Appendix D: Recommended Case Definitions for Surveillance of Health Care-Associated Infections in Long-term Care Homes

This resource is an excerpt from Best Practices for Surveillance of Health Care-associated Infections and was reformatted for ease of use.

NOTE: Long-term care surveillance definitions in previous versions of this document were originally published by McGeer et al.[93] in 1991. A current re-visitation of these definitions has been proposed by Stone et al.[94] in 2012, and are summarized in this Appendix.

A. RESPIRATORY TRACT INFECTION

I. Common Cold Syndromes/Pharyngitis

The resident must have *at least two* of the following signs or symptoms:

1. runny nose or sneezing
2. stuffy nose (i.e., congestion)
3. sore throat or hoarseness or difficulty in swallowing
4. dry cough
5. swollen or tender glands in the neck (cervical lymphadenopathy).

Comment:

Fever may or may not be present. Symptoms must be new, and care must be taken to ensure that they are not caused by allergies.

II. Influenza-like Illness (ILI)

Both of the following criteria must be met:

1. Fever (see Comments)

AND

2. The resident must have *at least three* of the following signs or symptoms:
   a) chills
   b) new headache or eye pain
   c) myalgias or body aches
   d) malaise or loss of appetite
   e) sore throat
   f) new or increased dry cough.

Comments:

If criteria for influenza-like illness and another upper or lower respiratory tract infection are met at the same time, only the diagnosis of influenza-like illness should be recorded.

Because of increasing uncertainty surrounding the timing of the start of influenza season, the peak of influenza activity, and the length of the season, “seasonality” is no longer a criterion to define influenza-like illness.

Fever:

- single oral temperature >37.8° C
  OR
- repeated oral temperatures >37.2° C or rectal temperatures >37.5° C
  OR
- single temperature >1.1° C over baseline from any site (oral, tympanic, axillar)

III. Pneumonia

All three of the following criteria must be met:

1. Interpretation of a chest radiograph as demonstrating pneumonia, or the presence of a new infiltrate.

   AND
2. The resident must have *at least one* of the following:
   a) new or increased cough
   b) new or increased sputum production
   c) O_2 saturation <94% on room air or a reduction in O_2 saturation of >3% from baseline
   d) new or changed lung examination abnormalities
   e) pleuritic chest pain
   f) respiratory rate of ≥ 25 breaths/minute

   AND
3. *At least one* of the following constitutional criteria (see box):
   a) fever
   b) leukocytosis
   c) acute change in mental status from baseline
   d) acute functional decline

Comments:

Non-infectious causes of symptoms must be ruled out. In particular, congestive heart failure or interstitial lung disease may produce symptoms and signs similar to those of respiratory infections.

Constitutional Criteria:

Fever:

- single oral temperature >37.8° C
  OR
- repeated oral temperatures >37.2° C or rectal temperatures >37.5° C
  OR
- single temperature >1.1° C over baseline from any site (oral, tympanic, axillar)

Leukocytosis:

- neutrophilia (>14,000 leukocytes/mm^3)
  OR
- left shift (>6% bands or ≥1,500 bands/mm^3

Acute change in mental status from baseline (all criteria must be present):

- acute onset
- fluctuating course
- inattention
  AND
- either disorganized thinking or altered level of consciousness

Acute functional decline: A new 3-point increase in total activities of daily living score from baseline, based on the following seven items, each scored from 0 (independent) to 4 (total dependence):

- bed mobility
- transfer
- locomotion within the long-term care home
- dressing
- toilet use
- personal hygiene
  eating

IV. Lower Respiratory Tract Infection (bronchitis, tracheobronchitis)

The resident must have *all three* of the following signs or symptoms:

a) Chest radiograph not performed or negative results for pneumonia or new infiltrate

   AND

b) *At least two* of the following respiratory criteria:

   i) new or increased cough
   ii) new or increased sputum production
   iii) O_2 saturation <94% on room air or a reduction in O_2 saturation of >3% from baseline
   iv) new or changed lung examination abnormalities
   v) pleuritic chest pain
   vi) respiratory rate of ≥ 25 breaths/minute

   AND

c) *At least one* of the constitutional criteria listed in box, Section A.III, above

Comments:

Non-infectious causes of symptoms must be ruled out. In particular, congestive heart failure or interstitial lung disease may produce symptoms and signs similar to those of respiratory infections.

See box, Section A.III for additional comments relating to respiratory and constitutional criteria.

B. URINARY TRACT INFECTION (UTI)

Urinary tract infection includes only symptomatic urinary tract infections. Surveillance for asymptomatic bacteriuria (defined as the presence of a positive urine culture in the absence of new signs and symptoms of urinary tract infection) is not recommended, as this represents baseline status for many residents.

