

GIARDIASIS

✓ DISEASE AND EPIDEMIOLOGY

Clinical Description:

Infection with *Giardia* may present as asymptomatic cyst passage, acute self-limited diarrhea, or a chronic syndrome of diarrhea, malabsorption, and weight loss. Acute symptoms are variable, but typically include watery, foul-smelling diarrhea, often accompanied by abdominal cramps and bloating with excess gas. Prolonged diarrhea and weight loss are distinguishing features of the disease. When the diarrhea becomes chronic or intermittent, it can be accompanied by fatigue and steatorrhea (fatty stools). Anorexia, combined with malabsorption, can lead to significant weight loss, failure to thrive, and anemia.

Causative Agent:

Giardia lamblia is a protozoan parasite that has two forms: the infectious cyst and the invasive trophozoite. Infected persons can shed both trophozoites and cysts in stool.

Differential Diagnosis:

The differential diagnosis includes diarrheal syndromes caused by viruses, noninvasive bacteria, and other protozoans.

Laboratory identification:

Identification of trophozoites or cysts in direct smear examination is the traditional method of identification. Antigen detection assays are available and increasingly becoming the test of choice. To enhance detection, the specimen should be processed as soon as possible after passing. Sensitivity increases by examining 3 or more specimens collected every other day.

USL:PH: The Unified State Laboratories: Public Health does not test for *Giardia*. Local laboratories test for *Giardia* using an ELISA test.

Treatment:

Metronidazole, administered in a 5-7 day course, is the drug of choice and has an 80-95% cure rate. Many other drugs are available and effective, including albendazole, furazolidone, nitazoxanide, and paromomycin. Furazolidone and nitazoxanide are both available in a liquid form for use in children. Paromomycin is the recommended drug for pregnant women. If therapy fails (about 10% of the time), an additional course can be repeated with same drug.

Case fatality:

Giardiasis is not typically associated with mortality, even in the immunocompromised.

Reservoir:

Humans and some animals (dogs, cats, rodents, cattle, deer, elk, beaver, and muskrats) are reservoirs, although the public health importance of most nonhuman reservoirs is debated. Overall, humans are the most important source of other human infections.

Transmission:

Ingestion of contaminated water – whether recreational, improperly treated or untreated– is the primary mode of transmission. Person-to-person transmission by fecal-oral transfer of cysts is the second most common mode, especially in institutions and daycare centers. Transmission can also occur from person-to-person through certain types of sexual contact (e.g., oral-anal contact). Eating food contaminated by an infected food handler can be a source, but this has been rarely documented.

Susceptibility:

Some people with regular exposure to *Giardia* may develop some degree of resistance to illness. Many people seem to have lasting immunity after infection. Cases occur more commonly in the summer and fall months.

Incubation period:

The incubation period is usually 7-10 days, but can vary from 3–25 days, or longer.

Period of communicability:

The disease is communicable for as long as the infected person excretes the organism, which may be many months.

Epidemiology:

Giardiasis has a worldwide distribution and is the most commonly identified intestinal parasite. Surveys conducted in the US have demonstrated prevalence rates of *Giardia* in stool specimens that range from 1–30%, depending on the location and age. Over the past 5 years in Utah, an average of 329 cases of *Giardia* are reported to UDOH annually. The prevalence of infection is higher in areas of poor sanitation and in facilities with children who are not toilet trained, especially daycare centers. Children are infected more frequently than adults.

PUBLIC HEALTH CONTROL MEASURES

Public health responsibility:

- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention
- Identify clusters or outbreaks of this disease and determine the source.
- Identify cases and sources to prevent further transmission.

Prevention:

Personal Preventive Measures/Education

To avoid exposure, persons should:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- Wash their own hands as well as the child's hands after changing diapers and dispose of diapers in a closed-lid garbage can.
- Wash their own hands when caring for someone with diarrhea. Hands should be scrubbed with plenty of soap and water after cleaning the bathroom, after helping the person use the toilet, or after changing diapers, soiled clothes, or soiled sheets.
- Avoid swallowing recreational water.
- Avoid swallowing pool or bath water, chlorination may not eliminate the parasite.
- Avoid swimming while ill with diarrhea and for at least 2 weeks after diarrhea.
- Be aware of the risks of drinking water from streams or lakes when hiking or camping. Bringing water to a full, rolling boil is sufficient to kill *Giardia*. Several filters are also available that remove *Giardia* cysts. Additionally, some chemical disinfectants are effective against *Giardia*.

Discuss transmission risks that may result from oral-anal sexual contact. Latex barrier protection (e.g., dental dam) may prevent the spread of giardiasis to a case's sexual partners and may prevent exposure to and transmission of other fecal-oral pathogens.

International Travel

Travelers to developing countries should:

- "Boil it, cook it, peel it, or forget it."
- Drink only boiled water or bottled carbonated beverages, keeping in mind that bottled carbonated water is safer than bottled non-carbonated water.
- Ask for drinks without ice, unless the ice is made from boiled water. Avoid popsicles and flavored ice that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel their own raw fruits or vegetables and not eat the peelings.
- Avoid foods and beverages from street vendors.

