PICNet
PROVINCIAL INFECTION CONTROL NETWORK OF BRITISH COLUMBIA
A program of the Provincial Health Services Authority

Surveillance Protocol for *Clostridium difficile* Infections (CDI) in BC Acute Care Facilities

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Contacts:

Guanghong Han, *PhD*
Surveillance Epidemiologist
BC Provincial Infection Control Network
1001 West Broadway, Suite 504,
Vancouver, BC V6H 4B1
Tel: 604-875-4844 ext 22983
Fax: 604-875-4373
Email: guanghong.han@phsa.ca

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Introduction

Clostridium difficile infections (CDI) are the most common cause of healthcare-associated infections in hospitals and has 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.

Since 2006, the Provincial Infection Control Network of BC (PICNet), in collaboration with each health authority (HA), has developed a provincial surveillance programme to monitor the incidence of CDI in hospital settings across the province. A provincial protocol for CDI surveillance was developed by PICNet's Surveillance Steering Committee (SSC) (see appendix A) to standardize case definitions, data collection and reporting. The protocol is reviewed annually to ensure consistency with national and international accepted definitions and to reflect scientific advances in CDI prevention and control. This updated protocol provides guidance for collecting and reporting CDI surveillance data in BC acute care facilities from April 2019 onwards. Any modifications or changes in applying this protocol should be communicated with PICNet in advance to facilitate data analysis and interpretation.

Objectives

The objectives of the provincial CDI surveillance program are to:

- determine the rate of healthcare-associated CDI in BC acute care facilities
- monitor the trends and patterns of CDI in the province
- provide provincial information to assist in improving and evaluating CDI infection prevention and control programs

[1] Ofosu A. Annals of Gastroenterology 2016; 29, 147-154
[2] Martin JSH, Monaghan TM, and Wilcox MK. Nature Reviews. Gastroenterology & Hepatology 2016; 13:206-216

Population under surveillance

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

INCLUDES:

- patients admitted to the emergency department awaiting placement (e.g. patients admitted to a service who are waiting for a bed)
- patients in alternative level of care beds
- patients in labour and delivery beds

EXCLUDES:

- outpatient visits to the clinics in the acute care facility
- emergency room patients who were not admitted to an acute care inpatient ward
- patients in extended care beds or in mental health beds housed in the acute care facilities
- inpatients less than one year old

Note: In the case that mental health inpatients are NOT excluded from the population under surveillance for CDI in your health authority, the cases of CDI identified among mental health inpatients should be collected and included in your CDI data submission.

Case definition

A case of CDI is defined as:

- presence of diarrhea or toxic megacolon without other known etiology (e.g. from other underlying medical conditions or medications), AND laboratory confirmation of the presence of *C. Difficile* toxin A and/or B (positive toxin, or culture with evidence of toxin production, or detection of toxin genes)

  OR

- diagnosis of typical pseudo-membranous colitis on sigmoidoscopy or colonoscopy

  OR

- histological/pathological diagnosis of CDI with or without diarrhea

  Note:

  1) *Diarrhea is defined as persistent liquid or loose stools (e.g. passing liquid or loose stools three or more times per day for more than 24 hours), or more frequently than is normal for the patient.*
  2) *It is assumed that any stool sent to the laboratory for C. difficile testing is from a patient that has had at least three episodes of loose stools in a 24-hour period. It is accepted that some patients may have had only one or two loose stools prior to a specimen being collected, though this may overestimate the number of CDI cases.*
  3) *If the patient's medical chart was reviewed and the information about the frequency and consistency of diarrhea was not available, or only one or two liquid or loose stools was documented, the infection control practitioner (ICP) should make judgement based on the patient's other clinical manifestations and treatments, or consult with the nurse or physician caring for the patient.*

INCLUDES:

- CDI cases identified among the inpatients during their hospitalization in the reporting facility
- CDI cases identified at the time of admission to the reporting facility
- CDI cases identified at an outpatient clinic or emergency department and subsequently admitted to the reporting facility with CDI-related symptoms at the time of admission

EXCLUDES:

- CDI cases identified among outpatients or among patients from the emergency department who were not admitted to the reporting facility
- CDI cases identified among patients in extended care beds or mental health beds housed in the reporting facilities
- Patients transferred from another acute care facility with a known diagnosis of CDI
- *C. Difficile* identified among inpatients under one year of age

  Note: If the cases of CDI identified among mental health inpatients are NOT excluded, total inpatients days for mental health patients should be INCLUDED in the denominator.

