Giardiasis

Revision Dates

Case Definition	January 2018
Reporting Requirements	January 2018
Epidemiology/Public Health Management	January 2018

Case Definition

Confirmed Case

Laboratory confirmation of infection with or without clinical illness[(A)]:

- Microscopic detection of *Giardia* trophozoites and/or cysts in stool, duodenal fluid or duodenal/small bowel biopsy specimens,

OR

- Detection of *Giardia* antigen in stool by a *Giardia*-specific immunodiagnostic test (e.g., EIA),

OR

- Detection of *Giardia* nucleic acid (e.g., PCR) in an appropriate clinical specimen (e.g., stool, fluid or tissue).

Probable Case

Clinical illness[(A)] in a person who is epidemiologically linked to a confirmed case.

[(A)] Clinical illness: diarrhea, abdominal cramps, bloating, weight loss, fatigue or malabsorption.

Reporting Requirements

1. **Physicians, Health Practitioners and others**
   A physician, health practitioner or person in charge of an institution shall in accordance with Sections 22(1)(b) of the Public Health Act, notify the Medical Officer of Health (MOH) (or designate) of the zone, of all confirmed and probable cases in the prescribed form by mail, fax or electronic transfer within 48 hours (two business days).

2. **Laboratories**
   All laboratories shall report all positive laboratory results by mail, fax or electronic transfer within 48 hours (two business days) to the MOH (or designate) of the zone and the Chief Medical Officer of Health (CMOH) (or designate).

3. **Alberta Health Services and First Nations Inuit Health Branch**
   - The MOH (or designate) of the zone where the case currently resides shall forward the initial Notifiable Disease Report (NDR) of all confirmed and probable cases to the CMOH (or designate) within two weeks of notification and the final NDR (amendment) within four weeks of notification.
   - For out-of-province and out-of-country reports, the following information should be forwarded to the CMOH (or designate) by phone, fax or electronic transfer within 48 hours (two business days):
     - name,
     - date of birth,
     - out-of-province health care number,
     - out-of-province address and phone number,
     - positive laboratory report and
     - other relevant clinical/ epidemiological information.

Etiology

Giardia lamblia (also called *G. intestinalis, G. duodenalis* or beaver fever) is a parasite that infects the biliary tract and upper small intestine.[1] It exists in trophozoite (free living) form and cyst form.[2] The cyst is the infective form and is sporadically excreted in feces.

Clinical Presentation

The majority of giardiasis cases are asymptomatic, some of whom will spontaneously clear infection, others who will become cyst passers.[2–4] Approximately one-third of people may suffer from the acute onset of intermittent acute watery diarrhea, steatorrhea, abdominal cramps and distention, flatulence, and anorexia.[1] Weight loss can be a main clinical feature distinguishing a person with giardia infection from another infection.[2] Most infections resolve spontaneously within six weeks.[5]

Chronic giardiasis is characterized by profound malaise and weariness and gastrointestinal discomfort that is exacerbated by eating.[2] As the disease progresses the stool becomes greasy, foul-smelling, and may float. Periods of diarrhea may alternate with constipation until the individual has been treated or the symptoms resolve spontaneously. One of the most distinguishing features of illness is the prolonged duration of diarrhea. The malabsorption of fats and fat soluble vitamins can occur with prolonged illness.[4,6] Chronic infections can last months to years.[4,7]

Extraintestinal invasion does not usually occur with giardiasis however, complications such as reactive arthritis, dehydration, growth retardation/failure to thrive and damage to duodenal and jejunal mucosal cells can occur.[1,8,9] Other complications of giardiasis include lactose intolerance, chronic fatigue and irritable bowel syndrome that can remain years after infection has resolved.[10–15]

Reservoir

Giardia can be found in humans, domestic and wild animals, water sources that have become contaminated by human and animal feces, and contaminated food.[1]

Transmission

The transmission of *Giardia* most commonly occurs through the ingestion of untreated water and occasionally from swimming in contaminated water sources.[1,2] Infection may also be acquired via consumption of fecally-contaminated food.

