

SPECIAL COMMUNICATION

Draft definitions for surveillance of infections in home health care

APIC Home Care Membership Section

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Definitions for hospital-acquired (nosocomial) infections have been developed and published by the Centers for Disease Control and Prevention.¹ These definitions have been widely accepted as standard definitions for hospital infection control programs. Definitions for infection surveillance in long-term care have also been developed and published.² These definitions have been adopted or adapted for use by many long-term care facilities. These two sets of infection definitions for surveillance served as resources for this document. These home care definitions are intended for **adult** patients.

The criteria for infection in these proposed definitions usually include combinations of clinical findings and results of laboratory and other diagnostic tests. Laboratory testing and radiological procedures are performed less frequently in home health care. Instead, clinical observations by home health care providers are often relied on to assess changes in the patient's status.

One set of definitions for urinary tract infections (with or without devices) is used. Also, asymptomatic bacteriuria was not included as part of these definitions.

Agencies may elect not to survey for infections at all anatomic sites (for instance, upper respiratory tract infection) as the effort may be too labor intensive in exchange for the minimum impact on patient morbidity and mortality. However, broad categories of infection were defined for those agencies who choose to use them.

The idea of using a designated temperature for fever is controversial, especially as many elderly persons have minimal or no temperature increase. Some have suggested to use so many degrees above base-

line, but this may not be applicable to home health due to the inadequate understanding of the establishment of baselines. In addition, not all agencies perform routine temperature checks on all patients in the absence of direct indications. Therefore, a designated temperature of >100.4°F was established in the interest of simplicity.

The working group elected to define lower respiratory infections and pneumonia in the same category, as chest radiographs may not always be available or used as much in the home care setting (especially as the patient would have to be referred to an acute care facility for the x-ray). However, in some instances, there may be good objective criteria available to count as a pneumonia.

Home health agencies must establish definitions of infection for the purpose of surveillance before initiating a surveillance program. Definitions should be consistently used in the collection, analysis, and reporting of infection data. Definitions of infection that are established for surveillance are not intended to be used to make clinical decisions or determine treatments. Definitions developed for the purpose of surveillance may be of limited value in an outbreak investigation as a specific case definition is usually required.

The rationale for infection surveillance can be expressed in terms of process and outcome objectives. Process objectives would include:

- a. compliance with accrediting and regulatory agencies
- b. establishment of baseline rates and even susceptibility patterns of micro-organisms
- c. evaluation of specific control measures
- d. education
- e. identification of possible outbreaks

Primary outcome objectives would include reductions in the morbidity, mortality, cost, and suffering associated with infection.

The purpose of surveillance in home health is to establish a baseline at each agency and to monitor trends within the agency over time to tailor staff and patient/care-giver education toward prevention of infection. Valid

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written definitions will enhance consistency, accuracy, and reproducibility of the surveillance data. However, definitions are only one piece of surveillance.

The reader is referred to recommended practices for surveillance.³ Data collectors should be trained on the written definitions adopted by the agency. Among the limitations for surveillance in home health are a variety of assigned surveillance personnel who may not have infection control training or access to a trained infection control professional or epidemiologist. Data also must be analyzed and interpreted. Numerator data may detect problems within an agency, but infection rates should be calculated to monitor meaningful trends. Denominator usage will vary based on accessibility of information within each agency (for example, patient census, average patient census, patient visits, device days, etc). While currently logical, these denominators may be refined more accurately in the future. Lastly, information gathered from surveillance must be reported to and used by those who will be most able to impact and improve patient care.

TIME FRAMES AND TERMINOLOGY

Nosocomial or health care facility-associated infections generally refer to infections that were neither present nor incubating at the time of admission to a health care facility (inpatient or outpatient). Identified nosocomial infections should be reported to the discharging facility.

Home health-associated infections refer to infections that develop in patients who are receiving home health care and that were neither present nor incubating at the time the patient began receiving home health care (generally, 48–72 hours after admission but may vary based on the incubation time of the infecting pathogen). An infection that develops in a patient who has been receiving home health care and is subsequently admitted to a health care facility may be considered a home health-associated infection if it is determined to have been incubating at the time of discharge from home health care.

A surgical site infection occurring within 30 days from the date of surgery will be considered a nosocomial surgical site infection. Infection related to a surgically implanted device should be counted as a nosocomial surgical site infection for up to 1 year from the date of surgery. Surgical site infections meeting these criteria should be reported to the facility where the surgery was performed (if information is available).

KEY CONCEPTS

Describing an infection as nosocomial or home health-associated does not necessarily indicate that the

infection was *caused* by the health care facility or the home health agency. The association is temporal (related to a time, place, or event) not a causal one. In addition, culpability, preventability, and etiology of the organism involved are not part of the definition of either a nosocomial or home health-associated infection.

Certain characteristics of individuals (intrinsic factors) cause them to be more at risk of developing infection. These host factors include, but are not limited to, age, underlying disease, response to stress, nutritional status, immunosuppression, trauma, wounds, and burns.

