Giardiasis

Signs and Symptoms	• Variable, including diarrhea, abdominal cramps, gas (flatulence and "purple burps"), bloating, malabsorption (fatty stool), weight loss • Symptoms may be more severe with immunosuppression		
Incubation	Usually 7-10 days, range 3-25 days		
Case classification	**Clinical criteria**: Common symptoms are diarrhea, abdominal cramps, bloating, weight loss, malabsorption		
	Confirmed: clinically consistent with detection of *Giardia* organisms, antigen, or DNA in stool, intestinal fluids, tissue, biopsy, or other biological sample	**Probable**: clinically consistent with epi link to a confirmed case	**Suspect:** A case that does not meet the clinical description, or clinical information is not known, that meets the criteria for laboratory confirmation.
Differential diagnosis	Cryptosporidiosis, amebiasis, viral gastroenteritis, bacterial enteritis, celiac disease, Crohn disease, inflammatory bowel disease, irritable bowel syndrome, lactose intolerance		
Treatment	If symptomatic: metronidazole, tinidazole, or nitazoxamide		
Duration	Weeks; may be extended symptoms or shedding in some persons for months		
Exposure	Spread is fecal-oral (including sexual) or through contaminated water and food. Reservoirs are humans, cattle, dogs, beaver, other wildlife and other animals.		
Laboratory testing	Local Health Jurisdiction (LHJ) and Communicable Disease Epidemiology (CDE) can arrange testing if an outbreak is suspected (facility or water system) • Washington State Public Health Laboratories uses a DFA test on stool. Diagnostic testing should be done by a commercial laboratory. • **Best specimens**: **3 stools collected 48 or more hours apart, in parasite collection vial** • Keep all specimens **cold, ship cold** and ship according to PHL requirements https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu		
Public health actions	LHJ can consult with CDE 206-418-5500 or 877-539-4344 for testing in outbreak investigations • Identify potential exposures from people (particularly child care settings and sexual partners), animals, food, drinking water, recreational water, and during travel • Identify potential outbreaks from common sources • Educate about ways to prevent fecal-oral transmission including hand washing • Exclude from sensitive occupation or setting such as daycare attendance or work, food handling, and health care until diarrhea ends • Recommend no use of public swimming areas until 2 weeks after diarrhea ends • Persons with diarrhea should avoid close contact with immunocompromised persons • Recommend standard and contact precautions to control institutional outbreaks *Infection Control:* standard precautions with added contact precaution for diapered or incontinent persons		

Giardiasis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify outbreaks and potential sources of ongoing transmission.
2. To prevent further transmission from such sources.

B. Legal Reporting Requirements

1. Health care providers and Health care facilities: notifiable to **local health jurisdiction** within 3 business days.
2. Laboratories: notifiable to **local health jurisdiction** within 2 business days; submission on request – within 2 business days.
3. Local health jurisdictions: notifiable to Washington State Department of Health (DOH) Office of Communicable Disease Epidemiology (CDE) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigative Responsibilities

1. Collect basic information about all cases, including demographic data and hospitalization/death status.
2. Monitor cases reports for outbreaks and investigate outbreaks.
3. Report all *confirmed*, *probable,* and *suspect* cases through the Washington Disease Reporting System (WDRS) using the DOH giardiasis investigation form. https://www.doh.wa.gov/Portals/1/Documents/5100/210-026-ReportForm-Giardia.pdf

*Note: Due to limited public health resources, investigating and educating individual cases are considered **optional** activities.*

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Giardia intestinalis (*G. lamblia, G. duodenalis*), a protozoan parasite with two life cycle stages. The relatively hardy cyst is the infectious stage. It can remain viable in the environment for up to months but can be killed by boiling, disinfection, or adequate filtration. After ingestion, cysts develop in the upper small intestine into trophozoites, the motile, feeding, reproducing, and symptom-causing stage. Infected persons shed trophozoites and cysts in stool, but trophozoites do not survive in the environment.

B. Description of Illness

Symptoms vary, but typically include diarrhea, abdominal cramps, bloating, and flatulence, and weight loss. They may persist for weeks and can be intermittent or chronic. As the illness progresses, fat absorption is impaired and stools can develop a higher fat content (steatorrhea). Illness may be more severe in immunocompromised patients (e.g., untreated AIDS, chemotherapy). Asymptomatic infections are common.