Person-to-person transmission (e.g., fecal-oral) is the second most common mode of spread. Contaminated soil and fomites can also have infectious cysts present.[7,16]

The infectious dose is generally less than 10 cysts. Persons infected with *Giardia* excrete large numbers (1 – 10 billion) of infectious cysts.[17,18]

Giardia cysts survive for weeks to months in cold water and are resistant to normal water treatment methods such as chlorination and ozonolysis.[19,20] Cysts are susceptible to boiling or freezing.[3,5]

Incubation Period

The incubation period ranges from 3 – 25 or more days, but is usually between 7 – 10 days.[1]

Period of Communicability

Giardiasis is communicable during the entire period of infection, which may last months.[1,2] Five to 15% of individuals become asymptomatic cyst shedders.[2]

Host Susceptibility

Susceptibility is universal, however those at higher risk include:[1,2,21–23]

- Travelers to/recent immigrants from countries where giardiasis is common,
- People in childcare settings,
- men who have sex with men,
- persons in care institutions,
- patients who have had previous gastric surgery and/or reduced gastric acidity, and
- backpackers, hikers or campers or others who drink untreated water (e.g., river water).

Persons with immunodeficiencies (e.g., HIV or AIDS) can experience a more serious and prolonged illness or may be more difficult to treat.[1,2] Children younger than five years of age and pregnant women, may have severe illness characterized by weight loss and require hospitalization. Breast milk can be protective and even cytotoxic against Giardia.[2]

Incidence in Alberta

Giardiasis is a notifiable disease in Alberta and in Canada. *Giardia lamblia* is the most common intestinal parasite reported worldwide each year.[1,2,21]

From 2010 to 2016, the number of cases of giardiasis cases reported in Alberta has been fewer than 500 cases per year.[24] Approximately 50–60% of cases occur in travellers or recent immigrants.

Refer to the Interactive Health Data Application (IHDA) for the incidence of giardiasis in Alberta.

Public Health Management

Diagnosis

Giardiasis should be considered in persons with prolonged diarrhea especially when associated with malabsorption or weight loss. The diagnosis is most often made by examination of stool for ova and parasites (O&P), looking for trophozoites or cysts. The time from ingestion of cysts to detection of cysts in the stool may be longer than the incubation period, thus stool examination at the time of onset of symptoms may be negative.

Antigen detection in stool by EIA is useful for screening large numbers of specimens and is more sensitive than the O&P exam for identifying *Giardia*.

PCR testing is extremely sensitive and specific for the detection of the giardia parasite, although it may miss concurrent or alternative infections by other organisms.

Key Investigation

- Confirm that the case meets the case definition.
- Obtain a history of illness including the date of onset, and signs and symptoms.
- Identify any underlying medical conditions that may increase host susceptibility.
- Determine the occupation of the case (e.g., food handler, childcare facility worker, healthcare worker) and identify specific duties at work.
- Determine the possible source of infection of all confirmed and probable cases taking into consideration the incubation period[(B)], reservoir, and mode of transmission. Assessment may include determining, obtaining or identifying:
  - a detailed food history including recent consumption of potentially contaminated food or water and the time of consumption,
  - attendance at daycare or institutions,
  - potential for occupational exposure (e.g., animal or meat handling),
  - recent travel,
  - residing in areas with poor sanitation including improper water treatment and sewage disposal either in Canada or abroad,
  - exposure to fowl, domestic or wild animals including identifying recent illness in pets or acquisition of a puppy, kitten, etc. into the household,
  - high risk sexual practices, especially contact with feces,
- Suspected contaminated food may be held or destroyed to prevent of consumption.
- Identify contacts, especially those that are SSO* contacts (Refer to Table 1):
  - Persons living in the household,
  - Children and childcare workers at a childcare facility (daycare, dayhome, or other childcare site), and
  - Individuals exposed to the same source where the source is identified.

[(B)] The incubation period of giardiasis is usually 7–10 days however, individual cases can vary requiring flexibility when determining where and how the disease was likely acquired.

