Giardiasis

CHAPTER CONTENT

This chapter was adapted with permission form Alberta Health. For more information on giardiasis see Alberta Public Health Disease Management Guidelines: Giardiasis.

1. CASE DEFINITION

Confirmed Case

- Laboratory confirmation of infection with or without clinical illness*
  - 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* in a person who is epidemiologically linked to a confirmed case

*Clinical illness is characterized by diarrhea, abdominal cramps, bloating, weight loss, fatigue, or malabsorption.

2. DIAGNOSIS

- Diagnosis is made based on clinical illness coupled with laboratory confirmation
- 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
- For more information, refer to the Alberta Provincial Laboratory Guide to Services

3. REPORTING

Health Care Professionals

- Confirmed or probable cases are to be reported to the Office of the Chief Public Health Officer (OCPHO) by telephone (867) 920-8646, fax (867) 873-0442, or email within **24 hours *AND***
- Within **24 hours** complete and fax
  - The Food and Waterborne Illness Investigation Form to the Environmental Health Office at (867) 669-7517 ***AND***
  - The Communicable Disease Report Form to the OCPHO at (867) 873-0442
- **Immediately** report all outbreaks or suspect outbreaks by telephone (867) 920-8646 to the OCPHO

Laboratories

- Report all positive results to the OCPHO by fax (867) 873-0442 within **24 hours**

4. OVERVIEW

Causative Agent

- *Giardia lamblia* (also called *G. intestinalis*, *G. duodenalis* or beaver fever), is a parasite that infects the biliary tract and upper small intestine
- *Giardia lamblia* is one of the most common causes of endemic and epidemic diarrhea throughout the world
- It exists in trophozoite (free living) form and cyst form
- The cyst is the infective form and is sporadically excreted in feces
- *Giardia* cysts survive well in the environment, particularly in cold water
- Boiling for a minimum of one minute may inactivate them

Clinical Presentation and Major Complications

For more information regarding the clinical presentation and major complications of giardiasis see Alberta Public Health Disease Management Guidelines: Giardiasis.

Transmission

- *Giardia* can be found in humans, domestic and wild animals, water sources that have become contaminated by human and animal feces, and contaminated food
- The transmission of *Giardia* most commonly occurs through the consumption of untreated water and occasionally from swimming in contaminated water sources
- Surface water can easily become contaminated by the feces of human or animal sources
- Routine water treatment does not kill *Giardia* cysts - filtration is necessary
- Waterborne outbreaks have occurred in communities that derive water from sources without a filtration system
- 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
- The infectious dose is generally less than 10 cysts
- Persons infected with *Giardia* excrete large numbers (1 – 10 billion) of infectious cysts
- *Giardia* cysts survive for weeks to months in cold water and are resistant to normal water treatment methods such as chlorination and ozonolysis
- Cysts are susceptible to boiling and freezing

Incubation Period

- The incubation period ranges from 3 – 25 or more days but is usually between 7 – 10 days.
- 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.
- Giardiasis is communicable during the entire period of infection (as long as a person excretes the cysts), which may last months.
- Most adults clear the infection spontaneously in 1-3 months.
- 5 to 15% of individuals become asymptomatic cyst passers.

Clinical Guidance

- For patient-specific clinical management consult your local healthcare professional, paediatrician, infectious disease specialist or the NWT Clinical Practice Guidelines.

5. PUBLIC HEALTH MEASURES

Key Investigations

- Confirm that the case meets the case definition
- Obtain a history of illness including the date of onset, 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, 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
  - Residence 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:
  - Persons living in the household
  - Children and childcare workers at a childcare facility (daycare, day home, or another childcare site)
  - Individuals exposed to the same source where the source is identified

Management of Cases

- All cases should be instructed:
  - About disease transmission, appropriate personal hygiene, routine practices, and contact precautions
  - To avoid food preparation until symptoms have resolved
  - To practice safe sex and avoid sexual practices that facilitate fecal-oral transmission
  - To avoid recreational water (e.g., swimming pools) until after treatment is completed and diarrhea has resolved
- Contact precautions should be used in healthcare settings where children or adults have poor hygiene or incontinence that cannot be contained

