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2018 CNISP HAI Surveillance Case definitions

The following case definitions for the surveillance of healthcare-associated infections (HAIs) are used by all acute-care hospitals that participate in the Canadian Nosocomial Infection Surveillance Program (CNISP)

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2018 CNISP Surveillance for *Clostridium difficile* infection (CDI)

Surveillance case definition for primary episodes of CDI

A "primary" episode of CDI is defined as either the first episode of CDI ever experienced by the patient or a new episode of CDI which occurs greater than eight (8) weeks after the diagnosis of a previous episode in the same patient.

A patient is identified as having CDI if:

- the patient has diarrhea* or fever, abdominal pain and/or ileus **AND** a laboratory confirmation of a positive toxin assay or positive polymerase chain reaction (PCR) for *C.difficile* (without reasonable evidence of another cause of diarrhea)

OR

- the patient has a diagnosis of pseudomembranes on sigmoidoscopy or colonoscopy (or after colectomy) or histological/pathological diagnosis of CDI

OR

- the patient is diagnosed with toxic megacolon (in adult patients only)

*Diarrhea is defined as one of the following:

- 6 or more watery/unformed stools in a 36-hour period
- 3 or more watery/ unformed stools in a 24-hour period and this is new or unusual for the patient (in adult patients only)

Exclusion

- Any patients age less than 1 year.
- Any pediatric patients (aged 1 year to less than 18 years) with alternate cause of diarrhea found (i.e. rotavirus, norovirus, enema or medication etc.) are excluded even if *C. difficile* diagnostic test result is positive.

Please note that starting in 2017; we will no longer accept an asymptomatic case identified only by a laboratory confirmation of a positive toxin assay or PCR for C. difficile. (i.e., a patient must have diarrhea or fever, abdominal pain and/or ileus AND a laboratory confirmation of a positive toxin assay or PCR for C. difficile to be identified as having CDI).

CDI case classification

Once a patient has been identified with CDI, the infection will be classified further based on the following criteria[1] and the *best clinical judgment* of the healthcare and/or infection prevention and control practitioner (ICP).

[1] Adapted from SHEA/IDSA practice recommendations 'Strategies to Prevent Clostridium difficile Infections in Acute Care Hospitals: 2014 Update '– available at URL http://www.jstor.org/stable/10.1086/676023?origin=JSTOR-pdf

Healthcare-associated (acquired in your facility) **CDI case definition**

- **Related to the current hospitalization**
  - The patient's CDI symptoms occur in your healthcare facility 3 or more days (or ≥72 hours) after admission.
- **Related to a previous hospitalization**
  - **Inpatient**: The patient's CDI symptoms occur less than 3 days after the current admission (or <72 hours) AND the patient had been previously hospitalized at your healthcare facility and discharged within the previous 4 weeks.
  - **Outpatient**: The patient presents with CDI symptoms at your ER or outpatient location[2] AND the patient had been previously hospitalized at your healthcare facility and discharged within the previous 4 weeks.
- **Related to a previous healthcare exposure[3] at your facility**
  - **Inpatient**: The patient's CDI symptoms occur less than 3 days after the current admission (or <72 hours) AND the patient had a previous healthcare exposure[3] at your facility within the previous 4 weeks.
  - **Outpatient**: The patient presents with CDI symptoms at your ER or outpatient location[2] AND the patient had a previous healthcare exposure[3] at your facility within the previous 4 weeks.

Healthcare-associated (acquired in any other healthcare facility[4]) **CDI case definition**

- **Related to a previous hospitalization at any other healthcare facility**
  - **Inpatient**: The patient's CDI symptoms occur less than 3 days after the current admission (or <72 hours) AND the patient is known to have been previously hospitalized at any other healthcare facility[4] and discharged/transferred within the previous 4 weeks.
  - **Outpatient**: The patient presents with of CDI symptoms at your ER or outpatient location AND the patient is known to have been previously hospitalized at any other healthcare facility[4] and discharged/transferred within the previous 4 weeks.
- **Related to a previous healthcare exposure[3] at any other healthcare facility**
  - **Inpatient**: The patient's CDI symptoms occur less than 3 days after the current admission (or <72 hours) AND the patient is known to have a previous healthcare exposure[3] at any other healthcare facility[4] within the previous 4 weeks.
  - **Outpatient**: The patient presents with of CDI symptoms at your ER or outpatient location AND the patient is known to have a previous healthcare exposure[3] at any other healthcare facility[4] within the previous 4 weeks.

