

Giardiasis

Giardia lamblia, Giardia intestinalis, Giardia duodenalis

Note: Case definition for Giardiasis has been changed (**highlighted in yellow**)

DISEASE REPORTABLE WITHIN 24 HOURS OF DIAGNOSIS

Per N.J.A.C. 8:57, healthcare providers and administrators shall report by mail or by electronic reporting within 24 hours of diagnosis, confirmed cases of giardiasis to the health officer of the jurisdiction where the ill or infected person lives, or if unknown, wherein the diagnosis is made. A directory of local health departments in New Jersey is available at <http://localhealth.nj.gov>.

If the health officer is unavailable, the healthcare provider or administrator shall make the report to the Department by telephone to 609.826.5964, between 8:00 A.M. and 5:00 P.M. on non-holiday weekdays or to 609.392.2020 during all other days and hours.



1 THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Giardia lamblia (also known as *Giardia intestinalis* or *Giardia duodenalis*) is a microscopic parasite that causes the diarrheal illness known as giardiasis. *Giardia* is a flagellate protozoan parasite that infects primarily the upper small intestine. The parasite exists in both trophozoite and cyst forms. The infective form is the cyst. Infected persons can shed both trophozoites and cysts in stool.

B. Clinical Description

Symptoms may include diarrhea, abdominal cramps, gas and bloating, nausea, vomiting, and frequent loose and pale, greasy stools. However, **many infections are asymptomatic**. The diarrhea can be chronic or intermittent and can be accompanied by fatigue and steatorrhea (fatty stools). Severe cases are associated with significant weight loss, malabsorption, failure to thrive, and anemia. In children, severe giardiasis might delay physical and mental growth, slow development and cause malnutrition.

Laboratory diagnosis is based on identification of cysts or trophozoites in the feces, identification of trophozoites in duodenal fluid or biopsy, detection of parasite antigen by enzyme immunoassay, or detection of parasites by immunofluorescence.

C. Reservoirs

Humans are the primary reservoir for human infections, but *Giardia* can also infect beavers, dogs, cats, and other animals. Zoonotic spread sometimes occurs.

D. Modes of Transmission

In order for an infection to occur, the susceptible host must ingest water or other materials contaminated with *Giardia*. Important methods of transmission include:

- 1. Waterborne:** Ingesting contaminated recreational water (rivers, lakes, swimming pools) or inadequately treated potable water (safe for drinking).
- 2. Person-to-person:** Includes fecal-oral transmission (infectious particles from feces are ingested through the mouth). This may occur through contact with infected person in the same

household, or child care facility, or through certain types of sexual contact, such as oral-anal contact.

3. Foodborne: Eating food contaminated by animals or food handlers, or eating raw foods rinsed off with contaminated water. Eating food contaminated by an infected food handler can be a source, but this has been rarely documented.

Giardia cysts (hard shells containing *Giardia*) are instantly infectious once they leave the host through feces. An infected person might shed 1-10 billion cysts daily in their feces and this might last for several months. However, swallowing as few as 10 cysts might cause someone to become ill. Outbreaks of giardiasis have been associated with fecally-contaminated drinking and recreational water, contaminated food, and daycare centers.

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 the organism, which may be many months. **The asymptomatic carrier rate is high.** An asymptomatic carrier is one who never developed symptoms of illness but sheds the organism and can transmit it to others.

G. Epidemiology

Giardiasis has a worldwide distribution. Children are infected more frequently than are adults. In the United States, *Giardia* infection is the most common intestinal parasitic disease affecting humans. Prevalence is higher in areas of poor sanitation and in institutions with children who are not toilet trained, especially daycare centers. Because there is a greater amount of time spent on outdoor activities, *Giardia* infection rates have been known to increase in the late summer.

2 CASE DEFINITIONS

A. New Jersey Department of Health (NJDOH) Case Definition

1. 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.

2. 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.

3. Case Classification

CONFIRMED

A case that meets the clinical description **and** the criteria for laboratory confirmation as described above. When available, molecular characterization (e.g., distinct genotypes) should be reported.

PROBABLE

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

POSSIBLE

Not used.

B. Differences from CDC Case Definition

There are no differences in the case definitions.

3 LABORATORY TESTING AVAILABLE

The NJDOH, Public Health, Environmental and Agricultural Laboratories (PHEAL) does not routinely test clinical and water samples for *Giardia lamblia* spp. If testing is needed in an outbreak situation, please contact NJDOH staff to discuss alternatives.

4 PURPOSE OF SURVEILLANCE AND REPORTING AND REPORTING REQUIREMENTS

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (e.g., people in childcare settings) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (e.g., a contaminated public water supply or a restaurant) and to stop transmission from such sources.
- To provide education about reducing the risk of infection.