Symptomatic Urinary Tract Infection

Indwelling catheter NOT present

Both of the following criteria must be met:

1. The resident has *at least one* of the following signs and symptoms:
    a) Acute dysuria or acute pain, swelling, or tenderness of the testes, epididymis, or prostate

    OR

    b) Fever or leukocytosis (see Box, above) and *at least one* of the following:
        i) acute costovertebral angle pain or tenderness
        ii) suprapubic pain
        iii) gross hematuria
        iv) new or marked increase in incontinence
        v) new or marked increase in urgency
        vi) new or marked increase in frequency

    OR

    c) In the absence of fever or leukocytosis, *two or more* of the following are present:
        i) suprapubic pain
        ii) gross haematuria
        iii) new or marked increase in incontinence
        iv) new or marked increase in urgency
        v) new or marked increase in frequency

    AND

2. The resident has *one* of the following microbiologic criteria:
    a) At least 10^5 cfu/mL of no more than two species of microorganisms in a voided urine sample

    OR

    b) At least 10^2 cfu/mL of any number of organisms in a specimen collected by in-and-out catheter

Indwelling catheter present

Both of the following criteria must be met:

1. The resident has *at least one* of the following signs or symptoms:
    a) Fever, rigors, or new onset hypotension, with no alternate site of infection
    b) Either acute change in mental status or acute functional decline, with no alternate diagnosis, and leukocytosis (see box, Section A.III)
    c) New onset suprapubic pain or costovertebral angle pain or tenderness
    d) Purulent discharge from around the catheter or acute pain, swelling, or tenderness of the testes, epididymis, or prostate

    AND

2. The resident has a urinary catheter specimen culture with at least 10^5 cfu/mL of any organism

Comments:

UTI should be diagnosed when there are localizing genitourinary signs and symptoms and a positive urine culture result. A diagnosis of UTI can be made without localizing symptoms if a blood culture isolate is the same as the organism isolated from the urine and there is no alternate site of infection. In

the absence of a clear alternate source of infection, fever or rigors with a positive urine culture result in the noncatheterized resident or acute confusion in the catheterized resident will often be treated as UTI. However, evidence suggests that most of these epidsodes are likely not due to infection of a urinary source.

Urine specimens for culture should be processed as soon as possible, preferably within one to two hours after collection. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated. Refrigerated specimens should be cultured within 24 hours.

Recent catheter trauma, catheter obstruction, or new onset haematuria are useful localizing signs that are consistent with UTI but are not necessary for diagnosis.

Urinary catheter specimens for culture should be collected following replacement of the catheter if the current catheter has been in place for more than 14 days.

C. EYE, EAR, NOSE, AND MOUTH INFECTION

Conjunctivitis

At least one of the following criteria must be present:

1. Pus appearing from one or both eyes, present for at least 24 hours

   OR

2. New or increased conjunctival erythema, with or without itching

   OR

3. New or increased conjunctival pain, present for at least 24 hours

Comments:

Conjunctivitis symptoms (“pink eye”) should not be due to allergic reaction or trauma.

Ear Infection

One of the following criteria must be met:

1. Diagnosis by a physician* of any ear infection

   OR

2. New drainage from one or both ears (non-purulent drainage must be accompanied by additional symptoms, such as ear pain or redness).

* Requires a written note or a verbal report from a physician specifying the diagnosis. Usually implies direct assessment of the resident by a physician. An antibiotic order alone does not fulfill this criterion. In some homes, it may be appropriate also to accept a diagnosis made by other qualified clinicians (e.g., nurse practitioner, physician associate).

Mouth and Perioral Infection

Oral and perioral infections, including oral candidiasis (manifest by the presence of raised white patches on inflamed mucosa or plaques on oral mucosa), must be diagnosed by a physician or a dentist.

Comments:

Mucocutaneous *Candida* infections are usually due to underlying clinical conditions, such as poorly controlled diabetes or severe immunosuppression. Although they are not transmissible infections in the health care setting, they can be a marker for increased antibiotic exposure.

IV. Sinusitis

The diagnosis of sinusitis must be made by a physician.

D. SKIN INFECTION

I. Cellulitis/Soft Tissue/Wound Infection

One of the following criteria must be met:

1. Pus present at a wound, skin, or soft tissue site

   OR

2. The resident must have *at least four* of the following signs or symptoms:
   a) heat at the affected site
   b) redness at the affected site
   c) swelling at the affected site
   d) tenderness or pain at the affected site
   e) serous drainage at the affected site
   f) one constitutional criterion (see box, Section A.III)

Comments:

Presence of organisms cultured from the surface (e.g., superficial swab sample) of a wound is not sufficient evidence that the wound is infected. More than one resident with streptococcal skin infection from the same serogroup in a long-term care home may indicate an outbreak.

II. Fungal Skin Infection

The resident must have *both*:

1. A characteristic rash or lesion

   AND

2. Either physician diagnosis or laboratory confirmation from a scraping or a medical biopsy (see Comments)

Comments:

Dermatophytes have been known to cause occasional infections and rare outbreaks in the long-term care setting.

