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Giardiasis

Overview ^{1, 2, 3}

Giardiasis is the most common intestinal parasitic infection of humans. *Giardia intestinalis* (*G. intestinalis*) formerly *Giardia lamblia* or *Giardia duodenalis* is a flagellate protozoan that exists as a trophozoite and in cyst form; the infective form is the cyst. Once a person or animal (e.g., cats, dogs, cattle, sheep, deer, rodents, beavers, non-human primates and other animals) have been infected with *Giardia*, the parasite lives in the intestines and is passed in feces. *G. intestinalis* are found worldwide and within every region of the United States.

The parasite can survive outside the body in the cyst form for long periods of time. People become infected when they swallow the parasite. The parasite can be found on anything (e.g. surfaces, soil, food, or water) that comes into contact with feces from infected humans or animals. Infected persons are communicable for as long as they excrete the cysts. The incubation period is usually 3-25 days but may be longer, with a median of 7-10 days.²

Asymptomatic infection is common, approximately 50% to 75% of infected people in outbreaks occurring in child care settings and in the community were asymptomatic.³ Symptomatic infections of *G. intestinalis* generally causes a self-limited clinical illness (i.e., giardiasis) typically characterized by diarrhea, abdominal cramps, nausea/vomiting, gas, greasy stools that tend to float, bloating, weight loss, dehydration (loss of fluids) and malabsorption.


Children are more frequently infected than adults, and prevalence is higher in areas with poor sanitation and institutions with children who are not toilet trained, such as child care centers. Giardiasis can also be spread to persons exposed to human feces through sexual contact. While the parasite can be spread in different ways, water (drinking water and recreational water) is the most common method of transmission.¹

To prevent and control giardiasis, it is important to:

- Practice good hygiene.
- Avoid water (drinking or recreational) that may be contaminated.
- Avoid eating food that may be contaminated.
- Prevent contact and contamination with feces during sex.

For a complete description of giardiasis, please refer to the following texts:

- ♦ *Control of Communicable Diseases Manual*. (CCDM), American Public Health Association. 19th ed. 2008.
- ♦ American Academy of Pediatrics. *Red Book: 2012 Report of the Committee on Infectious Diseases*. 29th ed. 2012.
- ♦ *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*. 7th ed. 2010.

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2011 Case Definition - Giardiasis⁴ (2/14)

Clinical Description

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.

Laboratory Criteria for Diagnosis

Laboratory-confirmed giardiasis shall be defined as the detection of *Giardia* organisms, antigen, or DNA in stool, intestinal fluid, tissue samples, biopsy specimens or other biological sample.

Case Classification

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. When available, molecular characterization (e.g., assemblage designation) should be reported.


Information Needed for Investigation

1. **Verify the diagnosis.** Obtain demographic, clinical and laboratory information on the case from the attending physician, hospital, and/or laboratory. Obtain the other epidemiological information necessary to complete the [Disease Case Report \(CD-1\)](#). For all confirmed and probable giardiasis cases complete a [Record of Investigation of Enteric Illness \(CD-2C\)](#) from the patient or a knowledgeable family member. **NOTES:** Asymptomatic persons with laboratory-confirmed giardiasis are **not** confirmed or probable cases based on the National Notifiable Diseases Surveillance System's case definition (provided above). Asymptomatic persons with laboratory-confirmed giardiasis should be "**no case**" status in WebSurv (e.g. a person is reported positive as the result of a refugee health screening and is contacted by the LPHA and found to be asymptomatic). It is important to stress good hygienic practices, especially good handwashing to prevent the spread of disease.

Establish the extent of illness. Ask about illnesses among household, childcare, hospital, long-term care and other close contacts. Determine if the case provided child or patient care, or prepared food for anyone outside the household.

Identify the source of infection.

- Does the case or a member of the case's household attend a child care center or nursery school, or have exposure to diaper-aged children?
- Has the case ingested untreated water from a spring, river, lake, stream, pond or well?
- Has the case swallowed water while swimming or playing in recreational water where *Giardia* may live, especially in lakes, rivers, springs, ponds and streams?
- Has the case traveled out of the country recently?
- Does the case have contact with feces from wild or domestic animals?

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- Have there been other cases linked by person, place, or time?
- Does the case engage in sexual practices that might place them or others at increased risk?

The Information obtained from the [Record of Investigation of Enteric Illness \(CD-2C\)](#) can be used to identify the source. Sometimes the source is not identified.

Provide information about giardiasis to persons at risk for infection and the general public. Efforts should be made to promote giardiasis awareness and provide prevention information to the public to reduce the risk of disease. Information on Giardiasis prevention can be found on CDC’s website at: <http://www.cdc.gov/parasites/giardia/prevent.html>.


