></td>
<td>• EAR, • OREP</td>
</tr>
<tr>
<td></td>
<td>• EMET, • OUTI</td>
</tr>
<tr>
<td></td>
<td>• ENDO, • SA</td>
</tr>
<tr>
<td></td>
<td>• EYE, • SINU</td>
</tr>
<tr>
<td></td>
<td>• GIT, • UR</td>
</tr>
<tr>
<td></td>
<td>• IAB, • VASC</td>
</tr>
<tr>
<td></td>
<td>• IC, • VCUF</td>
</tr>
<tr>
<td></td>
<td>• JNT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BSI</th>
<th>Bloodstream infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCB</td>
<td>Laboratory-confirmed bloodstream infection</td>
</tr>
<tr>
<td>CSEP</td>
<td>Clinical sepsis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PNEU</th>
<th>Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNU1</td>
<td>Pneumonia with specific laboratory findings</td>
</tr>
<tr>
<td>PNU2</td>
<td>Pneumonia with specific laboratory findings</td>
</tr>
<tr>
<td>PNU3</td>
<td>Pneumonia in immunocompromised patient</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BJ</th>
<th>Bone and joint infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONE</td>
<td>Osteomyelitis</td>
</tr>
<tr>
<td>JNT</td>
<td>Joint or bursa</td>
</tr>
<tr>
<td>DISC</td>
<td>Disc space</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CNS</th>
<th>Central nervous system</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>Intracranial infection</td>
</tr>
<tr>
<td>MEN</td>
<td>Meningitis or ventriculitis</td>
</tr>
<tr>
<td>SA</td>
<td>Spinal abscess without meningitis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CVS</th>
<th>Cardiovascular system infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>VASC</td>
<td>Arterial or venous infection</td>
</tr>
<tr>
<td>ENDO</td>
<td>Endocarditis</td>
</tr>
<tr>
<td>CARD</td>
<td>Myocarditis or pericarditis</td>
</tr>
<tr>
<td>MED</td>
<td>Mediastinitis</td>
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Table 1. Continued

<table>
<thead>
<tr>
<th>REPR</th>
<th>Reproductive tract infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMET</td>
<td>Endometritis</td>
</tr>
<tr>
<td>EPIS</td>
<td>Epiisiotomy</td>
</tr>
<tr>
<td>VCUF</td>
<td>Vaginal cuff</td>
</tr>
<tr>
<td>OREP</td>
<td>Other infections of the male or female reproductive tract</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SST</th>
<th>Skin and soft tissue infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKIN</td>
<td>Skin</td>
</tr>
<tr>
<td>ST</td>
<td>Soft tissue</td>
</tr>
<tr>
<td>DECU</td>
<td>Decubitus ulcer</td>
</tr>
<tr>
<td>BURN</td>
<td>Burn</td>
</tr>
<tr>
<td>BRST</td>
<td>Breast abscess or mastitis</td>
</tr>
<tr>
<td>UMB</td>
<td>Omphalitis</td>
</tr>
<tr>
<td>PUST</td>
<td>Pustulosis</td>
</tr>
<tr>
<td>CIRC</td>
<td>Newborn circumcision</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYS</th>
<th>Systemic Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI</td>
<td>Disseminated infection</td>
</tr>
</tbody>
</table>

(<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 \( \leq 1 \) year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (\( >38^\circ C \)), hypothermia (\( <37^\circ C \)), 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 $\geq 10^5$ 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 ($>38^\circ C$), 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 ($>38^\circ C$), 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 ($>38^\circ C$), 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 ($>38^\circ C$ rectal), hypothermia ($<37^\circ C$ 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)
  - CARD
  - DISC
  - EAR
  - EMET
  - ENDO
  - EYE
  - GIT
  - IAB
  - IC
  - JNT
  - 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, 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**

<table>
<thead>
<tr>
<th>Culture</th>
<th>Companion Culture</th>
<th>Report as…</th>
</tr>
</thead>
<tbody>
<tr>
<td>S epidermidis</td>
<td>Coagulase-negative staphylococci</td>
<td>S epidermidis</td>
</tr>
<tr>
<td>Bacillus spp (not anthracis)</td>
<td>B cereus</td>
<td>B cereus</td>
</tr>
<tr>
<td>S salivarius</td>
<td>Strep viridans</td>
<td>S salivarius</td>
</tr>
</tbody>
</table>