Healthcare-associated CDI but unable to determine which facility

- The patient with CDI **DOES** meet both definitions of healthcare-associated (acquired in your facility) and healthcare-associated (acquired in any other healthcare facility[4]), but unable to determine to which facility the case is primarily attributable to.

C***ommunity-associated*** **CDI case definition**

- **Inpatient**: The patient's CDI symptoms occur less than 3 days (or <72 hours) after admission, with no history of hospitalization or any other healthcare exposure[3] within the previous 12 weeks.
- **Outpatient**: The patient presents with CDI symptoms at your ER or outpatient location with no history of hospitalization or any other healthcare exposure[3] within the previous 12 weeks.

[2] This includes all of your outpatient clinics (oncology [including chemotherapy or radiation], dialysis, day surgery, day hospital, transfusion clinic, interventional radiology), but may not be exhaustive.

[3] Healthcare exposure: The patient had 2 or more visits at any of the following locations (oncology [including chemotherapy or radiation], dialysis, day surgery, day hospital, transfusion clinic, interventional radiology or emergency department) OR had a single visit to the emergency department for more than or equal to 24 hours.

[4] Any other healthcare facility which includes other acute-care, psychiatric, rehabilitation or long-term care facility

***Indeterminate* CDI case definition**

- The patient with CDI does NOT meet any of the definitions listed above for healthcare-associated or community-associated CDI**.** The symptom onset was more than 4 weeks but less than 12 weeks after the patient was discharged from any healthcare facility or after the patient had any other healthcare exposure[3].

Surveillance case definition for recurrent CDI

Recurrent CDI case definition

- A recurrent case of CDI is defined as an episode of CDI that occurs in a patient less than or equal to eight (8) weeks[5] following the diagnostic test date of the primary episode of CDI, providing the patient was treated successfully for the primary episode and symptoms of CDI resolved completely.

Note: A new episode of CDI that occurs after eight (8) weeks following the diagnostic test date of the primary episode of CDI is considered a new infection.

[5] Some hospitals may define a CDI case (successfully treated and symptoms resolved) that occurs ≤ 8 weeks after a previous case as a 'relapse' however for CNISP CDI surveillance this is defined as a 'recurrent' CDI case

2018 CNISP Surveillance for Methicillin-Resistant and Methicillin-Susceptible *Staphylococcus aureus* Bloodstream Infections in CNISP Hospitals

MSSA and MRSA infection surveillance inclusion criteria

Case definition	
MSSA	**MRSA**
• isolation of *Staphylococcus aureus* from blood AND • patient must be admitted to the hospital AND • is a "newly identified *S. aureus* infection" at a CNISP hospital at the time of hospital admission or identified during hospitalization.	• isolation of *Staphylococcus aureus* from blood AND • resistance of isolate to oxacillin and/or laboratory confirmation of *mec* (phenotypic or genotypic) AND • patient must be admitted to the hospital AND • is a "newly identified MRSA infection" at a CNISP hospital at the time of hospital admission or identified during hospitalization.

This includes:

- MSSA or MRSA BSIs identified for the first time during this current hospital admission.
- MSSA or MRSA BSIs that have already been identified at your site or another CNISP site but are new infections.

Criteria to determine if it is a new MSSA or MRSA BSI:
> 14 days since previously treated MSSA or MRSA BSI and in the judgement of Infection Control physicians and practitioners represents a new infection

MSSA and MRSA infection surveillance exclusion criteria

- Emergency, clinic, or other outpatient cases who are **NOT admitted** to the hospital.

