

Surveillance Protocol for *Clostridioides difficile* Infections (CDI) in British Columbia Acute Care Facilities

Revised October 2026

Contact:

Provincial Infection Control Network of BC (PICNet)

#200-1333 W Broadway, Vancouver, BC, V6H 4C1

Phone: (236) 788-4962

E-mail: picnet@phsa.ca

2026-10-19



Ministry of
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PROVINCIAL INFECTION CONTROL
NETWORK OF BRITISH COLUMBIA
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Acknowledgements

We would like to acknowledge the contribution and expertise of the following groups:

- PICNet's Leadership and Surveillance team
- Provincial Infection Prevention and Control Surveillance Working Group (IPC SWG)
- Provincial Infection Prevention and Control Steering Committee (PIPSC)
- Infection Prevention and Control Unit, Communicable Disease Prevention and Control Branch, BC Ministry of Health

Land Acknowledgement

PICNet wishes to acknowledge with gratitude that we work and live on the traditional, ancestral and unceded territories of many B.C. First Nations who have cared and nurtured this land for all time. PICNet's office in Vancouver is located on the traditional land of the $x^w m \theta k^w \dot{a} y \dot{a} m$ (Musqueam), $Skwxwú7mesh$ (Squamish), and $s \dot{a} l i l w \dot{a} t \dot{a} \dot{a}$ (Tsleil-Waututh) Nations. We also acknowledge that there are other Indigenous people that live on these lands that originate from their own respective territories outside of these lands, the Chartered Communities of the Métis Nation B.C., and Inuit.

Summary of changes, 2019-2026

VERSION	DATE	CHANGES
CDI protocol 2019	2019-07-24	Revisions following protocol review by PICNet Surveillance Steering Committee
CDI protocol 2019.v2	2022-08-05	i. PICNet contact details updated ii. Summary of changes added on page 2
CDI protocol 2022	2022-11-16	i. PICNet contact details updated
CDI protocol 2026	2026-10-19	i. Case definition clinical criteria: addition of ≥ 6 unformed stools in 36 hours (alignment with CNISP) ii. Case definition, clinical criteria: 7-day infection window added (Diarrhea must occur within ± 3 days of specimen collection) iii. Case definition, laboratory criteria: addition of two-step testing results iv. Case classification: removal of 'Unknown' category for protocol body (but retained in appendix) v. Complications: Toxic megacolon radiological documentation removed (this is also relevant for Case Definition section) vi. Complication: Toxic megacolon exclusion due to other pathogens removed vii. References updated as required

Abbreviations

BC	British Columbia
CA	Community-Associated
CDI	<i>Clostridioides difficile</i> infections
CNISP	Canadian Nosocomial Infection Surveillance Program
ED	Emergency Department
HCA	Healthcare-associated
ICP	Infection Control Practitioner
ICU	Intensive Care Unit
IPC	Infection Prevention and Control
IPC SWG	Provincial Infection Prevention and Control Surveillance Working Group
PHSA	Provincial Health Services Authority
PICNet	Provincial Infection Control Network of British Columbia
PIPSC	Provincial Infection Prevention and Control Steering Committee
SSC	Surveillance Steering Committee

Background

Clostridioides difficile (*C. difficile*) infections (CDI) are the most common cause of healthcare-associated infections in hospitals and have been associated with increased healthcare costs, prolonged hospitalization, and patient morbidity and mortality.^{1,2} The clinical presentation of CDI ranges from asymptomatic carriage to mild or moderate diarrhea, to toxic megacolon, and even death. Among Canadian Nosocomial Infection Surveillance Program (CNISP) hospitals reporting CDI data (network total: 109 sentinel sites, 10 provinces, 1 territory), 4,818 cases were reported in 2024, with an overall 30-day all-cause mortality of 8.0%.³

Partner collaboration commenced in 2006 for a provincial *Clostridium difficile*-associated disease (CDAD) surveillance program that was launched in 2008 by the Provincial Infection Control Network of BC (PICNet), in collaboration with each health authority (HA) and the Ministry of Health (MoH). A corresponding protocol was also developed to facilitate standardized case definitions, data collection and reporting of the incidence of CDAD in hospital settings across the province. Since then, the protocol has transitioned from CDAD to CDI to align with current nomenclature, and is reviewed regularly to ensure consistency with accepted provincial and national definitions and to conform with advancements in best practices. This updated protocol provides guidance for collecting and reporting CDI surveillance data in BC acute care facilities. Any modifications or changes in applying this protocol should be communicated with PICNet in advance to facilitate data analysis and interpretation.

Objectives

CDI surveillance protocol objectives include:

- Identifying the population under surveillance
- Developing standardized CDI case definition and classification categories
- Identifying data submission requirements

CDI surveillance program objectives include:

- Determining the rate of healthcare-associated CDI in BC acute care facilities
- Monitoring provincial CDI trends and patterns
- Assessing disease burden, including relapse rates and complications (ICU admission, toxic megacolon, colectomy)

Population Under Surveillance

The population under CDI surveillance includes inpatients aged one year or older and admitted to acute care facilities* in BC.