**Table 3. Examples of “sameness” by organism antibiogram**

<table>
<thead>
<tr>
<th>Organism Name</th>
<th>Isolate A</th>
<th>Isolate B</th>
<th>Interpret as…</th>
</tr>
</thead>
<tbody>
<tr>
<td>S epidermidis</td>
<td>All drugs</td>
<td>All drugs</td>
<td>Same</td>
</tr>
<tr>
<td>S epidermidis</td>
<td>OX R</td>
<td>OX S</td>
<td>Different</td>
</tr>
<tr>
<td>S epidermidis</td>
<td>CEAZ R</td>
<td>CEAZ S</td>
<td>Different</td>
</tr>
<tr>
<td>Corynebacterium spp</td>
<td>PENG R</td>
<td>PENG S</td>
<td>Different</td>
</tr>
<tr>
<td>CIPRO S</td>
<td>CIPRO R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strep viridans</td>
<td>All drugs</td>
<td>All drugs</td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>except ERYTH R</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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). 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 semi-quantitative culture of a catheter tip, but with either negative or no blood culture is considered a CV-S-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

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 (AgNO₃) 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, respiratory distress, apnea, or bradycardia 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

**Reporting instructions**

- 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.

**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

- Purulence alone at the burn wound site 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 - Omphalitis

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 institutes appropriate antimicrobial therapy.

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.

References


APPENDIX. 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.
**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)

<table>
<thead>
<tr>
<th>Radiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more serial chest radiographs with at least 1 of the following:</td>
<td>FOR ANY PATIENT, at least 1 of the following:</td>
</tr>
<tr>
<td>• New or progressive and persistent infiltrate</td>
<td>• Fever (&gt;38°C or &gt;100.4°F) with no other recognized cause</td>
</tr>
<tr>
<td>• Consolidation</td>
<td>• Leukopenia (&lt;4000 WBC/mm³) or leukocytosis (≥12,000 WBC/mm³)</td>
</tr>
<tr>
<td>• Cavitation</td>
<td>• For adults ≥70 years old, altered mental status with no other recognized</td>
</tr>
<tr>
<td>• Pneumatoceles, in infants ≤1 year old</td>
<td>cause and</td>
</tr>
<tr>
<td>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</td>
<td>at least 2 of the following:</td>
</tr>
<tr>
<td></td>
<td>• New onset of purulent sputum3 or change in character of sputum4 or increased</td>
</tr>
<tr>
<td></td>
<td>respiratory secretions or increased suctioning requirements</td>
</tr>
<tr>
<td></td>
<td>• New onset or worsening cough, or dyspnea, or tachypnea5</td>
</tr>
<tr>
<td></td>
<td>• Rales6 or bronchial breath sounds</td>
</tr>
<tr>
<td></td>
<td>• Worsening gas exchange (eg, O₂ desaturations [eg, PaO₂/FiO₂ ≤240],7 increased</td>
</tr>
<tr>
<td></td>
<td>oxygen requirements, or increased ventilator demand)</td>
</tr>
</tbody>
</table>

ALTERNATE CRITERIA, for infants ≤1 year old: Worsening gas exchange (eg, O₂ 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/mm³) or leukocytosis (≥15,000 WBC/mm³) and left shift (≥10% band forms)
• New onset of purulent sputum3 or change in character of sputum4 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/mm³) or leukocytosis (≥15,000 WBC/mm³)
• New onset of purulent sputum3 or change in character of sputum4 or increased respiratory secretions or increased suctioning requirements
• New onset or worsening cough or dyspnea, apnea, or tachypnea5
• Rales6 or bronchial breath sounds
• Worsening gas exchange (eg, O₂ 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)

