



Health and
Wellness

Prince Edward Island Guidelines for the Management and Control of Cryptosporidiosis

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Department of Health and Wellness
Chief Public Health Office

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Cryptosporidiosis

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Cryptosporidiosis

Case Definition ¹

Confirmed Case

Laboratory confirmation of infection with or without clinical illness* from an appropriate clinical specimen (e.g., stool, intestinal fluid, small bowel biopsy): with demonstration of:

- *Cryptosporidium* spp. oocysts

OR

- *Cryptosporidium* spp. nucleic acid (e.g., by polymerase chain reaction (PCR) or other nucleic acid test (NAT))

OR

- *Cryptosporidium* spp. antigen (e.g., by an immunologic assay).

Probable Case

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

* Clinical illness may be characterized by the following signs or symptoms: Diarrhea (often profuse and watery), abdominal pain, anorexia, fever, nausea, general malaise, dehydration, and/or vomiting. The severity of illness may vary. While not considered clinical illness, asymptomatic infections may occur.

Reporting Requirements

Laboratories

The Provincial Laboratory shall in accordance with the Prince Edward Island *Public Health Act*², report all positive laboratory results by phone and mail, fax or electronic transfer as soon as the result is known to the Chief Public Health Officer (CPHO) (or designate).

^a Probable case definitions are provided as guidelines to assist with case finding and public health management and are not for national notification purposes.

Etiology^b

Cryptosporidium is an intracellular protozoan parasite. A ubiquitous pathogen, it is one of both medical and veterinary importance. *Cryptosporidium parvum* is the most prevalent species causing disease in humans. It is known to infect and reproduce in the epithelial cell lining of the digestive or respiratory tracts of most vertebrates. *C. parvum* is a spore forming parasite. The lifecycle is completed within a single host.

Clinical Presentation

Asymptomatic infections with *Cryptosporidium* are common and represent a source of infection for others. The major symptom is diarrhea, often profuse and watery, associated with abdominal cramping. Fever, malaise, anorexia, nausea, and vomiting occur but less often. The symptoms may come and go but, in general, abate within 30 days. In children, diarrhea may be preceded by anorexia and vomiting. Immunocompromised individuals may not be able to clear the parasite.

Diagnosis

Diagnosis is made through examination of stools, intestinal fluid or small bowel biopsy for oocysts or parasitic antigens. Detection of this organism is difficult unless it is looked for specifically. It may require more than one specimen as shedding of oocysts is intermittent.

Epidemiology³

1. Reservoir

Humans, cattle, and sheep are the principal reservoirs for *Cryptosporidium*. Other domestic animals including birds and reptiles, and occasionally wild animals are also reservoirs for this parasite. Fertilizing salad vegetables with manure is known to be a source of human infection.

2. Transmission

Transmission of *Cryptosporidium* is via the fecal-oral route including person to person, animal to person or environmental, especially waterborne, and foodborne. Transmission between sexual partners has been reported.

^b While *Cryptosporidium parvum* and *Cryptosporidium hominis* are the leading causes of cryptosporidiosis, other species are known to cause diarrheal illness in immunocompromised individuals. Untreated and unfixed (i.e., without formalin) clinical specimens are recommended for PCR and deoxyribonucleic acid (DNA) based methodologies including molecular diagnostic testing and downstream molecular surveillance approaches. Formalin-based fixatives used for microscopy can interfere with nucleic acid detection and sequencing.

Note: For molecular surveillance purposes, Cary Blair transport media is acceptable.

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The parasite infects the intestinal epithelial cells. The end result is oocysts in feces that are able to survive under adverse environmental conditions for a long period of time. The oocysts are highly resistant to chemical disinfectants used to purify drinking water. The mode of transmission of *Cryptosporidium* increases the risk of infection for those living in group settings, travellers to endemic areas, and immunocompromised persons. Fewer than 10 organisms can cause disease.

3. Incubation Period

The incubation period is not precisely known. It has been suggested that 1 to 12 days is the likely range with an average of 7 days.

4. Period of Communicability

Oocysts, the infectious stage of the parasite, appear at the onset of the symptoms and are infectious immediately upon excretion. The oocysts may be excreted in stool for weeks beyond the symptoms of the disease however, in most cases the shedding of *Cryptosporidium* stops within 2 weeks. These oocysts may remain infective outside the body for 2 to 6 months in a moist environment.