INCLUDES:

- Patients seen in outpatient clinics or emergency departments who are subsequently admitted to an acute care inpatient ward

EXCLUDES:

- Patients seen in outpatient clinics in the acute care facility who are not subsequently admitted
- Patients seen in emergency departments who are not admitted
- Individuals in extended care beds (long-term care) or in mental health beds housed in the acute care facilities
- Inpatients less than one year old. (Note: *Infants under one year of age are not under surveillance, as they have high rates of asymptomatic colonization.*)^{4,5,6}

Note:

If mental health inpatients are included in your health authority's CDI surveillance population, include both CDI cases and inpatient days for these patients in the data submission. Where possible, exclude inpatient days for patients <1 year old from the denominator.

* **Acute care facility:** A hospital and an inpatient setting providing necessary treatment for a disease or episode of illness for a short period of time (e.g., where length of stay averages < 30 days). These can include settings with surgical, medical, intensive care, and/or rehabilitation units.⁷

Case Definition

1. Clinical evidence AND Laboratory Confirmation

Clinical criteria:

- Diarrhea: Persistent passage of ≥ 3 liquid or loose stools in 24 hours and this is new or unusual for the patient, or ≥ 6 liquid or loose stools in 36 hours (Bristol Stool Scale Type 6 or 7)⁸

Notes:

1. *Diarrhea must occur within the 7-day infection window, defined as the specimen collection date ± 3 days.*
2. *Consideration for other etiologies/contributors to loose stools, such as use of laxative, new medications with GI side effects, or other chronic gastrointestinal causes of diarrhea, should be included in determining if the patient meets the clinical criteria above.*
3. *If documentation on stool frequency and consistency is unavailable, or only one or two loose/liquid stools are recorded, the infection control practitioner (ICP) should apply clinical judgment, including potential alternate causes.*

OR

- Toxic megacolon* in the absence of other known etiology (e.g., underlying medical conditions or medications).

Laboratory confirmation:

• Testing methods

- Detection of *C. difficile* toxin gene by Nucleic Acid Amplification Test (NAAT), such as single-target or multiplex gastrointestinal PCR panel
- Detection of glutamate dehydrogenase (GDH) antigen and *C. difficile* toxin A and/or B protein by toxin enzyme immunoassay (EIA)

Note: Laboratory testing approaches for CDI vary by site. For two-step testing, laboratories may use single-target CDI assays or multiplex gastrointestinal panels; the platform and sequence of testing may vary by site and may also

* **Toxic megacolon:** Abnormal dilation of the large intestine.

depend on admission timing. Some sites use EIA-only testing without NAAT in certain contexts. As a result, cases may be classified using both NAAT and EIA results or an EIA result alone, as outlined in the table below.

- **Case reporting determination:**

LABORATORY RESULT		REPORT AS A CDI CASE?
2-Step Testing	NAAT+ and EIA+	Yes, if all case definition criteria are met
	NAAT+ and EIA-	Yes, if all case-definition criteria are met
EIA-Only Testing	No NAAT performed and EIA+	Yes, if all case-definition criteria are met
	No NAAT+ performed and Indeterminate EIA (GDH+ and toxin-)	No, this should not be classified as a CDI case

Laboratory terminology⁹

- **NAAT positive (NAAT+):** Toxigenic *C. difficile* genetic material has been detected.
- **EIA positive (EIA+):** *C. difficile* toxin A and/or B has been detected.
- **EIA negative (EIA-):** *C. difficile* toxin A/B has not been detected.
- **Indeterminate EIA (GDH+/toxin-):** GDH antigen is detected, indicating the potential presence of *C. difficile*, but toxin A/B is not detected.

OR

2. Diagnosis of typical pseudo-membranous colitis on sigmoidoscopy or colonoscopy

OR

3. Histological/pathological diagnosis of CDI with or without diarrhea

Case Classification

A CDI case is classified as either health care-associated (HCA) or community-associated (CA) based on the symptom onset of CDI and the patient's health care encounter history in the previous 4 weeks.

Note: The date of specimen collection is used as a proxy for symptom onset of CDI. If the date of specimen collection is not available, the date of laboratory report or the date of diagnosis (whichever is earliest) can be used.

New CDI Case

- A CDI case without previous history of CDI

OR

- A CDI episode with a specimen collected more than 8 weeks after the previous episode's specimen collection date

CDI Relapse

- A CDI episode with a specimen collected 2–8 weeks after the previous episode's specimen collection date

Note: Episodes identified less than 2 weeks after a prior CDI are regarded as a continuation of the original case and are not reported separately.

