

Ontario Public Health Standards:
Requirements for Programs, Services and Accountability

Infectious Disease Protocol

Appendix 1:

Case Definitions and Disease-Specific Information

Disease: Cyclosporiasis

Effective: May 2022

Cyclosporiasis

Communicable

Virulent

[Health Protection and Promotion Act \(HPPA\)](#)

[Ontario Regulation \(O. Reg.\) 135/18 \(Designation of Diseases\)](#)

Provincial Reporting Requirements

Confirmed case

Probable case

As per Requirement #3 of the "Reporting of Infectious Diseases" section of the *Infectious Diseases Protocol, 2018* (or as current), the minimum data elements to be reported for each case are specified in the following:

- [O. Reg. 569](#) (Reports) under the HPPA;⁵
- The iPHIS User Guides published by Public Health Ontario (PHO); and
- Bulletins and directives issued by PHO.

Type of Surveillance

Case-by-case

Case Definition

Confirmed Case

Laboratory confirmation of infection, with or without clinically compatible signs and symptoms, from an appropriate clinical specimen (e.g., stool, duodenal/jejunal aspirate, small bowel biopsy):

- Demonstration of *Cyclospora cayetanensis* (*C. cayetanensis*) oocysts (by

morphologic criteria) or *Cyclospora* deoxyribonucleic acid (DNA), by polymerase chain reaction (PCR)

Probable Case

Clinical illness in a person who is epidemiologically linked to a confirmed case.

Outbreak Case Definition

The outbreak case definition varies with the outbreak under investigation. Please refer to the *Infectious Diseases Protocol, 2018* (or as current) for guidance in developing an outbreak case definition as needed.

The outbreak case definitions are established to reflect the disease and circumstances of the outbreak under investigation. The outbreak case definitions should be developed for each individual outbreak based on its characteristics, reviewed during the course of the outbreak, and modified, if necessary, to ensure that the majority of cases are captured by the definition. The case definitions should be created in consideration of the outbreak definitions.

Outbreak cases may be classified by levels of probability (*i.e.* confirmed and/or probable).

Clinical Information

Clinical Evidence

Clinical illness is characterized by watery diarrhea, loss of appetite, weight loss, abdominal bloating and cramping, increased flatulence, nausea, fatigue, and low-grade fever. Vomiting may also be noted. Relapses and asymptomatic infections can occur. Some evidence suggests that symptoms may be more severe and long-lasting in immunocompromised individuals.

Clinical Presentation

Watery diarrhea is the most common symptom and can be profuse and protracted. Anorexia, nausea, vomiting, substantial weight loss, flatulence, abdominal cramping, myalgia, and prolonged fatigue also can occur. Fever is rare. Infection usually is self-

limited, but untreated people may have remitting, relapsing symptoms for weeks to months.¹ Individuals who are not treated may develop chronic complications including Guillain-Barré syndrome or Reiter's syndrome.² Biliary tract disease also has been reported.¹

Asymptomatic infection has been documented most commonly in settings where cyclosporiasis is endemic.¹

Laboratory Evidence

Laboratory Confirmation

The following will constitute a confirmed case of Cyclosporiasis:

- Microscopic demonstration of *C. cayetanensis* oocysts.

Approved/Validated Tests

- Microscopy
- PCR

Indications and Limitations

Not applicable

For further information about human diagnostic testing, contact the [Public Health Ontario Laboratories](#).

Case Management

In addition to the requirements set out in the Requirement #2 of the "Management of Infectious Diseases – Sporadic Cases" and "Investigation and Management of Infectious Diseases Outbreaks" sections of the *Infectious Diseases Protocol, 2018* (or as current), the board of health shall investigate cases of cyclosporiasis to determine the source of infection. Refer to Provincial Reporting Requirements above for relevant data to be collected during case investigation.

The disease is not endemic in Canada; therefore, cases should be investigated as

most likely associated with imported food or travel.

Treatment is under the direction of the attending health care provider.

Provide education on hand hygiene, proper food handling practices and on preventing the spread of infection.

Exclusion Criteria:

- Exclude symptomatic food handlers, healthcare providers,¹ and day care staff and attendees until symptom free for 24 hours, OR symptom free for 48 hours after discontinuing use of anti-diarrheal medication.

The rationale for exclusion for 48 hours after discontinuing the use of **anti-diarrheal** medication is to ensure that diarrhea does not return after the anti-diarrheal medication has been discontinued. In the event that **antibiotics** are used, the person should be excluded until symptom free for 24 hours.

Note: Treatment recommendations are under the direction of the attending health care provider.

Contact Management

Exclude symptomatic persons epidemiologically linked to the same potential source of *Cyclospora* from food handling as per the exclusion specified above for cases.

Outbreak Management

Please see the *Infectious Diseases Protocol, 2018* (or as current) for the public health management of outbreaks or clusters in order to identify the source of illness,

¹ If the healthcare setting is a hospital, use the "[Enteric Diseases Surveillance Protocol for Ontario Hospitals](#)" (OHA and OMA Joint Communicable Diseases Surveillance Protocols Committee, 2017, or as current) for exclusion criteria.

manage the outbreak and limit secondary spread.