C. Giardiasis in Washington

Recently around 300 to 700 cases of giardiasis have been reported annually in the state. Commonly reported exposures include international travel and recreational water.

D. Reservoirs

Humans and some animals are hosts for this parasite. Overall, humans are the most important source of other human infections. The importance of non-human reservoirs is unclear. Cattle, beaver, and other wildlife may contaminate surface water supplies; domestic animals or pets (dogs, cats) may be sources for some human exposures.

E. Modes of Transmission

Transmission is fecal-oral. Examples include:

1. Contact with infected persons (i.e., those in the same household or child care);
2. Drinking fecally contaminated and inadequately treated water;
3. Ingesting fecally contaminated recreational water (rivers, lakes, etc.);
4. Eating food contaminated by animals or food handlers (rare but documented); and
5. Certain types of sexual contact (e.g., oral-anal contact).

F. Incubation Period

Variable, 3–25 days (or longer); median 7–10 days.

G. Period of Communicability

The typical shedding period is poorly defined and may be intermittent. Persons are likely communicable as long as cysts are being shed, which may be many months.

H. Treatment

Medications for treating giardiasis include: metronidazole, tinidazole, and nitazoxanide with alternatives including paromycin, quinacrine, and furazolidone; not all are available in this country. In general, treating asymptomatic carriers is not recommended.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

An illness caused by the protozoan *Giardia lamblia* (aka *G. intestinalis* or *G. duodenalis*) and characterized by gastrointestinal symptoms such as diarrhea, abdominal cramps, bloating, weight loss, or malabsorption.

B. Laboratory Criteria for Diagnosis

Detection of *Giardia* organisms, antigen or DNA in stool, intestinal fluid, tissue samples or biopsy specimens, or other biological sample.

C. Case Definition (2011)

Probable: a case that meets the clinical description and that is epidemiologically linked to a confirmed case.

Confirmed: a case that meets the clinical description and the criteria for laboratory confirmation as described above.

***Suspect:* a case that does not meet the clinical description, or clinical information is not known, that meets the criteria for laboratory confirmation as described above.

***The CSTE/CDC case definition does not include a 'suspect' classification. In order to better track the burden of giardiasis in Washington, a suspect classification has been added to address cases which are laboratory confirmed but the clinical symptoms are either absent or unknown.*

4. DIAGNOSIS AND LABORATORY SERVICES

A. Laboratory Diagnosis

The diagnosis of giardiasis is commonly made by the identification of trophozoites or cysts in stool specimens. The organism can either be directly visualized on routine ova and parasite (O&P) testing or visualized using a direct fluorescent antibody test. Enzyme immunoassays (EIA) are also commonly used to diagnose giardiasis. Many gastrointestinal syndrome PCR panels include Giardia; these tests detected the DNA of the parasite.

B. Services Available at the Washington State Public Health Laboratories (PHL)

In outbreak situations, PHL provide direct fluorescent antibody (DFA) testing on stool. Consult Office of Communicable Disease Epidemiology before submitting specimens.

Note that PHL require all clinical specimens have two patient identifiers, a name **and** a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.

C. Specimen Collection

To maximize the likelihood of detecting *Giardia*, three stool specimens should be collected 48 hours apart or over a 10-day period. Stool should be stored and transported either in Para Pac ULTRA ECOFIX™ or in one tube with 10% formalin and one tube with PVA. If the ECOFIX™ kit is being used, stool should be added to the collection kit until the fluid level reaches the red line marked on the outside of the tube. The kit should then be mixed and shipped at room temperature. For details of specimen requirements see: https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu
Specimens need to be shipped according to PHL requirements https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu

5. ROUTINE CASE INVESTIGATION

*The following section describes a routine case investigation for giardiasis. Due to limited public health resources, investigating and educating individual cases are considered **optional** activities. Suspected or confirmed outbreaks should be investigated.*

A. Manage the Case

1. Hospitalized patients should be cared for using standard precautions. In addition, contact precautions should be used for diapered or incontinent persons for the duration of illness or to control institutional outbreaks.
2. Educate regarding modes of transmission and ways to prevent transmission to others.
   a. Practice good personal hygiene, including effective hand washing, particularly after

using the toilet, changing diapers, and before preparing or eating food. Stress the importance of proper hygiene, as excretion of the organism may persist for several weeks.

b. Do not enter public recreational water venues (e.g., pools, fountains, lakes) until 2 weeks after resolution of diarrhea.

c. Avoid sexual practices that may result in oral exposure to stool (e.g., oral-anal contact).

d. While symptomatic with diarrhea, avoid close contact with anyone who has a weakened immune system.

