

Appendix A: Disease-Specific Chapters

Chapter: Giardiasis

Effective: February 2019

Giardiasis

Communicable

Virulent

**Health Protection and Promotion Act:
O. Reg. 135/18 (Designation of Diseases)**

1.0 Aetiologic Agent

Giardiasis is caused by a flagellate protozoan, *Giardia lamblia* (also known as *G. intestinalis* or *G. duodenalis*).¹ The organism is found in two forms: a pear-shaped trophozoite and an ovoid cyst. The trophozoite is relatively fragile, and dies when excreted from the body. The cyst, which is environmentally hardy, is the infective form.²

2.0 Case Definition

2.1 Surveillance Case Definition

Refer to [Appendix B](#) for Case Definitions.

2.2 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).

3.0 Identification

3.1 Clinical Presentation

Symptoms may include acute, self-limiting diarrhea, or chronic diarrhea, steatorrhea, abdominal cramps, bloating, frequent loose and pale greasy stools, fatigue, and weight loss. There is usually no extra-intestinal invasion, but reactive arthritis and, in severe giardiasis, damage to duodenal and jejunal mucosal cells may occur. Persons may also be asymptomatic.¹

3.2 Diagnosis

See [Appendix B](#) for diagnostic criteria relevant to the Case Definitions.

For further information about human diagnostic testing, contact the Public Health Ontario Laboratories or refer to the Public Health Ontario Laboratory Services webpage: <http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/default.aspx>

4.0 Epidemiology

4.1 Occurrence

Worldwide. Children are infected more frequently than adults. Prevalence is higher in areas with poor sanitation and in institutions with children who are not toilet trained, including day care settings.¹ Endemic infection in the temperate zone most commonly occurs in July through October among children less than 5 and adults aged 25-39.¹

Infection is associated with drinking water from unfiltered surface water sources or shallow wells, swimming in bodies of freshwater, eating fecally contaminate food, and having a young family member in day care. Large community outbreaks have occurred from drinking treated but unfiltered water. Smaller outbreaks have resulted from contaminated food, person-to-person transmission in day care settings, and contaminated recreational waters (e.g., swimming and wading pools).¹

Between 2013 and 2017, an average of 1,314 cases of giardiasis was reported per year in Ontario.*

Please refer to Public Health Ontario's (PHO) Reportable Disease Trends in Ontario reporting tool and other reports for the most up-to-date information on infectious disease trends in Ontario.

<http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/DataReports.aspx>

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

4.2 Reservoir

Humans are the principal reservoir of infection, but *Giardia* organisms can infect dogs, cats, beavers, cattle, nonhuman primates, and other animals.^{1,2}

4.3 Modes of Transmission

Person-to-person transmission occurs by hand-to-mouth transfer of cysts from the feces of an infected individual, especially in institutions and day care settings; this is probably the principal mode of spread. Anal intercourse also facilitates transmission.¹

Localized outbreaks may occur from ingestion of cysts in fecally contaminated drinking and recreational water more often than from fecally contaminated food. Concentrations of chlorine used in routine water treatment do not kill *Giardia* cysts, especially when the water is cold; unfiltered stream and lake waters open to contamination by human and animal feces are a source of infection.¹

* Data included in the epidemiological summary are from January 1, 2013 to December 31, 2017. Data were extracted from Query on February 7, 2018 and therefore are considered preliminary.

4.4 Incubation Period

Usually 3 – 25 days or longer; median 7 – 10 days.¹

4.5 Period of Communicability

Duration of cyst excretion is variable but can range from weeks to months. Giardiasis is communicable for as long as the infected person excretes cysts.^{1,2}

4.6 Host Susceptibility and Resistance

Asymptomatic carrier rate is high; infection is frequently self-limited. Persons with HIV infection may have more serious and prolonged giardiasis.¹

5.0 Reporting Requirements

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:

- *Ontario Regulation 569* (Reports) under the *Health Protection and Promotion Act* (HPPA);³
- The iPHIS User Guides published by PHO; and
- Bulletins and directives issued by PHO.

6.0 Prevention and Control Measures

6.1 Personal Prevention Measures

Prevention Measures:

- Education of families and personnel of day care centres on personal hygienic practices, such as hand washing before meals, after toilet use and changing diapers.²
- Where water might be contaminated, travelers, campers and hikers should be advised of methods to make water safe for drinking, including boiling, chemical disinfection and filtration.²
- Waterborne disease can be prevented by combination of adequate filtration of water from surface water sources (e.g. lakes, rivers, and streams), chlorination, and maintenance of water distribution systems including private water supplies.²
- Regular testing of private water supplies is advisable.

6.2 Infection Prevention and Control Strategies

Routine practices are recommended for hospitalized cases.

Refer to PHO’s website at www.publichealthontario.ca to search for the most up-to-date information on Infection Prevention and Control.

6.3 Management of Cases

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 Section 5: Reporting Requirements above for relevant data to be collected during case investigation.