Giardiasis Surveillance. Review WebSurv to determine whether there have been other cases in the same geographic area or institution. When cases are related by person, place, or time, efforts should be made to identify a common source. Information obtained through the [Record of Investigation of Enteric Illness \(CD-2C\)](#) is used to identify a possible source of infection and to characterize persons or geographic areas in which additional efforts may be needed to raise awareness and reduce disease incidence. When investigating a suspected outbreak of gastrointestinal illness of unknown etiology, see the [Outbreak Investigation](#) section of the CDIRM.

Notification

- Contact the [District Communicable Disease Coordinator](#), the [Senior Epidemiology Specialist](#) for the District, or MDHSS’ – Bureau of Communicable Disease Control and Prevention (BCDCP), phone (573) 751-6113, Fax (573) 526-0235, or for after hours notification contact the MDHSS’ ERC at (800) 392-0272 (24/7) immediately if an outbreak* of giardiasis is suspected.
- If a case(s) is associated with a childcare center, BCDCP or the LPHA will contact the Bureau of Environmental Health Services (BEHS), phone (573) 751-6095, Fax (573) 526-7377 and the Section for Child Care Regulation, phone (573) 751-2450, Fax (573) 526-5345.
- If a case(s) is associated with a foodhandler, BCDCP or the LPHA will contact BEHS, phone (573) 751-6095, Fax (573) 526-7377.
- If a case(s) is associated with a long-term care facility, BCDCP or the LPHA will contact the Section for Long Term Care Regulation, phone (573) 526-8524, Fax (573) 751-8493.
- If a case is associated with a hospital, hospital-based long-term care facility, or ambulatory surgical center, BCDCP or the LPHA will contact the Bureau of Health Services Regulation phone (573) 751-6303, Fax (573) 526-3621.
- Contact the Department of Natural Resources, Public Drinking Water Branch, at (573) 751-1187, Fax (573) 751-3110 if cases are associated with a public water supply, or BEHS, phone (573) 751-6095, Fax (573) 526-7377, if cases are associated with a private water supply.

*Outbreak is defined as the occurrence of illness(es) similar in nature, in a community or region, clearly in excess of normal expectancy and derived from a common or a propagated source.



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Control Measures

To prevent and control infection with the *G. intestinalis*, it is important to:¹

- Improved sanitation and practice good hygiene, especially in child care settings.
- Avoid water (drinking or recreational) that may be contaminated.
- Avoid eating food that may be contaminated.
- Prevent contact and contamination with feces during sex.
- People with diarrhea caused by *G. intestinalis* should not use recreational water venues (e.g., swimming pools, water slides) for two weeks after symptoms resolve.³

Child care centers.^{3,9} Improved sanitation and personal hygiene should be emphasized. Hand hygiene by staff and children should be emphasized, especially after toilet use or handling of soiled diapers. During outbreaks all symptomatic children, staff and family members infected with *G. intestinalis* should be treated. People with diarrhea should be excluded from the child care center until they become asymptomatic (diarrhea ceases for at least 24 hours). Treatment or exclusion of asymptomatic carriers is not effective for outbreak control and is not recommended.

Upon identification of a symptomatic case in a child care facility, the facility should be provided with the “[Sample Letter to Parents of Children Exposed to Giardiasis](#)” for notification.


High-risk settings or professions.^{3,8,9} Food handlers, child care providers and health care providers with symptoms should be treated. These persons should also be excluded from handling food, providing direct patient or child care until diarrhea ceases for at least 24 hours. Treatment of symptomatic persons relieves symptoms.

Laboratory Procedures¹

A Web site developed and maintained by CDC's Division of Parasitic Diseases and Malaria (DPDM) provides recommended procedures for collecting, shipping, processing and examining biologic specimens for giardiasis at: <http://www.cdc.gov/dpdx/giardiasis/dx.html>. Additional information is available at: <http://www.cdc.gov/parasites/giardia/diagnosis.html> and at: http://www.cdc.gov/dpdx/resources/pdf/benchAids/Giardia_benchaid.pdf. **NOTE:** *Because Giardia cysts can be excreted intermittently, multiple stool collections (i.e., three stool specimens collected on separate days) increase test sensitivity.*

For information on the collection or shipment of specimens to the Missouri State Public Health Laboratory (MSPHL), see their website at: <http://health.mo.gov/lab/routineoandp.php>. Their Ova and Parasite Stool Collection Instructions Sheet is available at: <http://health.mo.gov/lab/pdf/OvaandParasiteCollectionInstructions.pdf>.

Environmental Samples: The MSPHL will not test water supplies for *G. intestinalis* without substantial and convincing epidemiological evidence. If the water supply is suspected as the source of infection, it can be screened for coliform bacteria, which is a general indicator of the safety of the water.