III. Herpesvirus

For a diagnosis of cold sores (herpes simplex) or shingles (herpes zoster), the resident must have *both*:

1. A vesicular rash

   AND

2. Either physician diagnosis or laboratory confirmation (see Comments).

Comments:

Reactivation of herpes simplex ('cold sores') or herpes zoster ('shingles') is not considered a health care-associated infection. Primary herpesvirus skin infections are very uncommon in a long-term care home.

For herpetic infections, laboratory confirmation includes positive electron microscopy or culture of scraping or swab.

IV. Scabies

The resident must have *both*:

1. A maculopapular and/or itching rash

   AND

2. *At least one* of the following:
   a) physician diagnosis
   b) laboratory confirmation (scraping or biopsy)
   c) epidemiologic linkage to a case of scabies with laboratory confirmation

Comments:

Care must be taken to rule out rashes due to skin irritation, allergic reactions, eczema and other non-infectious skin conditions.

An epidemiologic linkage to a case can be considered if there is evidence of geographic proximity in the facility, temporal relationalship to the onset of symptoms, or evidence of common source of exposure (i.e., shared caregiver).

E. GASTROINTESTINAL (GI) TRACT INFECTION

Gastroenteritis

One of the following criteria must be met:

1. Three or more liquid or watery stools above what is normal for the resident within a 24-hour period

   OR

2. Two or more episodes of vomiting in a 24-hour period

   OR

3. *Both* of the following:
   a) a stool culture positive for a pathogen (e.g., *Salmonella*, *Shigella*, *E. coli O157:H7*, *Campylobacter spp*., rotavirus)

      AND

   b) *at least one* of the following symptoms:
      i) nausea
      ii) vomiting
      iii) abdominal pain or tenderness
      iv) diarrhea

Comments:

Care must be taken to rule out non-infectious causes of symptoms. For instance, new medication may cause both diarrhea and vomiting; nausea and vomiting may be associated with gallbladder disease; initiation of new enteral feeding may be associated with diarrhea. Presence of new GI symptoms in a single resident may prompt enhanced surveillance for additional cases. In the presence of an outbreak, stool specimens should be sent to confirm the presence of norovirus or other pathogens (e.g., rotavirus or *E. coli O157:H7*).

Norovirus Gastroenteritis

Both of the following criteria must be present:

1. *At least one* of the following:
    a) three or more liquid or watery stools above what is normal for the resident within a 24-hour period
    b) two or more episodes of vomiting in a 24-hour period

    AND

2. A stool specimen for which norovirus is positively detected by electron microscopy, enzyme immunoassay, or molecular diagnostic testing, such as polymerase chain reaction (PCR)

Comments:

In the absence of laboratory confirmation, an outbreak (two or more cases occurring in a long-term care home) of acute gastroenteritis due to norovirus infection may be assumed to be present if all of the following criteria are present:

- vomiting in more than half of affected persons
- a mean/median incubation period of 24 to 48 hours
- a mean/median duration of illness of 12 to 60 hours
- no bacterial pathogen is identified in stool culture

***Clostridium difficile* Infection (CDI)**

Both of the following criteria must be present:

1. *At least one* of the following:
    a) three or more liquid or watery stools above what is normal for the resident within a 24-hour period
    b) presence of toxic megacolon (abnormal dilation of the large bowel, documented radiologically)

    AND

2. *At least one* of the following diagnostic criteria:
    a) a stool sample yields a positive laboratory test result for *C. difficile* toxin A or B, or a toxin-producing *C. difficile* organism is identified from a stool sample
    b) pseudomembranous colitis is identified during endoscopic examination or surgery or in histopathologic examination of a biopsy specimen

Comments:

A primary episode of *C. difficile* infection (CDI) is defined as one that has occurred without any previous history of CDI or that has occurred more than eight weeks after the onset of a previous episode.

A recurrent episode of CDI is defined as an episode of CDI that occurs eight weeks or sooner after the onset of a previous episode, provided that the symptoms from the previous episode have resolved.

Individuals previously infected with *C. difficile* may continue to remain colonized even after symptoms resolve. In the setting of an outbreak of CDI, individuals could have positive test results for the presence of *C. difficile* toxin because of ongoing colonization and also be co-infected with another pathogen. It is important that other surveillance criteria be used to differentiate infections in this situation.

F. SYSTEMIC INFECTION

I. Primary Bloodstream Infection

One of the following criteria must be met:

1. Two or more blood cultures positive for the same organism

   OR

2. A single blood culture documented with an organism thought not to be a contaminant and *at least one* of the following:
   a) fever (see box, Section A.III)
   b) new hypothermia (<34.5° C, or does not register on the thermometer being used)
   c) a drop in systolic blood pressure of 30 mm Hg from baseline
   d) worsening mental or functional status.

Comment:

Bloodstream infections related to infection at another site are reported as secondary bloodstream infections and are not included as separate infections.

II. Unexplained Febrile Episode

The resident must have documentation in the medical record of fever (see box, Section A.III) on two or more occasions at least 12 hours apart in any 3-day period, with no known infectious or non-infectious cause.

For more information, see the Best Practices for Best Practices for Surveillance of Health Care-associated Infections or email ipac@oahpp.ca.

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