

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

Infectious Disease Protocol

Appendix 1:

Case Definitions and Disease-Specific Information

Disease: Cryptosporidiosis

Effective: May 2022

Cryptosporidiosis

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;⁸
- 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, intestinal fluid, small bowel biopsy):

- Demonstration of *Cryptosporidium* oocysts;

OR

- Detection of *Cryptosporidium* deoxyribonucleic acid (DNA);

OR

- Demonstration of *Cryptosporidium* antigen by an approved method (e.g., enzyme immunoassay [EIA], immunochromatographic test [ICT]).

Probable Case

Clinically compatible signs and symptoms in a person with an epidemiologic link to a laboratory-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

Clinically compatible signs and symptoms are characterized by diarrhea (often profuse and watery), abdominal cramps, anorexia, fever, nausea, general malaise, and vomiting.

Clinical Presentation

Cryptosporidiosis is a parasitic infection that commonly presents as gastroenteritis. The major symptom is diarrhea, which may be watery and profuse and is associated

with cramping and abdominal pain. In children, the diarrhea is often preceded by anorexia and vomiting. General malaise, fever, anorexia, nausea and vomiting occur less often. Symptoms often wax and wane but remit in less than 30 days in most immunologically healthy people. Asymptomatic infections are common and constitute a source of infection for others.^{2,6}

Cryptosporidiosis in immunocompromised individuals may lead to more severe clinical manifestations such as pancreatitis and liver cirrhosis.⁴

In immunocompromised persons, especially those infected with HIV, who may be unable to clear the parasite, the disease has a prolonged and fulminant clinical course contributing to death. Patients with AIDS who have cryptosporidiosis have a wide spectrum of disease depending on the site of infection and the CD4+ T-cell count. Among the immunocompromised (e.g., those who are HIV positive or have AIDS), symptoms can also relapse.^{5,6}

Laboratory Evidence

Laboratory Confirmation

Any of the following will constitute a confirmed case of Cryptosporidiosis:

- Positive for *Cryptosporidium* oocysts;
- Positive for *Cryptosporidium* DNA; or
- Positive for *Cryptosporidium* antigen.

Approved/Validated Tests

- Microscopy;
- Direct fluorescent antibody (DFA);
- Nucleic acid amplification test (NAAT) for *Cryptosporidium*; and
- *Cryptosporidium* immunoassays (EIA, ICT).

Indications and Limitations

- *Cryptosporidium* oocysts can be recovered from microscopic examination of concentrated material from fecal specimens, but it is difficult when the number of oocysts is low.
- Trichrome and iron haematoxylin stains are not the methods of choice. Auramine-rhodamine stains may be useful for screening.
- Presumptive identification should be confirmed by modified acid-fast stains (e.g., Safranin) or immunoassays.
- While *Cryptosporidium parvum* and *Cryptosporidium hominis* are the leading causes of cryptosporidiosis, other species are known to cause diarrheal illness in immunocompromised individuals.

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 to determine the source of infection. Refer to Provincial Reporting Requirements above for relevant data to be collected during case investigation.

Exclude food handlers, healthcare workers, daycare staff and attendees who are symptomatic until 24 hours after cessation of symptoms.²

Provide education about the illness and how to prevent spread, emphasizing strict hand hygiene.

There is no specific treatment except rehydration when indicated.²

Contact Management

Investigate household and close contacts who may have shared a common source exposure (e.g., water supply, food, etc.).

Symptomatic contacts that are food handlers, healthcare workers, daycare staff and attendees should be assessed by their healthcare provider to determine if infected and should be excluded as above.

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, manage the outbreak and limit secondary spread.

An outbreak is defined as the occurrence of two or more cases of enteric illness linked by time, common exposure, or source, and most often location.

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

Practice proper hand hygiene after using sanitary facilities, toileting and diapering, handling pets/livestock and before and after handling food.

Consume Safe Drinking Water

Where water might be contaminated, travelers, campers and hikers should be advised of methods to make water safe for drinking.

- Water should be brought to a full boil for one minute.²
- Filters designed to remove *Cryptosporidium* oocysts should be used.⁹

- Oocysts are resistant to chlorine.¹

Recreational Water Use

- Avoid using public recreational waters such as swimming pools and splash pads for 2 weeks after symptoms have resolved.¹
- Babies and toddlers should wear special swim diapers or pants when using public recreational waters.

Food Safety

- Use potable water to wash or rinse fresh fruit and vegetables before consumption.¹⁰
- Thoroughly cook and reheat all food derived from animal sources to the appropriate temperatures. For temperatures, see the [ministry's Food Safety: Cook publication](#).
- Consume only pasteurized milk and dairy products.¹¹

Infection Prevention and Control Strategies

- A safe water supply is of primary importance.
- Educate the public about hand hygiene, washing produce, and the risks involved with sexual contact.
- Routine and contact practices are recommended for incontinent and/or diapered hospitalized/institutionalized cases.¹
- Increased public awareness of acceptable practices at swimming venues can help avoid acquiring or transmitting the disease.
- Recreational water operators should be effectively trained in procedures for the management of fecal accidents and in proper filtration methodology.¹²
- Where recreational water (e.g., pool, spa, hot tub, wave pool, splash pad, water park) is determined to be the confirmed or suspect source of cryptosporidiosis, boards of health should refer to the *Recreational Water Protocol, 2018* (or as current). Operators may be advised to take action, including, but not limited to, closing the premises to the public and performing hyperchlorination.¹³

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

Disease Characteristics

Aetiologic Agent - *Cryptosporidium* are oocyst-forming coccidian protozoa. Oocysts are excreted in feces of an infected host. The most common species causing disease in humans are *C. hominis*, which only infects humans, and *C. parvum*, which infects humans, cattle and other mammals.¹

Oocysts may survive for 2 to 6 months in a moist environment.² *Cryptosporidium* is resistant to most disinfectants including 3% hypochlorite, iodophors, and 5% formaldehyde and can survive for days in treated recreational water venues.^{3,4}

The infectious dose is low; studies have demonstrated that the ingestion of ≤ 10 *C. hominis* or *C. parvum* oocysts can cause infection in healthy persons.⁵

Modes of Transmission - Fecal-oral, which includes person-to-person, animal-to-person, waterborne (recreational or drinking water) and foodborne transmission.²

Incubation Period – Variable; 1 to 12 days is the likely range with an average of about 7 days.²

Period of Communicability - Oocysts, the infectious components of the parasites life cycle, appear in stool at the onset of symptoms and are infectious immediately upon excretion; duration of post-symptomatic oocyst excretion varies from several weeks to months.^{1,2} The duration of oocyst infectiousness in the environment under suitable soil conditions can range from 2 to 6 months.²

Symptoms can last for 30 days or less in healthy hosts, or longer in immunocompromised.² Mean duration has been reported as 12.7 days or up to a month in healthy adults, relapse/recurrence can occur after an asymptomatic period.^{5,8} Among the immunocompromised (e.g., those who are HIV positive or have AIDS), symptoms can be chronic/relapsing.^{5,6}

Reservoir - Humans, cattle and other domesticated and feral animals.²

Host Susceptibility and Resistance - Persons with intact immune function usually have asymptomatic or self-limiting illness. It has been estimated that 10 to 20% of AIDS patients develop infection at some time during their illness.²

Those who are particularly prone to infection include children under two, animal handlers, travelers, men who have sex with men and close personal contacts of infected individuals (family, healthcare and daycare workers).²

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.

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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.