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Reporting Requirements


Giardiasis is a Category 3 disease and shall be reported to the [local health authority](#) or to the Missouri Department of Health and Senior Services within three (3) calendar days of first knowledge or suspicion.

As a Nationally Notifiable Condition, **confirmed** and **probable** giardiasis cases are a **STANDARD** report to the Centers of Disease Control and Prevention (CDC). **STANDARD** reporting requires the Missouri Department of Health and Senior Services (MDHSS) to report to CDC by electronic transmission via WebSurv within the next normal reporting cycle.

2. For all reported cases, complete a [Disease Case Report \(CD-1\)](#).
3. For all confirmed and probable giardiasis cases complete a [Record of Investigation of Enteric Illness](#) (CD-2C) and collect the case's food history for the seven days prior to onset of the illness.
4. Entry of the completed CD-1 and the Record of Investigation of Enteric Illness form into WebSurv negates the need for the paper CD-1 and CD-2C to be forwarded to the District Health Office.
5. MDHSS will report to CDC following the above reporting criteria (see box).
6. All outbreaks or "suspected" outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the District Communicable Disease Coordinator. This can be accomplished by completing the [Missouri Outbreak Surveillance Report \(CD-51\)](#).
7. If an outbreak is associated with food, a CDC 52.13 form ([National Outbreak Reporting System – Foodborne Disease Transmission](#)) is to be completed and submitted to the District Communicable Disease Coordinator at the conclusion of the outbreak.
8. If an outbreak is associated with the consumption or use of water for drinking, or with ingestion, contact, or inhalation of recreational water, a CDC 52.12 form ([National Outbreak Reporting System - Waterborne Disease Transmission](#)) is to be completed and submitted to the District Communicable Disease Coordinator at the conclusion of the outbreak.
9. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the District Communicable Disease Coordinator.

References


1. Centers for Disease Control and Prevention. Parasites - *Giardia*. <http://www.cdc.gov/parasites/giardia/index.html> (2/14).
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3. American Academy of Pediatrics. *Giardia intestinalis* (formerly *Giardia lamblia* and *Giardia duodenalis*) Infections. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. *Red Book: 2012 Report of the Committee on Infectious Disease*, 29th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2012: 333-335.
4. CDC's National Notifiable Diseases Surveillance System (NNDSS) and Case Definitions. <http://www.cdc.gov/nndss/> (2/14).

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6. NCCLS Document M28-P, 1993: Procedures for the recovery and identification of parasites from the intestinal tract; proposed guidelines. National Committee for Clinical Lab. Standards, Villanova, PA.
7. Hill, David R. & Nash, Theodore E. *Giardia lamblia*. In: Gerald L. Mandell, John E. Bennett, & Raphael Dolin, Eds. *Principles and Practice of Infectious Diseases*, 7th ed., Pennsylvania: Churchill Livingstone Elsevier, 2010: 3527-3534.
8. United States Department of Health and Human Services, Public Health Service, Food and Drug Administration. 2009 Food Code.
<http://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/UCM2019396.htm> (2/14).
9. Missouri Department of Health and Senior Services. 19 CSR 30-60.060 Health Requirements (Rules for License-Exempt Child Care Facilities); 19 CSR 30-61.185 Health Care (Rules for Family Child Care Homes); 19 CSR 30-62.192 Health Care (Rules for Group Child Care Homes and Child Care Centers).

Other Sources of Information

1. eMedicine Journal. “Giardiasis.” Bhutani MS, ed. Cash, BD and Johnston M. December 12, 2006, Volume 7, Number 12, Giardiasis.
2. American Society for Microbiology. “Diagnostic Medical Parasitology.” 3rd ed. Washington, DC. 1997: 570.

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Sample Letter to Parents of Children Exposed to Giardiasis

DATE

To Parents/Guardian of Children attending
 [Child Care Center's Name]
 [Child Care Center's Address]

Dear Parents/Guardian:

A child who attends the [Child Care Center's Name] has been diagnosed with giardiasis. Giardiasis is a disease caused by a tiny intestinal parasite called *Giardia intestinalis*. The symptoms include gas, abdominal cramping, nausea and diarrhea. *Giardia* parasites leave the body through the feces of an infected person and enter another person when hands, food or objects (such as toys) contaminated with feces are placed in the mouth.

If your child or any member of your household has these symptoms or develops these symptoms, he/she should be tested for giardiasis. This is done by submitting a stool specimen(s) for examination, and can be done through your local health department. All symptomatic children, family members and childcare workers infected with *Giardia intestinalis* should be treated. Persons with diarrhea should be excluded from childcare until they are free of diarrhea for at least 24 hours.

An information sheet on giardiasis is [enclosed](#). If you have any questions on this issue please contact your health care provider or the [LPHA's Name] at [Phone Number].

Sincerely,