B. Laboratory Reporting Requirements

The New Jersey Administrative Code (NJAC) 8:57 stipulates that laboratories report using the Communicable Disease Reporting and Surveillance System (CDRSS) all cases of giardiasis to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the healthcare provider requesting the laboratory examination is located. The report shall contain, at a minimum, the reporting laboratory's name, address, and telephone number; the age, date of birth, gender, race,

ethnicity, home address, and telephone number of person tested; the test performed; the date of testing; the test results; and the healthcare provider's name and address.

C. Healthcare Provider Reporting Requirements

The New Jersey Administrative Code NJAC 8:57 stipulates that healthcare providers report (by telephone, by confidential fax, or in writing) all cases of giardiasis to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the healthcare provider requesting the laboratory examination is located. The report shall contain the name of the disease; date of illness onset; name, age, date of birth, race, ethnicity, home address, and telephone number of the person they are reporting. Additionally, the name, address, institution, and telephone number of the reporting official and other information as may be required by NJDOH concerning a specific disease should be reported.

D. Health Officer Reporting and Follow-Up Responsibilities

The New Jersey Administrative Code NJAC 8:57 stipulates that each local health officer must report the occurrence of any case of giardiasis within 24 hours of receiving a report from a laboratory or healthcare provider to the NJDOH. A report must be filed electronically over the internet using the confidential and secure CDRSS.

5 CASE INVESTIGATION

A. Forms

It is the health officer's responsibility to investigate the case by interviewing the patient and others who may be able to provide pertinent information about the case patient's illness. Some of the information required in CDRSS can be obtained from the patient's healthcare provider or the medical record. Much of the information on exposure must be obtained from the case as it not likely in the medical record. To obtain relevant information please use the *Giardiasis Case Report Worksheet* available at:

http://nj.gov/health/cd/documents/topics/giardiasis/giardia_worksheet.pdf

- NJDOH recommends interviewing the patient and asking about exposure history (food, travel, activities), using the incubation period range for giardiasis (3-25 days). Specifically, focus on the period beginning a minimum of 3 days before the symptoms onset date back to no more than 25 days before onset.
- If possible, record any restaurants at which the patient ate, including food item(s) such as unwashed, raw or uncooked food and date(s) consumed.
- Ask questions about travel history and outdoor activities to help identify other potential exposure sources during the incubation period.

Communicable Disease Service Manual

- Ask questions about water supply and whether the patient drank untreated water, because giardiasis may be acquired through consumption of untreated water.
- Ask questions regarding household/close contacts, pets, or other animal contact. Determine whether the patient attends or works at a daycare facility and/or is a food handler. Food handlers should be excluded from handling food until 24 hours after symptoms resolve. These questions are necessary to examine the patient's risk of having acquired the illness from, or potential for transmitting it to, these contacts. These questions are also useful to classify a case as sporadic or part of a household or institutional cluster or outbreak.
- In a case of an outbreak (see section 7.2 for definition), immediately notify the NJDOH by telephone at 609.826.5964 during business hours and 609.392.2020 after business hours and on weekends and holidays.
- After speaking with case patient and healthcare provider and completing the worksheet, enter all collected information into the Communicable Disease Reporting and Surveillance System (CDRSS).

B. Other Reporting/Investigation Issues

Once LHD completes its investigation and assigns a report status of "LHD CLOSED" in CDRSS, NJDOH will review the case. NJDOH will approve the case by changing the report status to "DHSS APPROVED". At this time, the case will be submitted to CDC and the case will be locked for editing. If additional information is received after a case has been placed in "DHSS APPROVED" you will need to contact NJDOH to reopen the case. This should be done only if the additional information changes the case status of the report.

Institution of disease control measures is an integral part of the case investigation. It is the health officer's responsibility to understand and, if necessary, institute the control guidelines listed below in section 6, Controlling Further Spread.

6 CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

1. Minimum Period of Isolation of Patient

Food handlers with giardiasis are to be excluded from food handling duties until 24 hours after diarrhea has resolved. In outbreak situations, special precautions such as submission of additional stool specimens before returning to food handling duties may be warranted.

Children should not attend school until diarrhea has resolved.

Since *Giardia* can stay alive for almost an hour even in well-maintained pools, patients should not swim for 2 weeks after diarrhea has resolved.

2. Protection of Contacts

Food handlers who are contacts of a confirmed case, and who have diarrhea shall be considered the same as a case-patient and be excluded from food handling duties until 24 hours after diarrhea has resolved and be advised to maintain appropriate hand hygiene upon their return.

B. Managing Special Situations

1. Daycare

Since giardiasis is often transmitted person-to-person through fecal-oral transmission, it is extremely important to carefully follow cases of giardiasis in a daycare setting. General recommendations include the following:

- Children with giardiasis who have diarrhea should be excluded until their diarrhea has resolved.
- Children with giardiasis who have no diarrhea and are otherwise not ill may remain in the program.

Since most staff in daycare programs are considered food handlers, those with *Giardia* in their stools who are symptomatic must not prepare food or feed children until 24 hours after their diarrhea has resolved and be advised to maintain appropriate hand hygiene upon their return.