Both new cases and relapses of CDI are under surveillance.

- **New case of CDI**
  - A CDI case without previous history of CDI

  OR
  - A CDI case that has not had an episode of CDI in the last 8 weeks
- **Relapse of CDI**

  The episode of CDI reoccurred between 2 and 8 weeks after a previous CDI case

  Note:

  1) *The period of 2-8 weeks can be calculated from the date of specimen collection or identification of previous CDI to the date of recurrence of CDI episode. Only the CDI identified within 2-8 weeks after the previous one is defined as a relapse of CDI.*

  2) Recurrence of CDI episode within 2 weeks from previous CDI is considered a continuation of the previous CDI. If the CDI is identified more than 8 weeks after the previous one, it will be considered as a new case.

  3) Communicate to PICNet if the symptom resolution is required when calculating the 2-8 weeks, i.e., symptom-free period for 2-8 weeks after the previous CDI.

Case classification

A CDI case is classified as either healthcare-associated (HCA) or community-associated (CA) based on the symptom onset of CDI and the patient's healthcare encounter history in the last 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 comes the earliest) can be used.

- **Healthcare-associated (HCA)**
  - A CDI case occurring > 72 hours or > 3 calendar days (the day of admission counted as the first calendar day, the same hereinafter) after admission to an acute care facility (e.g., the CDI

cases identified on or after the 4th calendar day of hospitalization will be classified as HCA)

OR

- A CDI case with symptom onset in the community or occurring ≤ 72 hours or ≤ 3 calendar days after admission to an acute care facility, provided that the patient was admitted to a healthcare facility (including acute care and long-term care) for a period of ≥ 24 hours or at least overnight stay in the past 4 weeks before onset of CDI symptoms

- **Community-associated (CA)**

  A CDI case with symptom onset in the community or occurring within ≤ 72 hours or ≤ 3 calendar days after admission to an acute care facility, provided that the patient was not admitted to any healthcare facility (including acute care and long-term care) for a period of ≥ 24 hours or at least overnight stay in the past 4 weeks before onset of CDI symptoms

- **Unknown**

  A CDI case where there is not enough information to assess whether the patient had a healthcare encounter in the past 4 weeks before onset of CDI symptoms

For the cases of HCA CDI, they are further classified into 4 groups:

- **New CDI associated with the reporting facility**
  - A new CDI case (as defined above) with symptom onset > 72 hours or > 3 calendar days after admission to the reporting facility

  OR

  - A new CDI case (as defined above) with symptom onset in the community or occurring ≤ 72 hours or ≤ 3 calendar days after admission to the reporting facility, AND

    The patient was admitted to the reporting facility for a period of ≥ 24 hours or at least overnight stay in the past 4 weeks before current hospitalization, AND

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

- **New CDI associated with another healthcare facility**
  - A new CDI case (as defined above) with symptom onset in the community or occurring ≤ 72 hours or ≤ 3 calendar days 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 least overnight stay in the past 4 weeks before current hospitalization

  AND

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

  Note: If the patient had multiple encounters with different healthcare facilities (i.e. at least overnight or ≥ 24 hours 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) from the previous CDI 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) from the previous CDI that was classified as associated with another facility (as defined above).

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 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:** admitted to ICU due to CDI episode or the 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, e.g., abnormal dilation of the large intestine documented radiologically. EXCLUDE toxic megacolon caused by other pathogens.
- **Total or partial colectomy:** documented evidence of surgical removal of part or the entire colon due to CDI. EXCLUDE colectomy that was due to other medical reasons.

Data collection and submission

The following information of CDI cases and denominators was determined by the SSC as a minimum dataset for the provincial CDI surveillance.