Once the patient has been identified with a MSSA or MRSA BSI, they will be classified as Healthcare-associated any other healthcare exposure (HA-AOHE) or Healthcare-associated your acute-care facility (HA-YAF) based on the following criteria and the ***best clinical judgement*** of the healthcare and/or infection prevention and control practitioner (IPC):

HA-YAF case definition for a MSSA or MRSA BSI:

- Patient is on or beyond calendar day 3[6] of their hospitalization

OR

- Has been hospitalized in your facility in the last 7 days or up to 90 days[7] depending on the source of infection

OR

- Has had a healthcare exposure at your facility that would have resulted in this bacteremia (using best clinical judgement

Newborn HA-YAF case definition for a MSSA or MRSA BSI

I. The newborn is on or beyond calendar day 3[8] of their hospitalization
II. The mother was **NOT** known to have MRSA on admission and there is no epidemiological reason to suspect that the mother was colonized prior to admission, even if the newborn is < 48 hours of age.
III. In the case of a newborn transferred from another institution, MSSA or MRSA BSI may be classified as HA-YAF if the organism was NOT known to be present and there is no epidemiological reason to suspect that acquisition occurred prior to transfer

HA-AOHE case definition for a MSSA or MRSA BSI:

- Any patient who has a bacteremia not acquired at your facility that is thought to be associated with any other healthcare exposure (e.g. another acute-care facility, long-term care, rehabilitation facility, clinic, ER visit or exposure to a medical device).

Community-associated (CA) case definition for a MSSA or MRSA BSI**:**

- No exposure to healthcare that would have resulted in this bacteremia (using best clinical judgement[9]) and does not meet the criteria for a healthcare-associated BSI.

[6] Calendar day 1 is the day of hospital admission

[7] For example, a MSSA/MRSA bacteremia from a surgical wound that occurs 3 weeks after a surgical procedure completed in your facility should be considered HA-YAF (up to 90 days after procedure if implant). A MSSA/MRSA bacteremic pneumonia occurring >7 days after discharge from your facility should not be considered HA-YAF

[8] Calendar day 1 is the day of hospital admission

[9] Consideration should be given to the frequency and nature of exposure to a medical device and/or procedure. For example, pediatric patients with clinic visits for otitis media, asthma, well-baby etc., may or may not be considered as HA while pediatric patients with clinic visits that involved invasive procedures or day surgery may be more likely to be considered HA. Adult patients attending dialysis, receiving chemotherapy, outpatient visits involving invasive procedures or day surgery may be more likely to be considered HA compared to adult patients with occasional outpatient or community health clinic visits.

2018 Surveillance of Vancomycin Resistant *Enterococci* Bloodstream Infections in CNISP Hospitals

Inclusion criteria

- Isolation of *Enterococcus faecalis or faecium* from blood

  AND

- Vancomycin MIC ≥ 8 ug/ml

  AND

- Patient must be admitted to the hospital

  AND

Is a "newly identified VRE BSI" at a CNISP hospital at the time of hospital admission or identified during hospitalization.

A new VRE BSI is defined as a positive VRE blood isolate > 14 days after completing of therapy for a previous infection and felt to be unrelated to previous infection in accordance with best clinical judgement by Infection Control physicians and practitioners

Exclusion criteria

- Emergency, clinic, or other outpatient cases who are not admitted to the hospital.

Once the patient has been identified with a VRE BSI, they will be classified as healthcare-associated acquired in your acute-care facility, healthcare-associated any other healthcare exposure or community-associated based on the following criteria and in accordance with the best clinical judgement of the healthcare and/or infection prevention and control practitioner (ICP).

Healthcare-associated (HA) your acute-care facility:

- Patient is on or beyond calendar day 3[10] of their hospitalization

OR

- Has been hospitalized in your facility in the last 7 days or up to 90 days[11] depending on the source of infection

OR

- Has had a healthcare exposure at your facility that would have resulted in this bacteremia (using best clinical judgement)

Healthcare-associated (HA) any other healthcare exposure:

[10] Calendar day 1 is the day of hospital admission

[11] For example, a VRE bacteremia from a surgical wound that occurs 3 weeks after a surgical procedure completed in your facility should be considered HA - your acute-care facility (up to 90 days after procedure if implant). A VRE bacteremia secondary to UTI occurring >7 days after discharge from your facility should not be considered HA – your acute-care facility.

- Any patient who has a bacteremia not acquired at your facility that is thought to be associated with any other healthcare exposure (e.g. another acute-care facility, long-term care, rehabilitation facility, clinic or exposure to a medical device).