Chemoprophylaxis:

None.

Vaccine:

None.

Isolation and quarantine requirements:

Isolation: Food handlers with giardiasis must be excluded from work until diarrhea has resolved. Persons diagnosed with giardia should not use recreational waters for 2 weeks after symptoms resolve.

NOTE: A food handler is any person directly preparing or handling food. This can include a patient care or childcare provider.

Hospital: Enteric precautions.

Quarantine: Contacts with diarrhea that are food handling facility employees should be considered the same as a case and should be handled in the same fashion. No restrictions otherwise.

NOTE: In certain circumstances, cases, ill contacts, and/or asymptomatic contacts who are food handlers may be required to have negative stool samples prior to returning to work. The local health department will decide which cases and/or contacts will need negative stool samples prior to returning to work and whether 1 or 2 negative samples is necessary. If a case or contact has been treated with an antimicrobial agent, the stool specimen should not be collected until at least 48 hours after cessation of therapy. If 2 negative stool samples are determined to be necessary they should be taken at least 24 hours apart.

✓ CASE INVESTIGATION

Reporting:

All cases of giardiasis should be reported to public health.

Case definition:

Giardia (1997)

Clinical description

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

Infected persons may be asymptomatic.

Laboratory criteria for diagnosis

- Demonstration of *G. lamblia* cysts in stool on O&P exam, or
- Demonstration of *G. lamblia* trophozoites in stool, duodenal fluid, or small-bowel biopsy, or
- Demonstration of *G. lamblia* antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay)

Case classification

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

Confirmed: a case that is laboratory confirmed.

Case Investigation Process:

- Food handlers should be excluded from work until diarrhea has resolved. Negative stool specimens may also be required.

Outbreaks:

CDC defines a food-borne outbreak as, “an incident in which two or more persons experience a similar illness resulting from the ingestion of a common food”. In order to confirm an outbreak of giardiasis, there must be at least 2 ill persons and *Giardia* isolated from stool, duodenal contents, or small-bowel biopsy specimen or *Giardia* antigen detected in stool. Outbreaks of *Giardia* are typically associated with ingestion of contaminated water – recreational water or improperly treated or untreated water. *Giardia*

has become one of the most common causes of waterborne disease. Because the parasite is moderately chlorine-resistant, chlorinated pools may not protect against transmission.

Identification of case contacts and management:

Daycare

Since giardiasis may be transmitted from person-to-person through fecal-oral transmission, it is important to follow up on cases of giardiasis in a daycare setting carefully. General recommendations include:

- Children with giardiasis who have diarrhea should be excluded until their diarrhea is resolved.
- Children with *Giardia* infection who have no diarrhea and are not otherwise ill may be excluded or may remain in the program if special precautions are taken.
- Most staff in childcare programs are considered food handlers. Those with *Giardia* in their stool (symptomatic or not) can remain on site but must not prepare food or feed children until their diarrhea has resolved. Negative stool specimens may be required.

School

Since giardiasis may be transmitted from person-to-person through fecal-oral transmission, it is important to investigate cases of giardiasis in a school setting carefully. General recommendations include:

- Students or staff with giardiasis who have diarrhea should be excluded until their diarrhea is gone.
- Students or staff with giardiasis who do not handle food, have no diarrhea or mild diarrhea, and are not otherwise sick may remain in school at the discretion of school administrators if special precautions are taken.
- Students or staff who handle food and have giardiasis infection (symptomatic or not) must not prepare food until their diarrhea has resolved. Negative stool specimens may be required.

Community Residential Programs

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 long-term care facilities, residents with giardiasis should be placed on standard (including enteric) precautions until their symptoms subside. Staff members who provide direct patient care (e.g., feed patients, give mouth or denture care, or give medications) are considered food handlers and should be treated as such. In addition, staff members with giardiasis who are not food handlers should not work until their diarrhea is gone.

In residential facilities for the developmentally disabled, staff and clients with giardiasis must refrain from handling or preparing food for other residents until their diarrhea has subsided. Negative stool specimens may be required. In addition, staff members with *Giardia* infection who are not food handlers should consider not working until their diarrhea is resolved.

✓ REFERENCES

Centers for Disease Control, Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 46 (RR-10), 1997.1

Control of Communicable Diseases Manual (18th Edition), Heymann, D.L., Ed; 2004.

Red Book: 2003 Report of the Committee on Infectious Diseases (26th Edition), Larry K. Pickering MD, Ed; 2003.

Principles and Practice of Infectious Disease (6th Edition), Gerald L. Mandell, John E. Bennett, and Raphael Dolin Eds; 2005.

Massachusetts Department of Public Health, Guide to Surveillance, Reporting and Control, 2006.

Food and Drug Administration. The Bad Bug Book.

<http://vm.cfsan.fda.gov/~mow/intro.html>

Council of State and Territorial Epidemiologists Position Statements

<http://www.cste.org/ps2009/09-ID-34.pdf>