- Exclusion should be considered for symptomatic cases who are:
  - **Food handlers** whose work involves:
    - Touching unwrapped food to be consumed raw or without further cooking
    - Handling equipment or utensils that touch such food
  - **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, and who are 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
  - **Older children or adults** who are unable to implement good standards of personal hygiene (e.g., mentally, or physically challenged)
- The CPHO (or designate) may order that the case be excluded until 48 hours after appropriate antibiotic treatment has been completed and stools have returned to normal, or the CPHO (or designate) is satisfied that the case is no longer infectious
  - 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
- Generally, exclusion is not required for symptomatic cases who do not have the above occupations or situations
  - 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
- Generally, asymptomatic cases are not required to isolated unless recommended by the CPHO or designate

Management of Contacts

- Contacts include:
  - Persons living in the household
  - Children and childcare workers at a childcare facility (daycare, day home, or another childcare site)
  - Individuals exposed to the same source where the source is identified
- Contacts should be instructed in disease transmission, appropriate personal hygiene, routine practices, and contact precautions
- Contacts with a positive stool specimen should be treated as a case

- Symptomatic contacts should be assessed by a physician
- The CPHO or designate may order exclusion for symptomatic contacts who are:
  - **Food handlers** whose work involves,
    - Touching unwrapped food to be consumed raw or without further cooking
    - Handling equipment or utensils that touch such food
  - **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, and who are 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
  - **Older children or adults** who are unable to implement good standards of personal hygiene (e.g., mentally, or physically challenged)
- Exclusion is not required for other symptomatic contacts who are not in the above situations or occupations
  - These contacts should be refereed to a physician for assessment/testing
- Exclusion is not required for any contacts who are asymptomatic
  - However, they should be encouraged to self-monitor for gastrointestinal symptoms, maintain good hand hygiene and food handling practices, and to seek medical attention if symptoms develop

Prevention

- 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
  - 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
  - Educate about condom use for safer sex
  - 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
- Adherence to the regulations outlined in the Food establishment safety regulations of the NWT Public Health Act
- Test private water supplies for presence of parasitic contamination, if suspected

- Educate campers, backpackers, and others to avoid drinking water directly from streams
  - Untreated water should be boiled for at least one minute before it is used for drinking, food preparation, and oral hygiene
- Advise infected individuals to avoid food preparation
- Advise infected individuals to avoid using public swimming pools when feces cannot be contained or when experiencing diarrhea
  - Water contained in public swimming areas can be a vehicle for the human-to-human transmission of enteric pathogens
- Educate regarding good personal hygiene, especially hand washing for staff and children in institutions and daycares

6. PUBLIC & HEALTH PROFESSIONAL EDUCATION

- BC CDC: Giardiasis
- Government of Canada: Enteric Protozoa-*Giardia and Cryptosporidium*
- Government of the Northwest Territories: Field Guide to Wildlife Diseases
- US Centres for Disease Control and Prevention: *CDC/Giardia*

7. EPIDEMIOLOGY

- Rates of giardiasis are gradually decreasing and plateaued in Canada with a range from 16.53 cases per 100,000 in 2000 to 10.34 per 100,000 in 2021
- Rates are highest in young children
- Infection occurs most commonly in July and August
- For more information on the epidemiology of giardiasis in the NWT see: Epidemiological Summary of Communicable Diseases HSS Professionals

8. REFERENCES

Information for this chapter was adapted with permission from Alberta Health. For more information regarding giardiasis see Alberta Public Health Disease Management Guidelines: Giardiasis.

Additional references used in this chapter include:

1. Centers for Disease Control and Prevention Parasites-*Giardia* Transmission: https://www.cdc.gov/parasites/giardia/infection-sources.html
2. Public Health Agency of Canada. Notifiable Disease On-Line: Giardiasis: https://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/charts.php?c=yl