The following disease-specific information should also be obtained during the incubation period:

- History of out-of-province or international travel including earliest and latest exposure dates;
- History of exposure to known sources of *Giardia*;
- Residency/attendance or employment at a facility or institution.

People with diarrhea caused by *Giardia* species should not use recreational water venues such as swimming pools, lakes and rivers while symptomatic. Children who had diarrhea attributable to *Giardia* and who are incontinent should avoid recreational water activities for 1 week after symptoms resolve.²

Provide education about the illness, proper hand hygiene, proper food handling and how to prevent the spread of infection as above.

Exclusion Criteria:

- Exclude symptomatic food handlers, healthcare providers,[†] 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.

6.4 Management of Contacts

Household members and other suspected contacts should be assessed for symptoms and if symptomatic should be advised to seek medical care. Provide information about the spread of infection and how to prevent it. Management of symptomatic contacts is the same as for cases.

[†] 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, available at: <https://www.oha.com/labour-relations-and-human-resources/health-and-safety/communicable-diseases-surveillance-protocols>

6.5 Management of Outbreaks

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.

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) 2013 (or as current) for multi-jurisdictional foodborne outbreaks which require the response of more than two Parties (as defined in ON-FIORP) to carry out an investigation.

7.0 References

1. Heymann DL, editor. *Control of Communicable Diseases Manual*. 20 ed. Washington, D.C: American Public Health Association; 2015.
2. Committee on Infectious Diseases, American Academy of Pediatrics. Section 3: Summaries of Infectious Diseases: *Giardia intestinalis*. 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.
3. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: <https://www.ontario.ca/laws/regulation/900569>

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
December 2014	General	New template. Chapter title updated to delete "except asymptomatic cases". Title of Section 4.6 changed from "Susceptibility and Resistance" to "Host Susceptibility and Resistance". Title of Section 5.2 changed from "To Public Health Division (PHD)" to "To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry". Section 9.0 Document History added.

Revision Date	Document Section	Description of Revisions
December 2014	1.0 Aetiologic Agent	First sentence, “caused by the protozoa” replaced with “caused by a flagellate protozoan...” Fourth sentence, “...resistant, thrives in warm, still bodies of water such as ponds as stagnant lakes” replaced with “...hardy is also the infective form.”
December 2014	2.2 Outbreak Case Definition	Entire section revised.
December 2014	3.1 Clinical Presentation	Entire section revised.
December 2014	3.2 Diagnosis	Entire section revised.
December 2014	4.1 Occurrence	Entire section revised.
December 2014	4.2 Reservoir	“Humans, possibly beavers and other wild and domestic animals” replaced with “Humans are the principal reservoir of infection, but <i>Giardia</i> organisms can infect dogs, cats, beavers, rodents, sheep, cattle, nonhuman primates, and other animals.”
December 2014	4.3 Modes of Transmission	Entire section revised.
December 2014	4.5 Period of Communicability	Addition of “Duration of cyst excretion is variable but can range from weeks to months.” Second sentence changed from “The disease is communicable...” to “Giardiasis is communicable...”
December 2014	4.6 Host Susceptibility and Resistance	Entire section revised.
December 2014	5.1 To local Board of Health	“Confirmed and suspected cases shall be reported to” replaced with “Individuals who have or may have giardiasis shall be reported as soon as possible to”.

Revision Date	Document Section	Description of Revisions
December 2014	5.2 To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry	First paragraph, first sentence, “to PHD” deleted. Second bullet replaced. Third bullet, “issued by the Ministry” replaced with “issued by PHO”.
December 2014	6.1 Personal Prevention Measures	Addition of third bullet: “Waterborne disease can be prevented by...”
December 2014	6.2 Infection Prevention and Control Strategies	Addition of second paragraph which notes sources for reference.
December 2014	6.3 Management of Cases	Entire section revised.
December 2014	6.4 Management of Contacts	First sentence, addition of “and if symptomatic should be advised to seek medical care.” Third sentence replaced with “Management of symptomatic contacts is the same as for cases.”
December 2014	6.5 Management of Outbreaks	Entire section revised.
December 2014	7.0 References	All references updated.
December 2014	8.0 Additional Resources	All resources updated.
February 2019	General	Minor revisions were made to support the regulation change to Diseases of Public Health Significance. Common text included in all Disease Specific chapters: Surveillance Case Definition, Outbreak Case Definition, Diagnosis, Reporting Requirements, Management of Cases, and Management of Outbreaks. The epidemiology section and references were updated and Section 8.0 Additional Resources was deleted.

Revision Date	Document Section	Description of Revisions
February 2019	6.3 Management of Cases	<p>“Cases should not use recreational water venues such as swimming pools, lakes and rivers for 2 weeks after symptoms resolve” updated to “People with diarrhea caused by <i>Giardia</i> species should not use recreational water venues such as swimming pools, lakes and rivers while symptomatic. Children who had diarrhea attributable to <i>Giardia</i> and who are incontinent should avoid recreational water activities for 1 week after symptoms resolve”.</p>

