Pan-Canadian Healthcare Infection Surveillance Definition Standardization Project
Long Term Care Infection Surveillance Definitions

In partnership with:

Accreditation Canada
Association of Medical Microbiology and Infectious Diseases Canada
Canadian Patient Safety Institute
Centre for Communicable Disease and Infection Control, Public Health Agency of Canada
Infection Prevention and Control Canada

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The Canadian Patient Safety Institute and the Public Health Agency of Canada (PHAC) hosted a national infection prevention and control (IPAC) summit in November 2014. Over 40 participants came together with the goal of advancing IPAC practices and reducing healthcare-associated infections in Canada. At this meeting, measurement and surveillance, specifically improving consistency in surveillance practices across the country, surfaced as a key theme and an action plan was created. Under the leadership of Infection Prevention and Control Canada (IPAC Canada) and the Association of Medical Microbiology and Infectious Diseases Canada (AMMI Canada) a committee was created to help establish and implement standard healthcare infection surveillance definitions for healthcare associated infections (HAI) in acute care and long term care (LTC).

Members of IPAC's Surveillance and Epidemiology (SAEIG) and Long Term Care (LTC) Interest Groups and the L'Association des infirmières en prévention des infections (AIPI) formed a working group to revise the existing Stone et al. (2012) LTC infection surveillance definitions based on the Canadian healthcare system and an increase in evidence-based literature about some types of infection in the elderly in LTC settings. The Centers for Disease Control (CDC) Healthcare Infection Control Practices Advisory Committee (HICPAC) guideline development methodology (2013) was used to revise the definitions.

TABLE 1: Definitions for Constitutional Criteria

A. Fever
1. Single oral temperature >37.8°C
   OR
2. Repeated oral temperatures >37.2°C or rectal temperatures >37.5°C
   OR
3. Single temperature >1.1°C over baseline from any site (oral, tympanic, auxiliary)

B. Leukocytosis > 10 x 10^9 leukocytes/L

C. Acute change in mental status from baseline (all criteria must be present; see Table 2)
1. Acute onset
2. Fluctuating course
3. Inattention
4. Either disorganized thinking or altered level of consciousness

D. Acute functional decline

A new 3-point increase in total activities of daily living (ADL) score (range, 0–28) from baseline, based on the following 7 ADL items, each scored from 0 (independent) to 4 (total dependence)[14]
1. Bed mobility
2. Transfer
3. Locomotion within LTC facility
4. Dressing
5. Toilet use
6. Personal hygiene

7. Eating

TABLE 2. Confusion Assessment Method Criteria	
NOTE. Criteria must be assessed during a formal interview with the client. Criteria are adapted from studies by Inouye *et al.* (1990) and Lim and MacFarlane (2001)	
Criteria	**Comments**
Acute onset	Evidence of acute change in resident's mental status from baseline
Fluctuating	Behavior fluctuating (e.g., coming and going or changing in severity during the assessment)
Inattention	Resident has difficulty focusing attention (e.g., unable to keep track of discussion or easily distracted)
Disorganized thinking	Resident's thinking is incoherent (e.g., rambling conversation, unclear flow of ideas, unpredictable switches in subject)
Altered level of consciousness	Resident's level of consciousness is described as different from baseline (e.g., hyperalert, sleepy, drowsy, difficult to arouse, nonresponsive)

TABLE 3. Surveillance Definitions for Respiratory Tract Infections (RTIs)	
NOTE. Epidemiological confirmation, instead of a laboratory positive specimen, can be used to meet case definition criteria. A case is considered epidemiologically confirmed by direct contact to a laboratory-confirmed case through person-to-person transmission or through a common exposure (e.g. food)	
Criteria	**Comments**
A. Common cold syndrome or pharyngitis (at least 2 criteria must be present) 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) 6. N/P swab positive for a respiratory pathogen	Fever may or may not be present. Symptoms must be new and not attributable to allergies.
B. Influenza-like illness (criteria 1 and/or 2 must be present, AND 3 or 4) 1. Fever 2. New and or increased cough 3. At least 2 of the following influenza-like illness subcriteria a. Chills b. New headache or eye pain c. Myalgias or body aches d. Malaise or loss of appetite e. Sore throat f. Arthralgia (joint pain) 4. N/P swab positive for Influenza virus	Fever may not be present in the elderly. If criteria for influenza-like illness and another upper or lower RTI 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.
C. Pneumonia (criteria 1 and 2 must be present, OR criteria 1 and 3) 1. Interpretation of a chest radiograph as demonstrating pneumonia or the presence of a new infiltrate 2. At least 1 of the following respiratory subcriteria a. New or increased cough	For both pneumonia and lower RTI, the presence of underlying conditions that could mimic the presentation of a RTI (e.g., congestive heart failure or interstitial lung diseases) should be excluded by a review of clinical records and an assessment of presenting symptoms and signs.

b. New or increased sputum production c. O2 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/min 3. At least 1 constitutional criteria (see Table 1)	
D. Lower respiratory tract infection (bronchitis or tracheobronchitis; all 3 criteria must be present) 1. Chest radiograph not performed or negative results for pneumonia or new infiltrate 2. At least 2 of the respiratory subcriteria (a–f) listed in section C above 3. At least 1 of the constitutional criteria (see Table 1)	(See comment for section C above.)