<table>
<thead>
<tr>
<th>Radiology</th>
<th>Signs/Symptoms</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more serial chest radiographs with at least 1 of the following:</td>
<td>At least 1 of the following:</td>
<td>At least 1 of the following:</td>
</tr>
<tr>
<td>- New or progressive and persistent infiltrate</td>
<td>- Fever (&gt;38°C or &gt;100.4°F) with no other recognized cause</td>
<td>- Positive growth in blood culture not related to another source of infection</td>
</tr>
<tr>
<td>- Consolidation</td>
<td>- Leukopenia (&lt;4000 WBC/mm³) or leukocytosis (&gt;12,000 WBC/mm³)</td>
<td>- Positive growth in culture of pleural fluid</td>
</tr>
<tr>
<td>- Cavitation</td>
<td>- For adults ≥70 years old, altered mental status with no other recognized cause and</td>
<td>- Positive quantitative culture from minimally contaminated LRT specimen (eg, BAL or protected specimen brushing)</td>
</tr>
<tr>
<td>- Pneumatoceles, in infants ≤1 year old</td>
<td>at least 1 of the following:</td>
<td>- ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (eg, Gram stain)</td>
</tr>
<tr>
<td>NOTE: In patients without underlying pulmonary or cardiac disease (eg, respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), I definitive chest radiograph is acceptable.</td>
<td>- New onset of purulent sputum or change in character of sputum or increased respiratory secretions or increased sputum production</td>
<td>- Histopathologic exam shows at least 1 of the following evidences of pneumonia:</td>
</tr>
<tr>
<td></td>
<td>- New onset or worsening cough or dyspnea or tachypnea</td>
<td>- Abscess formation or foci of consolidation with intense PMN accumulation in bronchioles and alveoli</td>
</tr>
<tr>
<td></td>
<td>- Rales or bronchial breath sounds</td>
<td>- Positive quantitative culture of lung parenchyma</td>
</tr>
<tr>
<td></td>
<td>- Worsening gas exchange (eg, O₂ desaturations [eg, PaO₂/FiO₂ ≤240])</td>
<td>- Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Radiology</th>
<th>Signs/Symptoms</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more serial chest radiographs with at least 1 of the following:</td>
<td>At least 1 of the following:</td>
<td>At least 1 of the following:</td>
</tr>
<tr>
<td>- New or progressive and persistent infiltrate</td>
<td>- Fever (&gt;38°C or &gt;100.4°F) with no other recognized cause</td>
<td>- Positive culture of virus or Chlamydia from respiratory secretions</td>
</tr>
<tr>
<td>- Consolidation</td>
<td>- Leukopenia (&lt;4000 WBC/mm³) or leukocytosis (&gt;12,000 WBC/mm³)</td>
<td>- Positive detection of viral antigen or antibody from respiratory secretions (eg, EIA, FAMA, shell vial assay, PCR)</td>
</tr>
<tr>
<td>- Cavitation</td>
<td>- For adults ≥70 years old, altered mental status with no other recognized cause and</td>
<td>- Four-fold rise in paired sera (IgG) for pathogen (eg, influenza viruses, Chlamydia)</td>
</tr>
<tr>
<td>- Pneumatoceles, in infants ≤1 year old</td>
<td>at least 1 of the following:</td>
<td>- Positive PCR for Chlamydia or Mycoplasma</td>
</tr>
<tr>
<td>NOTE: In patients without underlying pulmonary or cardiac disease (eg, respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), I definitive chest radiograph is acceptable.</td>
<td>- New onset of purulent sputum or change in character of sputum or increased respiratory secretions or increased sputum production</td>
<td>- Positive micro-IF test for Chlamydia</td>
</tr>
<tr>
<td></td>
<td>- New onset or worsening cough or dyspnea or tachypnea</td>
<td>- Positive culture or visualization by micro-IF of Legionella spp, from respiratory secretions or tissue</td>
</tr>
<tr>
<td></td>
<td>- Rales or bronchial breath sounds</td>
<td>- Detection of Legionella pneumophila serogroup 1 antigens in urine by RIA or EIA</td>
</tr>
<tr>
<td></td>
<td>- Worsening gas exchange (eg, O₂ desaturations [eg, PaO₂/FiO₂ ≤240])</td>
<td>- EIA</td>
</tr>
<tr>
<td></td>
<td>(eg, O₂ desaturations [eg, PaO₂/FiO₂ ≤240])</td>
<td>- Four-fold rise in L pneumophila serogroup 1 antibody titer to ≥1:128 in paired acute and convalescent sera by indirect IFA</td>
</tr>
</tbody>
</table>

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. Tachypnea may be described as “crackles.”

7. This measure of arterial oxygenation is defined as the ratio of the arterial tension (PaO₂) to the inspiratory fraction of oxygen (FiO₂).