Two or more cases linked by time, common exposure, and/or place is suggestive of an outbreak.

Refer to Ontario's Foodborne Illness [Outbreak Response Protocol \(ON-FIORP\) 2020 \(or as current\)](#) for multi-jurisdictional foodborne outbreaks which require the response of more than two Partners (as defined in ON-FIORP) to carry out an investigation.

Prevention and Control Measures

Personal Prevention Measures

Prevention measures are similar to those for other enteric diseases.

- Wash hands after using sanitary facilities and before handling food
- Produce should be washed thoroughly before it is eaten, although this practice does not eliminate the risk of cyclosporiasis.²
- Thoroughly cooking or baking fruits and vegetables will eliminate the risk of infection.³
- Travelers, especially to developing countries, should avoid any fruits and vegetables that cannot be peeled or cooked and should drink water from a safe (treated or boiled) source.³

Infection Prevention and Control Strategies

Disseminate general public health education messages about hand hygiene and safe food handling.

Routine practices are recommended for hospitalized cases.

Refer to [PHO's website](#) to search for the most up-to-date information on Infection Prevention and Control (IPAC).

Disease Characteristics

Aetiologic Agent - *Cyclospora cayetanensis* (*C. cayetanensis*) is a sporulating coccidian protozoan; oocysts (rather than cysts) are passed in stools and become infectious days to weeks following excretion.¹

Modes of Transmission - Both foodborne and waterborne outbreaks have been reported. Most of the outbreaks in the United States and Canada have been associated with consumption of imported fresh produce.¹ Imported fresh fruits and vegetables, including basil, cilantro, raspberries, blackberries, mesclun lettuce, snow and snap peas, and pre-packaged salad mixes have been linked as sources of *Cyclospora* infection in Canada. *Cyclospora* is not naturally found in or on fresh fruits and vegetables, or any other foods. However, it is suspected that food contamination occurs during cultivation, harvest, packaging or transportation through contact with contaminated water or infected workers.³

Direct person-to-person transmission is unlikely, as excreted oocysts take days to weeks under favorable environmental conditions to sporulate and become infective. The oocysts are resistant to most disinfectants used in food and water processing and can remain viable for prolonged periods in cool, moist environments.¹

Incubation Period – Incubation period is approximately 7 days and ranges from 2 to 14 days.¹

Period of Communicability - Direct person-to-person transmission is unlikely. Low-level shedding of oocysts is common, even in persons who are symptomatic.⁴ Excreted oocysts take days to weeks under favorable environmental conditions to sporulate and become infective.¹

Reservoir - Humans are the only known hosts for *C. cayetanensis*.¹

Host Susceptibility and Resistance - Immunocompromised individuals appear more susceptible to infection; diarrhea can last for months in some patients.² If you have already had cyclosporiasis, you can get it after recovery if you are exposed to the parasite again.³

Please refer to [PHO's Reportable Disease Trends in Ontario reporting tool](#) for the

most up-to-date information on infectious disease trends in Ontario.

For additional national and international epidemiological information, please refer to the Public Health Agency of Canada and the World Health Organization.

Comments

This disease is not endemic in Canada, therefore should be investigated as most likely associated with imported food or travel.

References

1. Committee on Infectious Diseases, American Academy of Pediatrics. Section 3: Summaries of Infectious Diseases: Cyclosporiasis. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. Red Book: 2018 Report of the Committee on Infectious Diseases. 31 ed. Itasca, IL: American Academy of Pediatrics; 2018.
2. Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.
3. Government of Canada. Cyclosporiasis (Cyclospora) [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2017 [updated June 29, 2017; cited February 13, 2018]. Available from: <https://www.canada.ca/en/public-health/services/diseases/cyclosporiasis-cyclospora.html>
4. Centers for Disease Control and Prevention. Parasites - Cyclosporiasis (Cyclospora Infection): Resources for Health Professionals [Internet]. Atlanta, GA: U.S. Department of Health & Human Services 2018 [updated May 22, 2018; cited June 29, 2018]. Available from: https://www.cdc.gov/parasites/cyclosporiasis/health_professionals/index.html
5. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: <https://www.ontario.ca/laws/regulation/900569>

Case Definition Sources

Acha P, Szyfres B. Zoonoses and Communicable Diseases Common to Man and Animals. Vol. 3. 3 ed. Washington, DC: Pan American Health Organization; 2003.

Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.

Public Health Agency of Canada. Cyclosporiasis. In: Case Definitions for Communicable Diseases under National Surveillance. Canada Communicable Disease Report. 2009;35S2.

Document History

Revision Date	Document Section	Description of Revisions
April 2022	Entire Document	New template. Appendix A and B merged. No material content changes.
April 2022	Epidemiology: Occurrence section	Removed.
April 2022	ICD Codes	Removed.