

Giardiasis

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Giardiasis refers to disease caused by *Giardia lamblia* (also known as *G. intestinalis*), a protozoan parasite that has two forms: cyst and trophozoite. Infected persons can shed both trophozoites and cysts in stool. The cysts are infectious.

B. Clinical Description

Symptoms of giardiasis are variable but typically include watery, foul-smelling diarrhea. Abdominal cramps and a "bloated" feeling with excess gas often accompany the diarrhea. The diarrhea can be chronic or intermittent and it can be accompanied by fatigue and steatorrhea (fatty stools). Anorexia combined with malabsorption can lead to significant weight loss, failure to thrive in children, and anemia. However, many infections are asymptomatic. Symptoms often resolve in 2 to 6 weeks, but can last longer. Infected persons may wait to seek care for several weeks after onset because the symptoms can be intermittent.

C. Reservoirs

Humans are the primary reservoir, but dogs, cats, beavers and other animals can be infected.

D. Modes of Transmission

Giardia is transmitted via the fecal-oral route. The parasite can be spread directly from person to person or indirectly through ingestion of water or food contaminated with feces of infected persons or animals. Outbreaks due to person-to-person transmission can occur in child care centers and other institutions. Transmission can also occur through certain types of sexual contact (e.g., oral-anal contact). Localized outbreaks may occur from fecally contaminated water. This can be untreated or, rarely, treated drinking water such as stream, lake or well water or recreational waters such as swimming pools or jacuzzis that are open to contamination by human and animal feces. Eating food contaminated by an infected foodhandler can be a source, but this has been rarely documented. Transmission from infected animals can also occur.

E. Incubation Period

The incubation period can vary from 3 to 25 days (or longer); the median is 7-10 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes *Giardia* cysts, which generally begins at the onset of symptoms and can last for months. As with most enteric illnesses, persons with diarrhea are more infectious than those who are asymptomatic.

G. Epidemiology

Approximately 550-650 cases of giardiasis are reported in Colorado each year. Cases occur more commonly in the summer and fall. Giardiasis has a worldwide distribution. Children are infected more

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frequently than adults. Prevalence is higher in areas of poor sanitation and in institutions with children who are not toilet trained, such as child care centers.

Colorado Statistics are available at the CDPHE website:
www.cdphe.state.co.us/dc/CODiseaseStatistics

2) CASE DEFINITION

Important: Starting in 2011, confirmed cases must meet the clinical description as well as laboratory criteria. Asymptomatic persons with positive lab tests are no longer considered confirmed cases. In Colorado, they are classified as suspect cases. Historically, a portion of reported Colorado cases have occurred in new refugees and adoptees who are screened for Giardia when they enter the country. Often, these cases do not report current or recent symptoms, so they will be classified as suspect cases. When symptom information is missing from the CEDRS record, the case status will be 'unknown.' Only confirmed and probable cases are included in national disease statistics.

Clinical Description

An illness caused by the protozoan *Giardia lamblia* and characterized by diarrhea, abdominal cramps, bloating, weight loss, or malabsorption.

Laboratory Criteria for Diagnosis

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

Case Classification

Suspect: An asymptomatic case that meets the criteria for laboratory confirmation

Probable: A clinically compatible case that is epidemiologically-linked to a confirmed case

Confirmed: A case that meets the clinical description and the criteria for laboratory confirmation

3) REPORTING CRITERIA

What to Report to the Colorado Department of Public Health and Environment (CDPHE) or local health agency

- All positive *Giardia* laboratory tests should be reported to public health, regardless of whether the patient has or had symptoms. Public health will make the determination of whether the case meets the case definition.
- Giardiasis cases should be reported within 7 days of diagnosis or a positive laboratory test.
- Cases should be reported using the Colorado Electronic Disease Reporting System (CEDRS), or fax or telephone to CDPHE or local health departments. See below for CDPHE phone and fax numbers.
- Suspected foodborne/enteric disease outbreaks should be reported to CDPHE or local health departments within 24 hours, even if the causative agent has not yet been identified.

Purpose of Surveillance and Reporting

- To identify cases for investigation and potential outbreaks
- To monitor trends in disease incidence

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Important Telephone and Fax numbers

- CDPHE Communicable Disease Epidemiology Program
 - Phone: 303-692-2700 or 800-866-2759
 - Fax: 303-782-0338
 - After hours: 303-370-9395
- CDPHE Microbiology laboratory: 303-692-3480
- Communicable Disease (CD) Manual website:
http://www.cdphe.state.co.us/dc/epidemiology/dc_manual.html

4) STATE LABORATORY SERVICES

Laboratory Testing Services Available

- The CDPHE laboratory will test stool specimens for the presence of *Giardia* in situations where such testing is warranted for public health purposes using microscopy and/or a direct immunofluorescent assay.
- For more information on *Giardia* testing, contact the CDPHE Microbiology Laboratory.
- Note: Authorization by the CDPHE Communicable Disease Program is required before submitting stool or implicated food items to the CDPHE Laboratory.
- See Section 6 (E)--Environmental Measures, for more information about water and food testing.