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 contaminant, 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)

<table>
<thead>
<tr>
<th>Radiology</th>
<th>Signs/Symptoms</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more serial chest radiographs with at least 1 of the following:(^{11,12}):</td>
<td>Patient who is immunocompromised(^{13}) has at least 1 of the following:</td>
<td>At least 1 of the following:</td>
</tr>
<tr>
<td>- New or progressive and persistent infiltrate</td>
<td>- Fever (&gt;38°C or &gt;100.4°F) with no other recognized cause</td>
<td>- Matching positive blood and sputum cultures with Candida spp(^{14,15})</td>
</tr>
<tr>
<td>- Consolidation</td>
<td>- For adults ≥70 years old, altered mental status with no other recognized cause</td>
<td>- Evidence of fungi or Pneumocystis carinii from minimally contaminated LRT specimen (eg, BAL or protected specimen brushing) from 1 of the following:</td>
</tr>
<tr>
<td>- Cavitation</td>
<td>- New onset of purulent sputum(^3) or change in character of sputum(^5) or increased respiratory secretions or increased suctioning requirements</td>
<td></td>
</tr>
<tr>
<td>- Pneumatoceles, in infants ≤1 year old</td>
<td>- New onset or worsening cough or dyspnea or tachypnea(^7)</td>
<td>- Positive culture of fungi</td>
</tr>
<tr>
<td>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)</td>
<td>- Rales(^6) or bronchial breath sounds</td>
<td>- Any of the laboratory criteria defined under PNU2</td>
</tr>
</tbody>
</table>

\(^{11}\) 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 Mycoplasma 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 (eg, >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

<table>
<thead>
<tr>
<th>Specimen collection/technique</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung parenchyma(^*)</td>
<td>≥10(^4) cfu/g tissue</td>
</tr>
<tr>
<td>Bronchoscopically obtained specimens</td>
<td></td>
</tr>
<tr>
<td>Bronchoalveolar lavage</td>
<td>≥10(^4) cfu/mL</td>
</tr>
<tr>
<td>Protected BAL</td>
<td>≥10(^4) cfu/mL</td>
</tr>
<tr>
<td>Protected specimen brushing</td>
<td>≥10(^4) cfu/mL</td>
</tr>
<tr>
<td>Nonbronchoscopically obtained (blind) specimens</td>
<td></td>
</tr>
<tr>
<td>Bronchoalveolar lavage</td>
<td>≥10(^4) cfu/mL</td>
</tr>
<tr>
<td>Protected BAL</td>
<td>≥10(^4) cfu/mL</td>
</tr>
</tbody>
</table>

cfu, colony-forming units.

\(^*\)Open-lung biopsy specimens and immediate post-mortem specimens obtained by transthoracic or tranbronchial biopsy.
<table>
<thead>
<tr>
<th>Criterion</th>
<th>Urinary Tract Infection (UTI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptomatic Urinary Tract Infection (SUTI)</strong></td>
<td>Must meet at least 1 of the following criteria</td>
</tr>
<tr>
<td>1a</td>
<td>Patient had an indwelling urinary catheter in place at the time of specimen collection or onset of signs or symptoms and at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C), suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urine culture of ≥10⁵ colony-forming units (CFU)/ml with no more than 2 species of microorganisms (see Comments section below).</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td>Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection or onset of signs or symptoms and at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urine culture of ≥10⁵ colony-forming units (CFU)/ml with no more than 2 species of microorganisms (see Comments section below).</td>
</tr>
<tr>
<td>1b</td>
<td>Patient did not have an indwelling urinary catheter in place at the time of collection or onset of signs or symptoms and has at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;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 ≥10⁵ CFU/ml with no more than 2 species of microorganisms (see Comments section below).</td>
</tr>
<tr>
<td>2a</td>
<td>Patient had an indwelling urinary catheter in place at the time of specimen collection or onset of signs or symptoms and at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C), suprapubic tenderness, or costovertebral angle pain or tenderness and 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]/mm³ of unspun urine or ≥3 WBC/high power field of spun urine) c. microorganisms seen on Gram stain of unspun urine and</td>
</tr>
<tr>
<td>Criterion</td>
<td>Urinary Tract Infection (UTI)</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>a positive urine culture of $\geq 10^3$ and $&lt;10^5$ CFU/ml with no more than 2 species of microorganisms (see Comments section below).</td>
</tr>
</tbody>
</table>
|           | OR | Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection or onset of signs or symptoms and at least 1 of the following signs or symptoms with no other recognized cause: fever ($>38^\circ C$), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness and at least 1 of the following findings:  
|           | a. positive dipstick for leukocyte esterase and/or nitrite  
|           | b. pyuria (urine specimen with $\geq 10$ white blood cells [WBC]/mm$^3$ of unspun urine or $\geq 3$ WBC/high power field of spun 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 (see Comments section below). |
| 2b        | Patient did not have an indwelling urinary catheter in place at the time of, or within 48 hours prior to, specimen collection or onset of signs or symptoms and has at least 1 of the following signs or symptoms with no other recognized cause: fever ($>38^\circ C$) in a patient that is $\leq 65$ years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness and at least 1 of the following findings:  
|           | a. positive dipstick for leukocyte esterase and/or nitrite.  
|           | b. pyuria (urine specimen with $\geq 10$ WBC/mm$^3$ of unspun urine or $\geq 3$ WBC/high power field of spun 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 (see Comments section below). |
| 3         | Patient $\leq 1$ 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 ($>38^\circ C$ core), hypothermia ($<36^\circ C$ 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 (see Comments section below). |