Healthcare-associated (HCA)

- A CDI case identified ≥ 72 hours after admission to an acute care facility

OR

- A CDI case with symptom onset in the community or < 72 hours after admission to an acute care facility, in an individual with a ≥ 24 hour or overnight stay in a healthcare facility (acute or long-term care) within the 4 weeks prior to symptom onset

HCA CDI cases are classified into 4 groups, based on the “New CDI Case” and “CDI Relapse” definitions above:

New CDI associated with the reporting facility

- A new CDI case (as defined above) with symptom onset ≥ 72 hours after admission to the reporting facility

OR

- A new CDI case (as defined above) with symptom onset occurring in the community or < 72 hours after admission to the reporting facility,

AND

- The patient was admitted to the reporting facility for a period of ≥ 24 hours, or at minimum an overnight stay, with a discharge date in the 4 weeks prior to the current hospitalization,

AND

- Symptom onset was within 4 weeks of the last discharge date from the reporting facility

New CDI associated with another healthcare facility

- A new CDI case (as defined above) with symptom onset occurring in the community or < 72 hours after admission to the reporting facility

AND

- The patient was admitted to another healthcare facility (including acute care and long-term care) for a period of ≥ 24 hours, or at minimum an overnight stay, with a discharge date in the 4 weeks prior to the current hospitalization

AND

The symptom onset was less than 4 weeks after the last discharge date from another facility

Note: If the patient had multiple encounters with different healthcare facilities (i.e. ≥ 24 hours or at minimum an overnight stay) in the past 4 weeks, the attribution of case classification can be judged by the risk assessment of the encounters or based on the most recent healthcare encounter.

Relapse of CDI associated with the reporting facility

- A relapse of CDI (as defined as above) following a previous CDI episode that was classified as associated with the reporting facility (as defined above)

Relapse of CDI associated with another healthcare facility

- A relapse of CDI (as defined as above) following a previous CDI episode that was classified as associated with another facility (as defined above)

Community-associated (CA)

- A CDI case with symptom onset in the community or < 72 hours after admission to an acute care facility, provided that the individual was not admitted to any healthcare facility (including acute care and long-term care) for a period of ≥ 24 hours, or at minimum an overnight stay, with a discharge date in the past 4 weeks before onset of CDI symptoms

Complications of CDI

Any patient with CDI will be followed up for 30 days after CDI diagnosis or up until the patient is discharged or transferred to evaluate whether the patient was admitted to an intensive care unit (ICU), or developed toxic megacolon, or required total or partial colectomy due to CDI. Only report these complications if they are associated with CDI.

ICU admission due to CDI

- Admitted to ICU due to the CDI episode or complications that were associated with CDI
EXCLUDES:
 - Patients who developed CDI while in ICU
 - Patients who were admitted to ICU due to other medical conditions that were not related to CDI

Toxic megacolon*

- Physician diagnosis of toxic megacolon due to CDI

Total or partial colectomy

- Documented evidence of surgical removal of part or all of the colon due to CDI

Data Collection and Submission

Case Data

The variables outlined in [Appendix A](#) should be collected and reported for each acute care facility by fiscal (or calendar) quarter.

The complications outlined in [Appendix A](#) should be reported as health authority-level aggregates across all acute care facilities within the health authority by fiscal (or calendar) quarter.

Denominator Data

The following denominator data is collected from each acute care facility as outlined in [Appendix B](#):

- Acute care bed count category (≤ 50 , 51-150, 151-250, and >250 beds), reported annually at fiscal year-end
- Total number of acute care admissions, reported quarterly
- Total number of inpatient days, reported quarterly

* **Toxic megacolon:** Abnormal dilation of the large intestine.

Data Analysis and Dissemination

PICNet will merge and analyze the quarterly data submitted from each HA, to generate the following metrics:

Quarterly

(publicly reported on PICNet website, submitted to MoH)

- Provincial rate of new CDI cases associated with the reporting facility, by fiscal year and quarter
- Provincial distribution (%) of CDI episodes reported in acute care facilities, by classification
- Rate of new CDI cases associated with the reporting facility, by health authority

Annually

(publicly reported on PICNet website)

- Distribution of CDI episodes reported in acute care facilities in BC, by classification
- Rate of new CDI cases associated with the reporting facility in BC, by health authority
- Provincial rate of new CDI cases associated with the reporting facility, by type of acute care facility
- Provincial rate of new CDI cases associated with the reporting facility, by size of acute care facility
- Number and percentage of relapses among HCA CDI cases
- CDI-associated complications within 30 days of diagnosis

Reports are sent to the Provincial IPC SWG and PIPSC members for review and approval, then to the Ministry of Health for approval for public release.

(<https://picnet.ca/surveillance/surveillance-reports/>).

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Appendix A. Aggregate CDI Data Submission Form

Health Authority:

Reporting period:

a) Number of CDI cases by classification and facility

Name of acute care facility	Healthcare-associated					Community-associated	Unknown/Unable to Determine	Total
	New CDI associated with the reporting facility	New CDI associated with another healthcare facility	Relapse of CDI associated with the reporting facility	Relapse of CDI associated with another healthcare facility	Total Healthcare-associated			
Total								

b) 30-days complications and outcomes
(aggregated at HA-level)

Complications	Number of Cases
ICU Admission	
Toxic Megacolon	
Total or Partial colectomy	

Appendix B. CDI Denominator Data Submission Form

Health Authority:

Reporting period:

Name of facility	Category of acute care beds per fiscal/calendar year	Total number of acute care admissions per fiscal/calendar quarter	Total number of acute care inpatient days per fiscal/calendar quarter
Total			