Giardiasis

Surveillance Protocol

Provider Responsibilities

1. Report all cases to your local health department within the timeframe indicated:

   Sporadic case of Giardiasis- should be reported within 72 hours of diagnosis. Because *Giardia* is easily spread it is recommended that cases be reported as soon as possible after diagnosis. Include the following information:

   a) Patient's name, date of birth, address and phone number
   b) Demographic information including race, sex, age, and ethnicity
   c) Clinical symptoms
   d) Laboratory results

   Outbreaks of Giardiasis- should be reported immediately (see definition of outbreaks in public health action section).

Laboratory Responsibilities

1. Report all positive *Giardia* tests to the local health department in the patient's county of residence within 72 hours of result. Send or fax a copy of the laboratory result to the local health department if not already reported by electronic laboratory reporting (ELR). Include the following information:

   a) Patient's name, date of birth, address and phone number
   b) Demographic information including race, sex, age, and ethnicity
   c) Physician name, address and phone number
   d) Laboratory results, normal values and interpretation

Local Health Responsibilities

1. Educate providers and the public about transmission and prevention of Giardiasis.

2. Educate providers and laboratories to report *Giardia* infections to the local health department in the patient's county of residence within 72 hours of diagnosis.

3. For investigation of sporadic cases:
   Initial report must be filed within 72 hours of first notification.

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a) Complete all sections of the WVEDSS Giardiasis Reporting Form. Use of the form will prompt a complete and appropriate investigation to include:

- Exposure to animals, especially deer, elk, beaver, or other wildlife contaminating water supplies
- Consumption of untreated water
- Attendance or employment at a day care or child care facility
- Exposure to a toddler

b) Identify other cases, including probable cases (symptomatic persons who are epidemiologically linked to a culture-confirmed case), and investigate completely as in above.

c) Enter case investigation and laboratory information from the form into the WVEDSS system. Keep the form and laboratory information and store according to your local records retention policies. Mail or fax a copy of the laboratory report to the Division of Infectious Disease Epidemiology (DIDE) if it was not received by electronic laboratory reporting (ELR).

4. Institute appropriate control measures:

In child care centers:

- Emphasize improved sanitation and personal hygiene
- Emphasize hand hygiene by staff and children, especially after toilet use or handling of soiled diapers
- Identify and treat all symptomatic children, child care workers and family members
- Cases with diarrhea should be excluded from the child care center until they become asymptomatic

In institutional settings:

- Emphasize hand hygiene by staff, especially after handling soiled linens
- Identify and treat all symptomatic residents, and workers
- Symptomatic residents should be cohorted to the extent possible
- In addition to standard precautions, contact precautions for the duration of illness should be used for incontinent residents

Giardiasis

Surveillance Protocol

For investigation of a suspected outbreak:

Outbreak is defined as greater than expected numbers of cases reported during a certain time frame –OR- 2 or more epidemiologically linked cases from 2 or more households

Foodborne disease outbreak is defined as two or more persons who experience a similar illness after ingestion of a common food. Please note two exceptions: one case of botulism or chemical poisoning constitutes an outbreak.

Waterborne disease outbreak is defined as two or more persons who experience a similar illness after consumption or use of water intended for drinking. Outbreaks in association with recreational water may include exposure to or unintentional ingestion of water. Please note that a single case of chemical poisoning also constitutes an outbreak.

1. Obtain case histories for preliminary reports as in sporadic cases above. Focus on possible common source exposures.

2. Verify the diagnosis

3. Gather a 72 hour food history and water ingested and recreational water contact for 2 weeks prior to onset of illness

4. Contact DIDE and notify of suspected outbreak

5. Consult outbreak investigation protocol for complete instructions on investigation of an outbreak.
http://www.dhhr.wv.gov/oeps/disease/ob/Documents/protocols/community-outbreak-protocol.pdf

Epidemiologic investigations may be necessary in cases involving common source, daycare centers, or institutions. Consult with an epidemiologist at DIDE if a common source outbreak is suspected.

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State Health Responsibilities

1. Prompt and complete reporting of Giardiasis cases to the Centers for Disease Control and Prevention (CDC) through WVEDSS.
2. Provide technical expertise and consultation regarding surveillance, investigation, control measures and prevention of Giardiasis.
3. Assist local health jurisdictions in obtaining the knowledge and resources necessary for investigation of a Giardiasis outbreak.
4. Notify CDC of an outbreak involving cases from other states or suspected to be associated with a product distributed in multiple states.
5. Summarize surveillance data for cases of Giardiasis on an annual basis.

Disease Control Objectives

Reduce the incidence of secondary cases of Giardiasis by:

- Appropriate investigation of outbreaks and clusters to identify and remove any common source of disease.
- Identification and exclusion of cases and probable cases (symptomatic epi-linked contacts) from high-risk settings such as daycare and food preparation.
- Identify cases which might be a source of infection for other persons (e.g. a diapered child, daycare attendee or foodhandler) and prevent further transmission.
- To identify transmission sources of public health concern (e.g. a restaurant or a contaminated public water supply) and stop transmission from such sources.

Disease Prevention Objectives

Reduce the incidence of Giardiasis by:

- Education of the general public about the risks of drinking untreated surface water, including private supplies or water from streams or lakes while camping or hiking.
- Education of the public about handwashing before eating, after handling raw meat, after contact with animals, and after use of the toilet.