*The indwelling urinary catheter was in place within 48 hours prior to specimen collection or onset of signs or symptoms.
<table>
<thead>
<tr>
<th>Criterion</th>
<th>Urinary Tract Infection (UTI)</th>
</tr>
</thead>
</table>
| 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* at least one of the following findings:  
  b. positive dipstick for leukocyte esterase and/or nitritepyuria (urine specimen with ≥10 WBC/mm³ of unspun urine or ≥3 WBC/high power field of spun urine)  
  c. microorganisms seen on Gram’s stain of unspun urine *and* a positive urine culture of between ≥10³ and <10⁵ CFU/ml with no more than two species of microorganisms(see Comments section below).  
*The indwelling urinary catheter was in place within 48 hours prior to specimen collection or onset of signs or symptoms. |

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)</th>
</tr>
</thead>
</table>
|           | Patient with* or without an indwelling urinary catheter has no signs or symptoms (i.e., for any age patient, no fever (>38°C), 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 >10⁵ CFU/ml with no more than 2 species of uropathogen microorganisms** (see Comments section below). *and* a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture, or at least 2 matching blood cultures drawn on separate occasions if the matching pathogen is a common skin commensal.  
*The indwelling urinary catheter was in place within 48 hours prior to specimen collection.  
**Uropathogen microorganisms are: Gram-negative bacilli, Staphylococcus spp., yeasts, beta-hemolytic Streptococcus spp., Enterococcus spp., G. vaginalis, Aerococcus urinae, and Corynebacterium (urease positive)+.  
+Report Corynebacterium (urease positive) as either Corynebacterium species unspecified (COS) or as C. urealyticum (CORUR) if so speciated. |

<table>
<thead>
<tr>
<th>Comments</th>
<th></th>
</tr>
</thead>
</table>
|          | Laboratory cultures reported as “mixed flora” represent at least 2 species of organisms. Therefore an additional organism recovered from the same culture, would represent > 2 species of microorganisms. Such a specimen cannot be used to meet the UTI criteria.  
|          | Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection.  
<p>|          | 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. |</p>
<table>
<thead>
<tr>
<th>Criterion</th>
<th>Urinary Tract Infection (UTI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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.</td>
<td></td>
</tr>
<tr>
<td>• 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.</td>
<td></td>
</tr>
<tr>
<td>• Urine specimen labels should indicate whether or not the patient is symptomatic.</td>
<td></td>
</tr>
<tr>
<td>• Report secondary bloodstream infection = “Yes” for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI).</td>
<td></td>
</tr>
<tr>
<td>• Report only pathogens in both blood and urine specimens for ABUTI.</td>
<td></td>
</tr>
<tr>
<td>• Report <em>Corynebacterium</em> (urease positive) as either <em>Corynebacterium</em> species unspecified (COS) or as <em>C. urealyticum</em> (CORUR) if so speciated.</td>
<td></td>
</tr>
</tbody>
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