3. **School Restrictions:** Children should not attend school as long as they have diarrhea.

4. **Work or Child Care Restrictions:** Persons should not work as food handlers, child care attendants or health care workers, or attend child care as long as they have diarrhea.

B. Identify Potential Sources of Infection

Ask about possible exposures in the 3 to 25 days before onset, including:

1. Contact with any sexual contact, household member or acquaintance with a similar illness (anyone meeting the probable case definition should be reported and investigated in the same manner as a confirmed case);
2. Attendance or work at a child care facility by the case or a household member;
3. Source(s) of drinking water, including water at home and work, as well as streams, lakes or other untreated sources;
4. Recreational water exposures: lakes, rivers, swimming pools, water slides, etc.;
5. Travel outside the area;
6. Contact with livestock and other animals.

C. Identify and Manage Contacts and Other Potentially Exposed Persons

1. Contacts: Collect the name, age, and phone number of contacts with a similar illness. Symptomatic contacts who meet the probable case definition should be investigated as a case.
2. Others at risk for exposure: If a suspected source of infection is identified and has the potential for transmitting infection to a defined population (e.g., contaminated well, infected animal), advise those individuals on measures to avoid exposure.

D. Environmental Evaluation and Measures

Conduct an environmental evaluation if an ongoing source of exposure to Giardia is suspected, such as a recreational water venue, drinking water system or child care facility.

E. Outbreak Investigation

Outbreaks are not common and investigation may not identify the exposure. In the United States outbreaks have been person-to-person, foodborne, and waterborne. See: https://www.cdc.gov/mmwr/volumes/70/wr/mm7009a2.htm#F1_down

6. MANAGING SPECIAL SITUATIONS

A. Case Attends or Works at a Child Care Facility

1. Exclude persons with giardiasis from work or attendance at a child care facility until the diarrhea has resolved.
2. If the facility cares for diapered children, interview the operator and inspect the written attendance records to identify other possible cases among staff or attendees during the past two months. Note: WAC 170-295-3030 specifies that the facility operator keep a log of illnesses and that parents be notified if their children have been exposed to infectious diseases or parasites.
3. If an outbreak is suspected:
   - Facilitate testing of stool specimens from symptomatic staff members, attendees, and family members who have a diarrheal illness consistent with giardiasis.
   - Exclude all symptomatic persons from the child care facility until diarrhea resolves. Testing and exclusion of asymptomatic carriers, even in the setting of a child care outbreak, is generally not recommended.
   - Instruct the operator and staff about proper food handling, hand washing after diaper handling or bathroom use, and the importance of separating diaper changing areas and food preparation areas.
   - Instruct the operator regarding environmental sanitation, particularly in diaper changing areas.
   - Instruct the child care operator to call the local health jurisdiction immediately if new cases of diarrhea occur.
   - Follow up with the child care center to ensure that surveillance and appropriate prevention measures are being carried out. Manage newly symptomatic children as outlined above.

B. Contaminated Swimming Pools

Fecal accidents in pools pose a risk to other swimmers. For additional information, see: https://www.cdc.gov/model-aquatic-health-code/media/pdfs/fecal-incident-response-guidelines.pdf
https://www.cdc.gov/healthy-swimming/response/index.html

7. ROUTINE PREVENTION

A. Immunization Recommendations: None

B. Prevention Recommendations (see: https://www.cdc.gov/giardia/prevention/?CDC_AAref_Val=https://www.cdc.gov/parasites/giardia/prevention-control.html)