5. Host susceptibility

Universal susceptibility. Persons with intact immune functions usually have asymptomatic or self-limited infections. It has been estimated that 10 to 20% of AIDS patients develop *Cryptosporidium* infection at some time during their illness and the *Cryptosporidium* infection persists throughout.

Occurrence

1. General

Cryptosporidium is considered one of the most common enteric pathogens in humans and domestic animals worldwide. It affects all age groups. Children under six years of age, animal handlers, travellers, men having sex with men, and close personal contacts of infected individuals (families, healthcare, and daycare workers) are most likely to become infected. In developing countries, the prevalence ranges from 3 to 20%. The incidence is greatest in the summer and early fall (outdoor swimming season). Outbreaks in North America and Europe have been associated with contaminated drinking water, bathing in contaminated swimming pools, waterparks, and lakes, and drinking unpasteurized apple cider that had been contaminated with cow manure. The most notable outbreak occurred in 1993 in Wisconsin. More than 400,000 people were infected. The source was a contaminated water supply.

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2. Canada

In 2000, 613 cases (rate 2.62/100,000) were reported. The highest incidence was in children one to four years of age followed by children aged five to nine years. Recent outbreaks and cases in Canada have been associated with swimming in and drinking contaminated pool water.

3. Prince Edward Island

Approximately 5 cases of *Cryptosporidium* per year are reported in PEI, however that number can fluctuate.

Control

1. Management of a case

- All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.
- Exclusion should be considered for symptomatic persons who are:
 - food handlers whose work involves
 - touching unwrapped food to be consumed raw or without further cooking and/or
 - handling equipment or utensils that touch unwrapped food to be consumed raw or without further cooking,
 - healthcare, daycare, or other staff who have contact through serving food, with highly susceptible patients or persons, in whom an intestinal infection would have particularly serious consequences,
 - involved in patient care or care of young children, elderly, or dependent persons,
 - children attending daycares or similar facilities who are diapered or unable to implement good standards of personal hygiene, and
 - older children or adults who are unable to implement good standards of personal hygiene (e.g., mentally, or physically challenged).
- Exclusion applies until at least 48 hours after diarrhea has resolved.
- Asymptomatic individuals who are included in the above categories are generally not excluded from work or daycare. However, the decision to exclude will be made by the CPHO.
- Reassignment to a low-risk area may be used as an alternative to exclusion.
- When possible, people taking immunosuppressive therapy are advised to reduce or stop under the guidance of an infectious disease's physician.
- Contact precautions should be used in healthcare settings where children or adults have poor hygiene or incontinence that cannot be contained. Otherwise, routine practices are adequate.
- Public Health Nursing, Health PEI, will follow up all confirmed cases and environmental health officers may be consulted on cases as appropriate.

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2. Treatment of a case

- In most cases, cryptosporidiosis is a self-limited disease.
- There is no treatment of known value. For chronic cases, consultation with an infectious diseases physician who may consider experimental or unproven therapies is recommended.
- Rehydration and electrolyte replacement if indicated.

3. Management of contacts

- Contacts should be instructed in disease transmission, appropriate personal hygiene, routine practices, and contact precautions.
- Symptomatic contacts should be assessed by a physician.
- Contacts who are symptomatic may be excluded from daycare or similar facilities or occupations involving food handling, patient care or care of young, elderly, or dependent persons as per CPHO assessment.
- Asymptomatic contacts, in general, are not excluded from work or daycare.

4. Preventative measures

- Educate members of the public about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food.
- Provide education to food handlers about proper food and equipment handling and hygiene, and thorough hand washing.
- Advise infected individuals to avoid food preparation.
- Educate about the risk of sexual practices that permit fecal-oral contact.
- Test private water supplies for presence of contamination, if suspected.
- Encourage hand washing after any animal contact including pets, especially those in contact with calves and other animals with diarrhea.
- Advise infected individuals to not use public recreational water (e.g., pools, lakes, ponds) for two weeks after the symptoms resolve.

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References

1. Public Health Agency of Canada (2024 December). <https://www.canada.ca/en/public-health/services/diseases/cryptosporidiosis/health-professionals/national-case-definition.html>
2. Public Health Act of Prince Edward Island. Legislative Assembly of PEI. May 2022 https://www.princeedwardisland.ca/sites/default/files/legislation/p-30-1-public_health_act.pdf
3. Heymann, David L. 2015. *Control of Communicable Diseases Manual 20th Edition*. Washington : American Public Health Association, 2015.