5) CASE INVESTIGATION

Interview all reported cases of giardiasis, as well as symptomatic contacts of confirmed cases, or contact the medical provider to determine if the case meets the confirmed, probable, or suspect case status (based on whether the patient had symptoms).

Cases who report having had symptoms (confirmed or probable cases) should be fully interviewed by public health to determine:

- Potential source of infection, and implement control measures as appropriate
- If others are ill (i.e. Could this be an outbreak?)
- If the case may be a source of infection for others (e.g. a high-risk worker or a diapered child), and if so, prevent further transmission

If the case or the medical record indicates the patient had no symptoms, the case will be classified as suspect. No further public health investigation is necessary. Please complete the CEDRS extended record tab, especially symptom information and information about refugee status.

Local public health agencies have primary responsibility for interviews of sporadic cases in their jurisdictions. Smaller agencies should consult with regional epidemiologists to establish primary responsibility for interviews of sporadic cases.

A. Case Investigation / Forms

For single cases, complete the CDPHE Giardiasis Case Investigation Form that can be found on the CD manual website or a similar local health agency form. Local health departments are encouraged to use the standard CDPHE investigation form. Following patient interviews,

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complete the CEDRS record for all cases. If an outbreak is suspected, outbreak-specific interview forms should be used. Please contact CDPHE or your regional epidemiologist for assistance.

For agencies that choose to use their own case investigation forms, the following information should be collected:

- *Demographics (including address, date of birth, gender, ethnicity and race)*
- *Occupation (**High risk occupations include: food service, child care, and health care**)*
- *Childcare or School Attendance*
- *Symptoms and Onset Date*
- *Laboratory (date of specimen collection)*
- *Hospitalization and Medical Treatment Received*
- *Travel History (locations and dates)*
- *Drinking Water Source/Recreational water exposures*
- *Contacts with Persons with Gastrointestinal Illness*
- *Farm or Animal Exposure*
- *Restaurant History (include food items and date consumed)*

B. Identify and Evaluate Contacts

1. Symptomatic Contacts

- Contacts of a confirmed case who have diarrhea should be treated the same as confirmed cases for disease control purposes. See Section 6--Disease Control Measures.
- Refer symptomatic individuals who have not previously been tested (especially if they are high-risk workers) to their health care providers for stool testing.
- CDPHE recommends that people who are experiencing symptoms submit stool specimens through their health care provider rather than to the state laboratory for several reasons:
 - The patient will receive appropriate medical care for the illness.
 - Results will be known more quickly if stool is tested by a commercial laboratory than if tested at the state laboratory.
- If a common source of infection is suspected, please notify CDPHE. In this instance, lab testing of symptomatic persons by the CDPHE laboratory may be warranted. If testing will be performed by CDPHE, refer to the **Food and Stool Specimen Collection Instructions** on the CD manual website.

2. Asymptomatic Contacts

- Provide information about symptoms and preventive measures. See Section 6 (C)—Education.
- Ask about sensitive occupations such as food handling, childcare, and/or school.
- Counsel asymptomatic high-risk workers (e.g., food handlers). Stress importance of good handwashing, personal hygiene, and removing themselves from working and notifying their supervisor whenever they have a diarrheal illness.
- If an asymptomatic contact who is a high-risk worker develops diarrhea, exclude her/him from work, obtain a stool sample, and notify the worker's supervisor.

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C. Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of giardiasis in your jurisdiction is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. Consult with a CDPHE Communicable Disease Epidemiologist or your regional epidemiologist. CDPHE staff can assist local public health agencies to investigate outbreaks and determine a course of action to prevent further cases, and can coordinate surveillance of cases that cross county lines.

6) DISEASE CONTROL MEASURES

A Giardia Fact Sheet is available on the CD manual website.

A. Treatment

Symptomatic patients can be treated with a variety of antiparasitic medications. Specific regimens can be found in the Red Book (see references). Treatment of asymptomatic persons is not generally recommended.

B. Prophylaxis

No prophylactic treatment of close contacts is recommended.

C. Education

All cases should be counseled not to swim for 2 weeks after resolution of diarrhea. This is due to the typically extended period of shedding cysts, the low infectious dose, the hearty nature of *Giardia* cysts, and the fact that waterborne transmission is well documented.