Community-associated (CA):

- No exposure to healthcare that would have resulted in this bacteremia (using best clinical judgement[12]) and does not meet the criteria for a healthcare-associated BSI

[12] Consideration should be given to the frequency and nature of exposure to a medical device and/or procedure. For example, pediatric patients with clinic visits for otitis media, asthma, well-baby etc., may or may not be considered as HA while pediatric patients with clinic visits that involved invasive procedures or day surgery may be more likely to be considered HA. Adult patients attending dialysis, receiving chemotherapy, outpatient visits involving invasive procedures or day surgery may be more likely to be considered HA compared to adult patients with occasional outpatient or community health clinic visits.

2018 CNISP Surveillance for Carbapenemase-Producing Organisms (CPO) in CNISP Hospitals

Eligible cases

Patients admitted to participating CNISP hospitals or a CNISP hospital emergency department or a CNISP hospital-based outpatient clinic that meets the following criteria:

(i) Laboratory confirmation of carbapenem resistance (see Appendix A for laboratory criteria) in *Enterobacteriacae* and *Acinetobacter spp*.

(ii) Collection of positive specimen (including screening isolates) between January 1, 2018 and December 31, 2018.

Gram-negative bacilli eligible for inclusion and laboratory criteria for determining carbapenem resistance

Included in this surveillance project are all clinical samples collected between January 1, 2018 and December 31, 2018 that tested/screened positive for at least one potential carbapenem-resistant *Enterobacteriacae* and/or *Acinetobacter,* using automated systems or 2016 CLSI[13] zone diameters and/or MIC values as listed below:

At least ONE of the following:	***Enterobacteriaceae:***	
	MIC (*µg/ml*)	Disk diffusion[14] (*mm*)
Imipenem	≥ 4	≤ 19
Meropenem	≥ 4	≤ 19
Doripenem	≥ 4	≤ 19
Ertapenem	≥ 2	≤ 18

At least ONE of the following:	***Acinetobacter:***	
	MIC (*µg/ml*)	Disk diffusion[4] (*mm*)
Imipenem	≥ 8	≤18
Meropenem	≥ 8	≤ 14
Doripenem	≥ 8	≤ 14

For eligible *Enterobacteriaceae* isolates (see above table) if a laboratory conducts

CARBA-NP or a commercial equivalent, or modified CIM test (mCIM)

AND/OR

A disk-based phenotypic test, for example, MAST or ROSCO combined disk assays (we suggest the disk based test include a temocillin disk)

THEN

Send only test-positive isolates to the NML. For CARBA-NP and mCIM protocol please refer to CLSI[3]

[13] Clinical and Laboratory Standards Institute. 2017. Performance standards for antimicrobial susceptibility testing; 27th informational supplement, M100-S27 (January 2017). Clinical and Laboratory Standards, Wayne, PA.

[13] Using a 10 µg disk of the appropriate antimicrobial

2018 CNISP Surveillance for Central Line Associated Blood Stream Infections (CLABSI) in Intensive Care Units

ONLY Central line-associated BSIs related to an ICU admission are to be reported.

BSI case definition: The BSI is **NOT** related to an infection at another site and it meets one of the following criteria.

Criterion 1: Recognized pathogen cultured from at least one blood culture, unrelated to infection at another site.

OR

Criterion 2: At least one of: fever (>38°C core), chills, hypotension ; if aged < 1 year: fever (>38°C core), hypothermia (<36°C core), apnea, or bradycardia **AND** common skin contaminant[15] cultured from ≥ 2 blood cultures drawn on separate occasions, or at different sites[16], unrelated to infection at another site.

CLABSI

A laboratory-confirmed bloodstream infection where a central line catheter (CL) or umbilical catheter (UC) was in place for >2 calendar days on the date of the positive blood culture, with day of device placement being Day 1[17].

AND

A CL or UC was in place on the date of the positive blood culture or the day before. If a CL or UC was in place for >2 calendar days and then removed, the BSI criteria must be fully met on the day of discontinuation or the next day. If the patient is admitted or transferred into the ICU with a CL in place, the day of first access[18] is considered Day1.