TABLE 4. Surveillance Definitions for Urinary Tract Infections (UTIs)	
NOTE. A urinalysis negative for leukocytes effectively rules out a UTI while a urinalysis positive for leukocytes does not differentiate symptomatic UTI from asymptomatic bacteriuria. cfu, colony-forming units.	
Criteria	**Comments**
A. For residents without an indwelling catheter (criteria 1 and 2 must be present with no other identified source of infection, OR criteria 2 and 3) 1. At least 1 of the following sign or symptom subcriteria 1. Acute pain, swelling, or tenderness of the testes, epididymis, or prostate, in males 2. Fever or leukocytosis (see Table 1) and at least 1 of the following localizing urinary tract subcriteria a. Acute dysuria b. Acute costovertebral angle pain or tenderness c. Suprapubic pain d. Gross hematuria e. New or marked increase in incontinence f. New or marked increase in urgency g. New or marked increase in frequency 3. In the absence of fever or leukocytosis, then 2 or more of the following localizing urinary tract subcriteria a. Acute dysuria b. Suprapubic pain c. Gross hematuria d. New or marked increase in incontinence e. New or marked increase in urgency f. New or marked increase in	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 episodes are likely not due to infection of a urinary source.

frequency	
2. 10^8cfu/L of no more than 2 species of microorganisms from a specimen collected by an in and out catheter, or alternately a midstream urine	Urine specimens for culture should be processed as soon as possible, preferably within 1–2 h. If urine specimens cannot be processed within 30 min of collection, they should be refrigerated. Refrigerated specimens should be cultured within 24 h. In and out catheter collection is the gold standard for urine collection.
3. A blood culture isolate is the same as the organism isolated from the urine and there is no alternate site of infection	
B. For residents with an indwelling in a single catheter urine specimen or in a midstream voided urine specimen from a resident whose catheter has been removed within the previous 48 h (criteria 1 and 2 must be present with no other identified source of infection, OR criteria 2 and 3) 1. At least 1 of the following sign or symptom subcriteria 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 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 in males	Recent catheter trauma, catheter obstruction, or new onset hematuria are useful localizing signs that are consistent with UTI but are not necessary for diagnosis.
2. Urinary catheter specimen culture with ≥ 10^8cfu/L of any organism(s)	Urinary catheter specimens for culture should be collected following replacement of the catheter (if current catheter has been in place for >14 d).
3. A blood culture isolate is the same species as the organism isolated from the urine, with the same resistance pattern, and there is no alternate site of infection	

TABLE 5. Surveillance Definitions for Skin, Soft Tissue, and Mucosal Infections

NOTE. For wound infections related to surgical procedures, LTC facilities should use the Centers for Disease Control and Prevention's National Healthcare Safety Network Surgical Site Infection criteria and report these infections back to the institution where the original surgery was performed.

Criteria	Comments
A. Cellulitis, soft tissue, or wound infection (at least 1 of the following criteria must be present) 1. Pus present at a wound, skin, or soft tissue site 2. New or increasing presence of at least 4 of the following sign or symptom subcriteria 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 Table 1) 3. Non-commensal organism isolated with 1 or more signs or symptoms from criteria 2	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 1 resident with streptococcal skin infection from the same serogroup (e.g., A, B, C, G) in a long-term care facility (LTCF) may indicate an outbreak. Common commensal organisms include diphtheroids (*Corynebacterium spp*. not *C. diphtheria*), *Bacillus spp*. [not *B. anthracis*], *Propionibacterium spp*., coagulase-negative staphylococci (including *S. epidermidis*), viridans group streptococci, *Aerococcus spp*., and *Micrococcus spp.*