1. **Practice good hygiene.**
   a. Wash hands thoroughly with soap and water after using the toilet; before handling or eating food; after changing a diaper or assisting with toileting; after caring for somebody who is sick; after touching something that could be contaminated (such as

a trash can, cleaning cloth, drain, or soil); and after handling animals or their toys, leashes, or feces.

b. Assist or visually supervise young children and other people you are caring for with hand washing as needed.

c. Wash hands thoroughly after contact with animals, particularly young livestock or animals with diarrhea. Minimize contact with animal feces

d. Keep *Giardia organisms* and other germs out of pools, lakes, hot tubs, fountains, water parks, splash parks, lakes, etc., by taking the following steps:

- Protect others by not swimming if you are experiencing diarrhea and for 2 weeks after your diarrhea stops. This is essential for children in diapers.
- Shower with soap and water before entering the water, especially the genital and rectal areas.
- Take children on frequent bathroom breaks or check their diapers often.
- Wash children thoroughly (especially the rectal area) with soap and water after they use the bathroom or after their diapers are changed.
- Change diapers in the bathroom or a designated diaper-changing area.

2. Avoid drinking water that might be contaminated.

a. Do not drink untreated water from shallow wells, lakes, rivers, springs, ponds, streams, or the ocean.

b. Do not drink untreated water or use ice made from untreated water during community-wide outbreaks of disease caused by contaminated drinking water.

c. Do not swallow recreational water (pools, hot tubs, fountains, lakes, rivers). For more information on recreational water-related illness, visit CDC's Health Swimming website:
https://www.cdc.gov/model-aquatic-health-code/media/pdfs/fecal-incident-response-guidelines.pdf
https://www.cdc.gov/healthy-swimming/response/index.html

d. Do not drink untreated water or use ice made from untreated drinking water in countries where the water supply might be unsafe. For information on traveler's health and giardiasis, visit CDC's Yellow Book:
https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/giardiasis.

e. Obtain recommendations on safe drinking water sources if severe flooding occurs. Shallow private well in flooded areas may need to be checked before use.

3. If you are unable to avoid using or drinking water that might be contaminated, then you can make the water safer to drink by doing one of the following:

a. Heat the water to a rolling boil for at least 1 minute (at altitudes greater than 6,562 feet [>2,000 meters], boil water for 3 minutes).

b. Use a filter that has an absolute pore size of 1 micron or smaller, or one that has been NSF rated for "cyst removal". For information on choosing a water filter, see CDC's A Guide to Water Filters fact sheet, available at: https://www.cdc.gov/healthywater/drinking/travel/backcountry_water_treatment.html

c. Chemical treatments (e.g., chlorine, iodine) are often not effective for preventing cryptosporidiosis and are not recommended.

4. **Avoid food that might be contaminated.**
   a. Use safe, uncontaminated water to wash all food that is to be eaten raw.
   b. Wash and/or peel all raw vegetables and fruits before eating.
   c. After washing vegetables and fruit in safe, uncontaminated water, peel them if you plan to eat them raw.
   d. Avoid eating uncooked foods when traveling in countries with minimal water treatment and sanitation systems.
5. **Avoid fecal exposure during sexual activity. This is especially important while experiencing diarrhea caused by cryptosporidiosis.**
   a. Use a barrier during oral-anal sex.
   b. Wash hands immediately after handling a condom used during anal sex or after touching the anus or rectal area.

ACKNOWLEDGEMENTS

This document is a revision of the Washington State Guidelines for Notifiable Condition Reporting and Surveillance published in 2002 which were originally based on the Control of Communicable Diseases Manual (CCDM), 17th Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

UPDATES

January 2011: The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.Case classifications and laboratory criteria revised in accordance with 2011 CSTE case definitions.

December 2012: Section 1C: Due to limited public health resources, individual case investigations are an optional activity for local health jurisdictions.
Section 5 and 6: The content in these sections was reorganized.

December 2016: Front page was added, minor revisions in Section 7 Routine Prevention.

July 2018: Added a 'suspect' case classification, added information about PCR testing.

February 2022: Routine review

December 2022: For WAC revision combined provider and facility reporting requirement, updated laboratory submission (Section 1B)

December 2023: For WAC revision updated laboratory submission.

June 2024: CDC links updated

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