- **Core data elements for CDI cases**

  The following variables should be collected for each CDI case.
  - Case ID #
  - Date of admission
  - Name of reporting facility
  - Date of specimen collection (or diagnosis)
  - Classification
    - Healthcare-associated
    - Community-associated
    - Unknown

    If healthcare-associated:
    - 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
  - CDI-associated complications within 30 days of diagnosis

  - ICU admission
  - Toxic megacolon
  - Total or partial colectomy

- **Denominator data**

  The following data should be collected from each acute care facility by fiscal quarter (or calendar quarter) as denominators for CDI measurement:

  - Average count of acute care beds per quarter
  - Total number of acute care admissions
  - Total number of inpatient days

- **Data submission**

  After the end of each fiscal quarter, each HA will aggregate the cases of CDI at the facility level (see Appendix B), then submit these data to PICNet along with the denominator data (see Appendix C), via email by due date. At the end of each fiscal year, PICNet will verify the quarterly submitted data with each HA.

Data analysis and dissemination

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

- Total number of CDI cases by fiscal quarter and year
- Proportion of CDI by classification and HA
- Provincial rate of new CDI associated with reporting facility by fiscal quarter and year
- Rate of new CDI associated with reporting facility by HA
- Rate of new CDI associated with reporting facility by facility type
- Rate of new CDI associated with reporting facility by facility
- Percentage of complications among healthcare-associated CDI

The quarterly results will be summarized in the tables and graphs as the quarterly CDI surveillance report. An annual CDI surveillance report will be developed at the end of each fiscal year. All reports will be sent to the SSC members/HA for review, then to the Ministry of Health for approval for public release. Once approved, the reports will be posted at PICNet's website (www.picnet.ca). As required, the data will also be posted at the SharePoint of Ministry of Health each quarter.

Appendices

- Appendix A. Surveillance Steering Committee
- Appendix B. CDI Cases Data Submission Form
- Appendix C. CDI Denominators Data Submission Form

Appendix A. Surveillance Steering Committee

PICNet's Surveillance Steering Committee (SSC) consists of representatives from each health authority, related professional societies, and PICNet Management Office. SSC provides guidance to the provincial surveillance programs regarding healthcare-associated infections and assists the PICNet Management Office in implementation within the participating Health Authorities. The current members of the committee include:

- Joanne Archer
  Acting Network Director, Provincial Infection Control Network of British Columbia
- Dr. Elizabeth Brodkin
  Medical Health Officer and Executive Medical Director, Infection Prevention and Control, Fraser Health
- Alison Chant
  Infection Control Coordinator, Provincial Health Services Authority
- Jun Chen Collet
  Epidemiologist, Infection Prevention and Control, Provincial Health Services Authority
- Dr. Randall Dumont
  Pathologist, Northern Health
- Aleksandra Gara
  Regional Epidemiologist, Quality, Patient Safety & Infection Control, Vancouver Coastal Health
- Dr. Dave Goldfarb
  Medical Microbiologist, Provincial Health Services Authority
- Dr. Guanghong Han
  Epidemiologist, Provincial Infection Control Network of British Columbia (PICNet)
- Lisa Harris
  Infection Control Practitioner, Vancouver Coastal Health
- Deanna Hembroff
  Regional Manager, Infection Prevention & Control, Northern Health
- Dr. Linda Hoang
  Medical Microbiologist, BC Center for Disease Control and Co-Medical Director, Provincial Infection Control Network of British Columbia
- Dillon Kelly
  Infection Control Practitioner, Interior Health
- Dr. Pamela Kibsey
  Medical Microbiologist, Island Health
- Dr. Christopher Lowe
  Medical Microbiologist, Providence Health Care
- Dr. Neil Mina
  Medical Microbiologist, Fraser Health
- Dr. Julie Mori
  Epidemiologist, Infection Prevention and Control, Interior Health
- Blair Ranns
  Epidemiologist, Infection Prevention and Control, Island Health
- Azra Sharma
  Epidemiologist, Infection Prevention and Control, Providence Health Care
- Katy Short
  Senior Epidemiologist, Infection Prevention and Control, Fraser Health
- Dr. Bing Wang
  Medical Microbiologist, Interior Health
- Xuetao (Katherine) Wang
  Epidemiologist, Infection Prevention and Control, Fraser Health
- Dr. Titus Wong
  Medical Microbiologist, Vancouver Coastal Health
- Valerie Wood
  Director, Infection Prevention and Control, Interior Health

Appendix B. CDI Cases 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**	**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

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

Appendix C. CDI Denominator Data Submission Form

Health Authority:

Reporting period:

Name of facility	Number of acute care beds	Total number of acute care admissions	Total number of acute care inpatient days
Total			