ICU-related

CLABSI onset during ICU stay and the CL has been in place > 2 calendar days. The CLABSI would be attributable to the ICU if it occurred on the day of transfer or the next calendar day after transfer out of the ICU.

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15 Diphtheroids, *Corynebacterium* spp., *Bacillus* spp, *Propionibacterium* spp., coagulase-negative staphylococci, (including *S. epidermidis*) viridans group streptococci, *Aerococcus* spp., *Micrococcus* spp and *Rhodococcus* spp

16 Different sites may include peripheral veins, CVCs, or separate lumens of a multiumen catheter. Different times include 2 blood cultures collected on the same or consecutive calendar days via separate venipunctures or catheter entries. The collection date of the first positive blood culture is the date used to identify the date of positive culture. Two positive blood culture bottles filled at the same venipuncture or catheter entry constitute only one positive blood culture.

01-Jan-2018	***02-Jan-2018***	***03-Jan-2018***	***04-Jan-2018***	***Date of positive blood culture = 03-Jan-2018***
CL in place ***Fever > 38° C, core***	***CL in place***	***CL in place*** ***S. epidermidis*** (1 of 2 blood cultures)	***CL in place*** ***S. epidermidis*** **(1 of 2 blood cultures)**	

17 NOTE: If admitted or transferred into a facility with a CL/UC in place (e.g., tunneled or implanted central line), day of first access is considered Day 1.

18 "Access" is defined as line placement, infusion or withdrawal through the line.

Exclusions

- Infection already present on admission to ICU

Relapse vs. new infection[19]

Same microorganism (as best as can be determined by the data available – e.g. species, antibiotic sensitivity, etc.) isolated from a subsequent blood culture:

- If ***less*** than or **equal** to 10 days from a negative culture **OR** ***less*** than or **equal** to 10 days from completion of appropriate antibiotic therapy, consider as a relapse and **DO NOT REPORT**.

- If ***greater*** than 10 days from a negative culture (if culture was done) **AND** ***greater*** than 10 days from completion of appropriate antibiotic therapy, **REPORT** as a NEW infection

[19] Definition of relapse vs new infection originated with 2005 CNISP CVC-BSI working group (WG). There was a need to be able to differentiate between infection and relapse and '10 days' was agreed upon by the WG to be an appropriate time frame

2018 CNISP Surveillance of Surgical Sites Infections Following Hip and Knee Arthroplasty

Inclusion & exclusion criteria:

All hospitals that are part of the CNISP network and perform hip and knee arthroplasty procedures.

Inclusions:

- Primary total, hemi and other (e.g. unicondylar) arthroplasties will be included in the surveillance.
- Only clean procedures will be included in the surveillance.

Exclusions:

- Revisions and resurfacings.
- Surgeries in which the patient died in the operating room or within 24 hours of surgery.
- Surgeries where the skin incision is not entirely closed at procedure's end.

2018 CNISP Surveillance for Healthcare Acquired Cerebrospinal Fluid (CSF) Shunt Associated Infections

Inclusion & exclusion criteria

Eligible CNISP hospitals are those able to perform year-round surveillance for CSF shunt-associated infections, and are able to document the number of surgical placements and revisions of shunts.

Patient inclusion criteria

- Person of any age admitted to a CNISP hospital that undergoes placement or revision of a CSF shunting device.
- Infection occurs within one year of surgery.

Patient exclusion criteria:

- Patients with transcutaneous or external shunting devices or non-shunting devices (e.g. Ommaya reservoir).
- Patients whose CSF was culture positive (bacterial or fungal) at the time of placement of the shunt.
- Infections in which the device associated with the positive organism was not placed at the hospital where the infection was identified, i.e. the hospital should not report the infection.

2018 CNISP Surveillance of Surgical Site Infections Following Pediatric Cardiac Surgery

Inclusion & exclusion criteria

All hospitals that are part of the CNISP network and perform pediatric open heart cardiac surgeries.

Inclusions:

- Surgery performed at your CNISP site
- Surgeries where patient is on cardiopulmonary bypass
- SSI identified at your CNISP site (if SSI identified at your hospital but surgery performed at another CNISP site please report the SSI to that CNISP site)

Exclusion:

- Surgeries in which the patient died in the operating room or within 24 hours of surgery