Certain elements not directly associated with an individual's health status (extrinsic factors) can also make a person more susceptible to infection. Extrinsic factors include socioeconomic status, therapeutic instrumentation (eg, central IV lines, urinary catheters), therapeutic modalities (eg, radiation, cancer chemotherapy), lifestyle (eg, alcoholism, drug abuse), medications, occupational history, and presence or absence of able and willing care givers.

Various environmental factors also may contribute to the development of infection in a patient receiving home health care. Poor sanitation, inadequate plumbing, contaminated supplies and equipment, exposure to the elements (cold, heat, water), rodent or insect infestation, and exposure to contagion are all factors that may increase the risk of acquiring infection.

An additional influencing factor in the development of infection is referred to as an "agent factor." Agent factors include the number of microorganisms to which an individual is exposed (infectious dose), the ease and mode of transmission, and virulence (ability to cause disease) of the organism.

DEFINING INFECTION

The evaluation of a suspected infection should include consideration of whether the symptoms are new or acutely worse from the established baselines. Non infectious causes also must be considered. The definition of infection will include more than a single sign or symptom. Physician diagnosis should be accompanied by compatible signs and symptoms of infection in most cases. Laboratory reports (microbiology and serology findings) alone are not used to define infection, but may be used adjunctively as supportive evidence to confirm infection.

For the purposes of these definitions, fever is defined as $>38^{\circ}\text{C}$ or $>100.4^{\circ}\text{F}$.

URINARY TRACT INFECTIONS

Only symptomatic urinary tract infection is defined. Symptomatic urinary tract infection, in either catheter-

ized or noncatheterized patients, must meet **one** of the following criteria:

A. At least **three** of the following four signs or symptoms:

1. Fever (>100.4°F) **OR** chills
2. Flank pain **OR** suprapubic pain **OR** tenderness **OR** frequency **OR** urgency
3. Worsening of mental status/functional status
4. Changes in urine character (eg, new bloody urine, foul odor; increased sediment) **AND** urinalysis or culture not done.

B. At least **two** of the four above signs or symptoms **AND** at least **one** of the following:

1. Urinalysis with pyuria (urine specimen with ≥ 10 wbc/mm³ or ≥ 3 wbc/high power field of unspun urine) **AND** positive nitrite and/or positive leukocyte esterase
2. Presence of organisms by culture $\geq 10^5$ cfu/mL of urine **AND** no more than two different uropathogens

NOTE: For urine specimens to be of value in determining whether an infection exists, they must be obtained aseptically using an appropriate technique such as clean catch collection, bladder catheterization, or suprapubic aspiration.

RESPIRATORY INFECTIONS

Common cold or pharyngitis

The infections must meet at least **two** of the following signs or symptoms:

1. runny nose,
2. sneezing,
3. stuffy nose (congestion), sore throat **OR** hoarseness **OR** difficulty in swallowing,
4. dry cough, or
5. swollen or tender glands in the neck. Fever may or may not be present, symptoms must be new, and allergies must be ruled out.

Influenza-like illness

(This diagnosis will only be made during influenza season: November through April.) The patient must have both fever **AND** at least **three** of the following six signs or symptoms:

1. chills,
2. new headache **OR** eye pain,
3. myalgia,
4. malaise **OR** loss of appetite,
5. sore throat, or
6. new **OR** increased dry cough. During flu season, if criteria for influenza-like illness **AND** upper **OR** lower respiratory tract infection are

met at the same time, the infection should be recorded only as an influenza-like illness.

Lower respiratory infections (ie, bronchitis) and/or pneumonia

The patient has not had a chest film or the chest film did not confirm pneumonia **AND three** of the following seven signs or symptoms are present:

1. new **OR** increased cough,
2. new **OR** increased sputum production,
3. new **OR** increased purulence of sputum,
4. fever,
5. pleuritic chest pain,
6. new **OR** increased physical finding on chest examination (ie, rales, rhonchi, bronchial breathing), **OR**
7. change in status (new **OR** increased shortness of breath, increased respiratory rate, worsening mental or functional status). Pneumonia may be diagnosed and counted in this category if **one** of the following criteria is met:

1. Rales or dullness on physical examination of the chest **AND** at least **one** of the following:
 - a. new onset of purulent sputum or change in character of the sputum **OR**
 - b. organism cultured from the blood
2. Patient has a chest radiograph that shows new or progressive infiltrate, consolidation, cavitation, or pleural effusion **AND** at least **one** of the following:
 - a. new onset of purulent sputum or change in character of sputum **OR**
 - b. organisms cultured from blood.

NOTE: Noninfectious causes, such as congestive heart failure, should be ruled out.

PRIMARY BLOODSTREAM INFECTION

Primary bloodstream infection includes laboratory-confirmed bloodstream infection and clinical sepsis. Laboratory-confirmed bloodstream infection must meet **one** of the following criteria:

1. Recognized pathogen isolated from blood culture **AND** pathogen is not related to infection at another site.
2. **One** of the following signs or symptoms: fever, chills, or hypotension, **AND one** of the following:
 - a. common skin contaminant isolated from two blood cultures drawn on separate occasions **AND** organism is not related to infection at another site, **OR**
 - b. common skin contaminant isolated from blood culture from patient with intravascular

access device **AND** physician institutes appropriate antimicrobial therapy.