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Disease Surveillance Objectives

- Determine the incidence of Giardiasis in West Virginia
- Identify demographic characteristics of persons with Giardiasis
- Identify behavioral risk factors associated with Giardiasis

Public Health Significance

Giardiasis has a worldwide distribution and infects both domestic and wild animals such as cats, dogs, cattle, deer and beavers. Giardiasis occurs sporadically in West Virginia as well as worldwide, although outbreaks are known to occur. It is the most common intestinal parasitic infection of humans identified in the United States and worldwide. Children are infected more frequently than adults. Prevalence is higher in areas of poor sanitation and in institutions with children who are not toilet trained, especially daycare centers. Surveys conducted in the United States have demonstrated prevalence rates of Giardia in stool specimens that range from 1% to 30%, depending on location and age. Cases occur more commonly in the summer and fall months.

Public water supplies that are exposed to human or animal feces should be treated with a combination of filtration, chlorination and stringent maintenance of distribution systems. Persons at greatest risk of exposure to infection are children in day care, their close contacts, men who have sex with men, backpackers and campers (via ingestion of unfiltered, untreated drinking water), travelers to disease-endemic areas, and persons drinking water from shallow wells. Community-wide outbreaks may result from contaminated water supplies, such as lakes and swimming pools. Handwashing after toilet use and before handling food or eating is an important preventive measure, especially in the day care setting.

Clinical Description

Disease spectrum varies from asymptomatic to severe diarrhea and malabsorption. Symptoms typically include watery, foul-smelling diarrhea that may persist for weeks, and is often intermittent. Diarrhea is often accompanied by abdominal cramps and a "bloated" feeling, with excess gas. Because fat absorption is impaired, stools may have a higher than usual fat content (steatorrhea) and thus tend to float. In fact, most infections are symptomatic. The nature of acquired immunity (if any) is uncertain.

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Some people with regular exposure may develop some degree of resistance to illness. Treatment failure is not uncommon (~10% of the time) but is not indicative of resistance by the parasite. A repeat course of the same medication may be indicated.

Etiologic Agent

Giardia lamblia is a protozoan parasite that has two forms; cyst and trophozoite. The cyst in infectious form can remain viable in the environment for weeks/months. After the ingestion of cysts, they stay in the small intestine. They become trophozoites which are then capable of being motile, feeding and reproducing. Infected persons can shed both trophozoites and cysts in stool.

Reservoir

Humans and wild and domestic animals are reservoirs. Contaminated water supplies can also harbor these organisms.

Mode of Transmission

The principal mode of transmission of giardiasis is person-to-person. Persons become infected by fecal-oral transfer of cysts from the feces of an infected individual, especially in institutions and daycare centers. Transmission can also occur person to person through certain types of sexual contact (e.g. oral-anal contact). Another major source of infection is consumption of fecally contaminated water, such as stream/lake waters and swimming pools that are open to contamination by human and animal feces. Eating food contaminated by an infected food handler could be a source, but this has been rarely documented. Although possible, risk of infection from pets (e.g. cats and dogs) is small.

Incubation Period

3-25 days (variable); median 7-10 days

Period of Communicability

Persons are infectious as long as cysts are being shed, which may be months. The typical infectious period is poorly defined and may be intermittent. Asymptomatic infected persons tend to be much more infectious than persons with diarrhea.

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Outbreak Recognition

An outbreak is defined as greater than expected numbers of cases reported during a certain time frame or when clustered cases of *Giardia* are reported. Giardiasis most commonly occurs from July to October, during the summer months when recreational bathing is prevalent and private drinking water supplies become low or scarce. Outbreak recognition and investigation requires timely and complete epidemiological investigation (risk factors, food history, history of exposure to animals, etc.) paired with timely and complete laboratory investigation. During outbreaks, institute an epidemiological investigation of clustered cases in an area or institution to determine the source of the infection and mode of transmission.

Laboratory Testing

Microscopic examination of stool preserved in formalin for evidence of the parasite is routinely used for diagnosis of *Giardia* infection. Enzyme-linked immunosorbent assay (ELISA), direct fluorescent antibody (DFA) methods to detect antigens, and polymerase chain reaction (PCR) testing are also available.

Case Definition

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.

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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.

Preventive Interventions

1. Wash hands well with soap and water after using the toilet, cleaning the toilet, after changing diapers, and after handling soiled towels or linens.
2. Wash hands well with soap and water before, during, and after preparing food.
3. In a daycare or institutional setting, dispose of feces soiled material in a sanitary manner.
4. Avoid swallowing recreational water. Protect others by not swimming, if you are experiencing diarrhea (especially children in diapers).
5. When hiking or camping, avoid drinking untreated water from shallow wells, streams, lakes, rivers, ponds etc. Bringing water to a full, rolling boil for 1 minute is sufficient to kill *Giardia*. Several commercial filters are available that remove *Giardia* cysts.
6. Do not consume untreated ice or drinking water when traveling in areas where the water supply might be unsafe.
7. Avoid sexual practices that may involve direct contact with feces.

Treatment

Supportive care as needed for dehydration and electrolyte abnormalities. Metronidazole (Flagyl) and tinidazole are the medications of choice. Alternatives include quinacrine, furazolidone and nitazoxanide. Paromomycin can be used during pregnancy, but when disease is mild, delaying treatment until after delivery is recommended. Drug resistance and relapses may occur. As a general rule, only symptomatic infections are treated.

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Surveillance Indicators

1. Proportion of investigations with complete demographic information.
2. Proportion of investigations with complete clinical severity information.
3. Proportion of cases with complete exposure information including:
    a) Consumption of untreated/unchlorinated water
    b) Outdoor recreational activities (i.e. hiking, camping, swimming)
    c) Other recreational water exposure
    d) Travel to another state or country

References

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4. Procedures to Investigate Waterborne Illness. 2nd ed. International Association for Food Protection; 1996: 9-15.

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