To avoid exposure, recommend that individuals:

- Always wash their hands thoroughly with soap and water before handling food or eating, after using the toilet or changing diapers, and after contact with animals.
- After changing diapers, wash the child's hands as well as their own.
- Dispose of feces in a sanitary manner, especially in childcare centers or other institutional settings.
- Avoid drinking untreated/unfiltered water from streams or lakes. Avoid drinking unboiled water while traveling in developing countries or whenever else the water quality is unknown. The CDC has water treatment guidelines at: http://www.cdc.gov/travel/water_treatment.htm
- Adhere to local advisories to boil water.
- Avoid swallowing water when swimming. Lakes, streams (and other surface waters) and swimming pools may be contaminated with *Giardia*.
- Avoid fecal exposure during sex.

D. Managing Special Situations

1. Food Handlers

- Food handlers should be excluded from work until at least 24 hours after diarrhea has resolved and adequate hygiene can be maintained, ideally as verified by environmental health.
- In an outbreak situation, negative stool tests may be required to return to food handling.

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2. Childcare/ Preschool

Refer childcare providers to the CDPHE **Infectious Disease in Child Care Settings: Guidelines for Child Care Providers** (www.cdphe.state.co.us/dc/epidemiology/dc_guide.html) for additional *Giardia* information.

- Children and staff members with giardiasis who have diarrhea should be excluded until at least 24 hours after their diarrhea has resolved. Parents of cases should be counseled not to take their children to another childcare center during this period of exclusion.
- Reinforce the importance of meticulous handwashing with childcare center staff after diaper changes and toileting children. If possible, this should be verified by environmental health.
- Since most child care center staff are considered food handlers, see Section 6 (D1)--Food Handlers above.
- When a case of giardiasis is identified in a child attending childcare, determine whether additional children have or have recently had diarrhea. Other children with diarrhea should be excluded, should be seen by their physician, and should submit stool for testing. If other cases in the center are identified, consider sending a letter home to parents.
- If the case is the only child in the classroom or center who has been ill, no further action is indicated for other children in that classroom or center.
- Parents and staff should be reminded that cases should not swim or wade in pools for 2 weeks after resolution of diarrhea.

3. School

Refer school personnel to the CDPHE **Infectious Disease Guidelines for School Personnel** (www.cdphe.state.co.us/dc/epidemiology/dc_guide.html) for additional *Giardia* information.

- Students or staff with giardiasis who have diarrhea should be excluded until at least 24 hours after their diarrhea has resolved.
- In general, students or staff with giardiasis who do not have diarrhea and are not otherwise sick may remain in school.
- Students or staff who handle food and have giardiasis must not prepare food until their diarrhea has resolved. See Section 6 (D1)--Food Handlers.
- Parents and school staff should be reminded that cases should not swim or wade in pools for 2 weeks after resolution of diarrhea.

4. Community Residential Programs (facilities serving the developmentally disabled)

Actions taken in response to a case of giardiasis in a community residential program will depend on the type of program and the level of functioning of the residents. In general:

- Residents with giardiasis should be placed on contact precautions until at least 24 hours after diarrhea has resolved and adequate hygiene can be maintained.
- In rare circumstances, such as when a resident has questionable hygiene or is incontinent, the resident may need to remain on contact precautions until he/she has submitted three negative stool tests obtained at least 24 hours apart.
- Residents with giardiasis must be excluded from handling or preparing food for other residents until their diarrhea has resolved.

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- Staff members who provide direct patient care (e.g., feed patients, give mouth or denture care, or give medications) are considered foodhandlers. See section 6 (D1)--Food Handlers.
- Staff members with giardiasis should be excluded from work until at least 24 hours after their diarrhea has resolved.
- In an outbreak situation, negative stools may be required to return to work.

5. Patients and Staff in Health Care Facilities (Hospitals and Long Term Care Facilities)

Hospitals and long term care facilities generally have written infection control policies and procedures for handling cases of communicable disease among patients and staff members. If a facility does not have such policies in place, provide the following recommendations:

- Patients with giardiasis should be placed on contact precautions until 24 hours after their symptoms subside.
- Healthcare workers should be excluded from patient contact until diarrhea has resolved.
- In an outbreak situation, negative stool tests may be required to return to patient contact.

E. Environmental Measures

- If a private drinking water source is implicated, CDPHE recommends that the owner test for *Giardia* and can direct the owner to appropriate commercial laboratories to perform this testing.
- If a municipal drinking water source or other public supply is implicated, CDPHE will work with the Water Quality Control Division to ensure appropriate testing and follow up.
- If a food item is implicated, it must be removed from the environment.
- A decision about testing suspect/implicated food items must be made in consultation with CDPHE Communicable Disease Program.
- The general policy of the CDPHE Laboratory and the Communicable Disease Program is only to test food samples associated with outbreaks, not in single cases.
- For single cases, CDPHE or local health agencies may suggest that the holders of food locate a private laboratory that will test food, or that they store the food in their freezer for a period of time in case additional reports are received.
- The CDPHE laboratory can test food samples associated with isolated cases of illness on a fee for service basis. For more information, contact the CDPHE Microbiology Laboratory.

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