NOTE: When an organism that is isolated from a blood culture is compatible with a related infection at another site, the bloodstream infection is classified as a secondary bloodstream infection. Infections related to intravascular access devices are classified as primary even if localized signs of infection are present at the access site.

Clinical sepsis must meet **one** of the following clinical signs or symptoms with no other recognized cause: fever (>100.4°F), hypotension (systolic pressure ≤90 mm), **OR** oliguria (<20 cm³/hour), **AND** all of the following:

1. Blood culture not done or no organism detected in blood.
2. No apparent infection at another site.
3. Physician institutes antimicrobial therapy for sepsis.

SKIN INFECTIONS

Cellulitis/soft tissue/wound infection (nonsurgical)/decubitus ulcer

These infections must meet at least **one** of the following two criteria:

1. Presence of purulent drainage in the wound, skin or soft tissue site.
2. At least **two** of the following signs or symptoms with no other recognized cause:
 - a. worsening mental/functional status;
 - b. the presence at the affected site of pain or tenderness;
 - c. localized swelling;
 - d. redness; or
 - e. heat **AND** at least **one** of the following:
 1. Organism cultured from aspirate or drainage from affected site; if organisms are normal skin flora (eg, coagulase negative staphylococci, micrococci, diphtheroids) they must be a pure culture; **OR**
 2. Organisms cultured from blood.

Surgical site infections (SSI)

A *superficial* SSI must meet the following criteria: infection occurs within 30 days after the operative procedure **AND** involves only skin and subcutaneous tissue of the incision **AND** the patient has at least **one** of the following:

1. purulent drainage from the superficial incision;
2. organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision;
3. at least **one** of the following signs or symptoms of infection:
 - a. pain or tenderness,

- b. localized swelling,
- c. redness, or
- d. heat **AND** superficial incision is deliberately opened by surgeon and incision is culture positive or not cultured (a culture negative finding does not meet this criterion); or (4) diagnosis of superficial incisional SSI by the surgeon or attending physician.

Deep incisional SSI must meet the following criteria: Infection occurs within 30 days after the operative procedure if no implant 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** the patient has at least **one** of the following:

1. purulent drainage from the deep incision but not from the organ/space component of the surgical site;
2. a deep incision spontaneously dehisces or is deliberately opened by a surgeon and is culture positive or not cultured (a culture negative finding does not meet this criterion) when a patient has **one** or more of the following signs or symptoms: fever or localized pain or tenderness;
3. an abscess or other evidence of infection involving the deep incision is found on direct examination, during re-operation, or by histopathologic or radiologic examination; or
4. diagnosis of a deep incisional SSI by a surgeon or attending physician.

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

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

NOTE: Surgical site infections should be considered nosocomial and reported to the facility where the surgery was performed.

IV site infections

The presence of purulent drainage at the entry site for a peripheral or centrally placed intravascular line **AND** blood culture not done **OR** no organisms are detected in the blood culture.

Fungal skin infection

Both maculopapular rash **AND** either physician diagnosis **OR** laboratory confirmation must be present.

Herpes simplex or zoster infection

Both a vesicular rash **AND** either physician diagnosis **OR** laboratory confirmation must be present.

OSTEOMYELITIS (BONE INFECTION)

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

1. organism cultured from bone,
2. patient has evidence of osteo on direct examination of the bone during surgery or histopathologic examination, or
3. **two** of the following with no other recognized cause: fever; localized swelling, tenderness, heat, or drainage at suspected site of infection **AND one** of the following:
 1. organism isolated from blood culture **OR**
 2. radiographic evidence of infection (x-rays, scans, etc).

EYE, EAR, NOSE, AND MOUTH INFECTIONS

Conjunctivitis

One of the following must be present: pus from one or both eyes **OR** redness with or without itching or pain. Both trauma and allergies must be ruled out.

Ear infection

One of the following must be present: physician diagnosis **OR** new purulent drainage fluid accumulated in the middle ear accompanied by ear pain or tympanic redness.

Oral infection

Oral infections must be physician diagnosed.

Sinusitis

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

1. physician diagnosed,
2. organisms cultured from purulent material obtained from sinus cavity, or
3. patient has at least **one** of the following signs or symptoms with no other recognized cause: fever; pain or tenderness over the involved sinus; headache, purulent exudate or nasal obstruction **AND** at least one of the following: positive transillumination **OR** positive radiographic examination.

GASTROINTESTINAL INFECTIONS

Gastroenteritis

One of the following three criteria must be met:

1. two or more loose watery stools in 24 hours above what is normal for the client;
2. two or more vomiting episodes in 24 hours; **OR**
3. both a stool culture positive for a gastrointestinal pathogen **AND** signs or symptoms compatible with gastrointestinal infection (nausea, vomiting, abdominal pain or tenderness, or diarrhea). Noninfectious causes, such as tube feedings or medication side effects, must be ruled out.

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