Table 1: Sensitive Situations or Occupations (SSO)[1]

Sensitive Situation or Occupation	Definition
Food handler	• Touches unwrapped food to be consumed raw or without further cooking and/or • Handles equipment or utensils that touch unwrapped food to be consumed raw or without further cooking. *NOTE: Generally, food handlers who do not touch food, equipment or utensils in this way are not considered to pose a transmission risk however, circumstances for each case should be assessed on an individual basis.*
Healthcare, childcare or other staff	• Has contact through serving food to highly susceptible persons. • Provides direct patient care and are involved in the care of young children, elderly or dependent persons.
Child attending a childcare facility or similar facilities	• Is diapered or unable to implement good standards of personal hygiene.
Any individual (older child or adult)	• Is unable to implement good standards of personal hygiene (e.g., those with disabilities/challenges that may impact ability to perform good hand hygiene) and is involved in an activity that may promote disease transmission.

Management of a case

- All cases should be advised of the following:
  - How the disease is transmitted, appropriate personal hygiene, routine infection prevention and control practices, and contact precautions,
  - to avoid food preparation until symptoms have resolved,
  - to practice safer sex and avoid sexual practices that facilitate fecal-oral transmission, and
  - to avoid recreational water (e.g., swimming pools) until after treatment is completed and diarrhea has resolved.[21]
- Contact precautions should be used in healthcare settings where children or adults have poor hygiene or incontinence that cannot be contained.
- Refer to Table 2 for case exclusion criteria.

Table 2: Case Exclusion

Cases	Category	Exclusion Criteria
Symptomatic	SSO*	• The MOH may by order exclude the case until 48 hours after appropriate antibiotic treatment has been completed and stools have returned to normal or the MOH is satisfied that the case is no longer infectious. ***NOTE:*** *The case must be symptom free for 48 hours after stopping any antidiarrheal medication (if taken).* ○ Lifting of exclusions is not conditional upon submission of stool specimens** to demonstrate clearance of the organism. ○ If possible, consideration may be given to temporary redeployment away from activities that involve increased risk of transmission.
Symptomatic	Non-SSO	• No exclusion required, however all cases of gastroenteritis or enteritis should be regarded as potentially infectious and ***should*** remain home from work, school or daycare until 48 hours after diarrhea has stopped.
Asymptomatic	SSO*	• Generally not required unless otherwise recommended by the MOH.
Asymptomatic	Non-SSO	• No exclusion required.

**Persons who are involved in sensitive situations or occupations.*
***Specimens may still be submitted on a case-by-case basis in consultation with the MOH.*

Treatment of a Case

- Symptomatic cases should be treated with antibiotics.[1]
- Treatment of asymptomatic carriers is generally not recommended unless it is to prevent disease transmission to a high risk household contact (e.g., child under 5, pregnant woman, immunocompromised, hypogammaglobulinemia, cystic fibrosis).[21,25]

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 with positive stool specimens should be treated as cases.
- Refer to Table 3 for Contact Exclusion.

Table 3: Contact Exclusion

Contacts	Category	Exclusion Criteria
Symptomatic	SSO*	• The MOH may by order exclude (same as per case). ○ Ensure the contact is assessed by their physician.
Symptomatic	Non-SSO	• No exclusion required. • Refer to their physician for assessment and testing, if required.
Asymptomatic	All	• No exclusion - contacts should monitor themselves for gastrointestinal symptoms, maintain good hand hygiene and food handling practices and seek medical attention if symptoms develop.

**Persons who are involved in sensitive situations or occupations.*

Preventive Measures

- Educate the public about the following:
  - personal hygiene, especially the sanitary disposal of items containing feces,
  - careful hand washing after defecation and sexual contact, and before preparing or eating food,
  - washing cutting boards, counter tops and utensils with soap and water after contact with raw poultry (and other foods of animal origin),
  - cooking poultry and other meats thoroughly,
  - washing hands after contact with farm animals, pets, animal feces, and animal environments, especially where the animals/pets are ill with diarrhea,
  - the risk of sexual practices that permit fecal-oral contact and,
  - accessing and drinking safe water supplies.
- Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, and thorough hand washing.
- Test private water supplies for presence of parasitic contamination, if suspected.
- Educate campers, backpackers, and others to avoid drinking water directly from streams. Water should be boiled for at least one minute before it is used for drinking, food preparation, and oral hygiene.

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