B. Scabies (both criteria 1 and 2 must be present) 1. A maculopapular and/or itching rash characteristic of scabies 2. At least 1 of the following scabies subcriteria a. Physician diagnosis b. Laboratory confirmation (scraping or biopsy) c. Epidemiologic linkage to a case of scabies with laboratory confirmation	Consider the appearance and distribution of the rash. The most common symptom of scabies is itching (pruritis) especially at night and pimple (papular) like rash. The itching and rash may affect much of the body or be limited to common sites such as wrists, elbow, armpit, webbing between the fingers, nipple, penis, waist, beltline and buttocks. Tiny burrows that are raised and crooked, grayish white or skin coloured lines on the skin surface. They are found most often in the webbing between the fingers, in the skin folds of the wrist, elbow or knee and on the penis, breast or shoulder blades. If rash presentation is atypical, lab confirmation is recommended. An epidemiologic linkage to a case can be considered if there is evidence of geographic proximity in the facility, temporal relationship to the onset of symptoms, or evidence of common source of exposure (i.e., shared caregiver). Care must be taken to rule out rashes due to skin irritation, allergic reactions, eczema, and other noninfectious skin conditions.
C. Fungal oral or perioral and skin infections 1. Oral candidiasis (both criteria a and b must be present) a. Presence of raised white patches on inflamed mucosa or plaques on oral mucosa b. Diagnosis by a medical or dental provider 2. Fungal skin infection (both criteria a and b must be present) a. Characteristic rash or lesions b. Either a diagnosis by a medical provider or a laboratory confirmed fungal pathogen from a scraping or a medical biopsy	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 healthcare setting, they can be a marker for increased antibiotic exposure. Dermatophytes have been known to cause occasional infections and rare outbreaks in the LTCF setting.
D. Herpesvirus skin infections 1. Herpes simplex infection (both criteria a and b must be present) a. A vesicular rash b. Either physician diagnosis or laboratory confirmation 2. Herpes zoster infection (both criteria a and b must be present) a. A vesicular rash b. Either physician diagnosis or laboratory confirmation	Reactivation of herpes simplex (“cold sores”) or herpes zoster (“shingles”) is not considered a healthcare-associated infection. Primary herpesvirus skin infections are very uncommon in a LTCF except in pediatric populations, where it should be considered healthcare associated.
E. Conjunctivitis (at least 1 of the following criteria must be present) 1. Pus appearing from 1 or both eyes, present for at least 24 h 2. New or increased conjunctival erythema, with or without itching 3. New or increased conjunctival pain, present for at least 24 h	Conjunctivitis symptoms (“pink eye”) should not be due to allergic reaction or trauma.

TABLE 6. Surveillance Definitions for Gastrointestinal (GI) Tract Infections	
NOTE. Epidemiological confirmation, instead of a laboratory positive specimen, can be used to meet case definition criteria. A case is considered epidemiologically confirmed by direct contact to a laboratory-confirmed case through person-to-person transmission or through a common exposure (e.g. food)	
Criteria	**Comments**
A. Gastroenteritis (at least 1 of the following criteria must be present) 1. Diarrhea: 3 or more loose or watery stools above what is normal for the resident within a 24-h period 2. Vomiting: 2 or more episodes in a 24-h period 3. Both of the following sign or symptom subcriteria a. A stool specimen testing positive for a pathogen (e.g., *Salmonella*, *Shigella*, *Escherichia coli* O157:H7, *Campylobacter* species, rotavirus) b. At least 1 of the following GI subcriteria i. Nausea ii. Vomiting iii. Abdominal pain or tenderness iv. Diarrhea v. mucous in stool	Care must be taken to exclude noninfectious causes of symptoms. For instance, new medications may cause diarrhea, nausea, or vomiting; initiation of new enteral feeding may be associated with diarrhea; and nausea or vomiting may be associated with gallbladder disease. 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).
B. Norovirus gastroenteritis (both criteria 1 and 2 must be present) 1. At least 1 of the following GI subcriteria a. Diarrhea: 3 or more loose or watery stools (i.e. Conforming to the shape of the specimen collection container) above what is normal for the resident within a 24-h period b. Vomiting: 2 or more episodes of in a 24-h period 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)	
C. *Clostridium difficile* infection (both criteria 1 and 2 must be present) 1. One of the following GI subcriteria a. Diarrhea: 3 or more loose or watery stools (i.e. Conforming to the shape of the specimen collection container) above what is normal for the resident within a 24-h period b. Presence of toxic megacolon (abnormal dilatation of the large bowel, documented radiologically) 2. One of the following diagnostic subcriteria 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 culture or by a molecular diagnostic test such as PCR b. Pseudomembranous colitis is identified during endoscopic examination or surgery	A "primary episode" of *C. difficile* infection is defined as one that has occurred without any previous history of *C. difficile* infection or that has occurred 8 weeks after the onset of a previous episode of *C. difficile* infection. A "recurrent episode" of *C. difficile* infection is defined as an episode of *C. difficile* infection that occurs 8 weeks or sooner after the onset of a previous episode, provided that the symptoms from the earlier (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 GI infection, individuals could have positive test results for 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.

or in histopathologic examination of a biopsy specimen	

Table 7. Blood Stream Infections
Adhere to CDC's National Healthcare Safety Network (NHSN) definitions

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