2. School

Since giardiasis is often transmitted person-to-person through fecal-oral transmission, it is important to carefully follow cases of giardiasis in a school setting. General recommendations include the following:

- Students or staff with giardiasis who have diarrhea should be excluded until their diarrhea has resolved.
- Students or staff with giardiasis who have no diarrhea and are not otherwise ill may remain in school.

Students or staff who handle food and have giardiasis infection and are symptomatic must not prepare food until 24 hours after their diarrhea has resolved and be advised to maintain appropriate hand hygiene upon their return.

3. 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 give 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 (See section 6A above).

In **residential facilities for the developmentally disabled**, staff and clients with giardiasis must refrain from handling or preparing food for other residents until 24 hours after their diarrhea has subsided and be advised to maintain appropriate hand hygiene upon their return.

In addition, staff members with giardiasis who are not food handlers should not work until their diarrhea has resolved.

If an outbreak is detected or suspected in a long-term care facility or community residential program, the facility must report the outbreak to its LHD. Facility management should also report any such outbreak to the Division of Health Facility Survey and Field Operations at 609-292-0412. (*This applies to Assisted Living Facilities, Assisted Living Programs, Comprehensive Personal Care Homes, Residential Health Care Facilities, and Adult and Pediatric Day Health Services Facilities ONLY.*)

7 OUTBREAK SITUATIONS

Reported Incidence Is Higher Than Usual/Outbreak Suspected

If the number of reported cases of giardiasis in a city/town is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle (such as recreational water, drinking water, food, or association with a daycare or institutional setting) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness including proper hand hygiene and sanitary disposal of feces. NJDOH staff can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several jurisdictions and therefore be difficult to identify at a local level.

8 PREVENTIVE MEASURES

Preventive Measures/Education

Educate families, personnel, and residents of institutions, especially adult personnel of daycare centers, in personal hygiene and prevention measures.

Hand washing with soap and water is preferred over hand sanitizer. Hand sanitizer is effective against trophozoites passed in the stool, but not against the cyst form that exists in the environment.

To avoid exposure and transmission, individuals should:

- Wash their hands thoroughly with soap and water frequently when ill with diarrhea, or when caring for someone with diarrhea, after using the toilet or helping someone use the toilet, after changing diapers (wash their own hands as well as the child's hands and dispose of diapers in a closed-lid garbage can), before eating or preparing food, after gardening, and after contact with animals or animal waste.
- Avoid swallowing recreational water, including pool or natural water.
- Avoid swimming while ill with diarrhea, and for at least two weeks after diarrhea resolves. Infected persons may continue to shed the parasite during this time. This measure is essential for children in diapers.

- Shower with soap and water before entering recreational water, including swimming pools and hot tubs. Wash thoroughly, especially rectal and genital areas, before entering swimming water, water parks, or other public bathing areas.
- Take children on frequent bathroom breaks and check diapers often.
- Change diapers in the bathroom or a diaper-changing area, not at pool or waterside.
- When hiking or camping, be aware of the risks of drinking water from streams or lakes. Do not drink untreated water from a surface water supply, such as a pond, lake, or stream. Although the water may appear to be clean, it may contain *Giardia* parasites, which cannot be seen without a microscope.
- If untreated water is all that is available there are several methods to disinfect water before drinking, rinsing uncooked foods, or brushing teeth such as boiling, use of chemicals, filters and ultraviolet light. Information on healthy drinking water can be found at <http://www.cdc.gov/healthywater/drinking/travel/index.html>.
- If your source of drinking water is a well or a private surface water supply, do not allow humans or animals to defecate (have bowel movements) near the water. Contact your local health department for advice on how keep your water supply safe. Also, some water filters can help to get rid of parasites from contaminated water.
- Avoid sexual practices that may involve direct contact with feces. Latex barrier protection should be emphasized as a way to prevent the spread of *Giardia* to sexual partners, as well as to prevent exposure to and transmission of other pathogens.

Additional Information

A Giardiasis FAQ can be obtained at NJDOH Web site at http://www.nj.gov/health/cd/documents/faq/giardiasis_faq.pdf.

References

- American Academy of Pediatrics 2015 Red Book: Report of the Committee on Infectious Diseases. Pickering LK, ed. 29th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2012.
- Centers for Disease Control and Prevention. Giardiasis Surveillance – United States, 2009-2010 *MMWR Morbidity and Mortality Weekly Report* September 7, 2012 / 61(SS05); 13-23
- Centers for Disease Control and Prevention. Parasites – *Giardia* Available at: <https://www.cdc.gov/parasites/giardia>. Accessed January 2018.
- Centers for Disease Control and Prevention. Drinking Water – available at <http://www.cdc.gov/healthywater/drinking/travel/index.html>. Accessed January 2018.
- Heymann David, ed. *Control of Communicable Diseases Manual*. 19th ed. Washington, DC: American Public Health Association; 2008.
- Utah Department of Public Health, Division of Disease Control and Prevention. *Giardiasis Disease Investigation Plan*; May 2015.