Cyclosporiasis

Signs and Symptoms	• Watery diarrhea, anorexia, abdominal cramps, fatigue, weight loss, and body aches; may be fever, vomiting; symptoms more severe with immunocompromise • Severity ranges from asymptomatic to prolonged relapsing diarrhea	
Incubation	1 week (range 1-14 days)	
Case classification	**Clinical criteria**: Illness of varying severity, typically watery diarrhea; can be loss of appetite, weight loss, abdominal cramps, fatigue	
	Confirmed: Clinically consistent with detection of *Cyclospora* organisms or DNA in stool or intestinal specimen	**Probable:** Clinically consistent with epi link to a confirmed case
Differential diagnosis	Cryptosporidiosis, amebiasis, bacterial enteritis, celiac disease, Crohn disease, giardiasis, inflammatory bowel disease, irritable bowel syndrome, lactose intolerance	
Treatment	Appropriate antibiotics (trimethoprim-sulfamethoxazole)	
Duration	Symptoms may relapse. Diarrhea can last months if immunocompromised.	
Exposure	Humans are reservoir but shed organisms are not immediately infectious. Transmission through food (produce – berries, herbs, greens, imported products), water	
Laboratory testing	Local health jurisdiction (LHJ) and Communicable Disease Epidemiology (CDE) arrange testing for individual cases, particularly for suspected outbreaks • Washington State Public Health Laboratories will confirm all positive results and can test during outbreak as requested • **Best specimens**: **stool** with no recent antacid, antidiarrheal or laxative medication *Specimen shipping (Section 4):* Keep stool at ambient temperature, ship according to PHL requirements https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu • Specimen Collection and Submission Instructions https://doh.wa.gov/sites/default/files/legacy/Documents/5240//SCSI-Cyclo-Cysto-V1.pdf	
Public health actions **URGENT**	Immediately report to CDE 206-418-5500 or 877-539-4344 any suspected cyclosporiasis outbreaks • Interview with emphasis on exposures during travel and on risk foods • Initiate trace-back if commercial product implicated • Exclude from sensitive settings while having diarrhea • Refer symptomatic contacts sharing potential exposures to healthcare providers • If a known group has a suspected outbreak, instruct their healthcare providers to specifically request Cyclospora testing for symptomatic persons *Infection Control:* standard precautions with contact precautions for diapered or incontinent persons	

Cyclosporiasis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify sources of transmission (e.g., a commercial product) and to prevent further transmission from such sources.
2. To better characterize the epidemiology of this organism.

B. Legal Reporting Requirements

1. Health care providers and Health care facilities: notifiable to **local health jurisdiction** within 3 business days.
2. Laboratories: notifiable to **local health jurisdiction** within 2 business days, submission on request – specimen associated with positive result, within 2 business days
3. Local health jurisdictions: notifiable to the Washington State Department of Health Communicable Disease Epidemiology (CDE) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigation Responsibilities

1. If a source of infection is identified, prevent further spread from the source.
2. Investigate and report all cases to CDE. Complete the cyclosporiasis case report form http://www.doh.wa.gov/Portals/1/Documents/5100/210-023-ReportForm-Cyclo.pdf and enter the data into the Washington Disease Reporting System (WDRS).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Cyclosporiasis is caused by a unicellular parasite (*Cyclospora cayetanensis*) which infects the small bowel.

B. Description of Illness

The clinical syndrome consists of watery diarrhea (~6 stools/day), nausea, anorexia, abdominal cramping, bloating, marked fatigue and weight loss; low-grade fever occurs in 25–50% of persons. Diarrhea in immunocompetent persons can be prolonged but is usually self-limited; mean duration of organism shedding was 23 days in a study of infected Peruvian children. For immunocompromised persons, diarrhea can last for months. Asymptomatic infections can occur.

C. Cyclosporiasis in Washington State

Requirements for the reporting of cyclosporiasis were instituted in December of 2000. Since then, Department of Health has received 0–23 case reports per year. Recent increases in cases may reflect improved laboratory detection through culture independent testing. Washington cases have mainly been exposed during foreign travel but some cases occur in residents who have not traveled outside the state.

D. Reservoir

The primary reservoir appears to be infected humans. It is not known whether animals can be infected and serve as a source of infection for humans.

E. Modes of Transmission

Cyclospora oocysts excreted in the feces are not immediately infectious, but can become infectious under sufficient environmental conditions. Transmission appears to occur primarily after ingestion of contaminated food or water. National outbreaks have been associated with pre-packaged vegetable trays, salad mix, fresh herbs (basil, cilantro), snow peas, and bagged salad mix. An outbreak in 2020 linked to bagged salad resulted in 701 cases in other states. In 2021, restaurant-associated outbreaks were linked to leafy greens. Reported outbreaks and locally acquired cases have a seasonal pattern, with warmer months predominating. See:

https://www.cdc.gov/cyclosporiasis/
https://www.cdc.gov/cyclosporiasis/php/publications/

F. Incubation Period

The incubation period ranges from 1–14 days with an average of 1 week.

G. Period of Communicability

Cyclospora oocysts are not infectious at the time of excretion in the feces; therefore, direct person-to-person fecal-oral transmission does not occur. However, indirect transmission can occur if excreted oocysts contaminate the environment and sufficient conditions allow them to become infectious (i.e., sporulate). The organism is resistant to routine chlorination levels in drinking water; chlorine or iodine treatment is not effective.

H. Treatment

Trimethoprim-sulfamethoxazole is most commonly used to treat cyclosporiasis. In patients who are not treated, illness can be protracted, with remitting and relapsing symptoms.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

An illness of variable severity caused by the protozoan parasite *Cyclospora cayetanensis.* The most common symptom is watery diarrhea. Other symptoms include loss of appetite, weight loss, abdominal cramping/bloating, nausea, body aches and fatigue. Vomiting and low grade fever may be noted.

B. Laboratory Criteria for Diagnosis

Laboratory-confirmed cyclosporiasis shall be defined as the detection of *Cyclospora* organisms or DNA in stool, intestinal fluid/aspirate, or intestinal biopsy specimens.

C. Case Definition (2010)

Confirmed: a case that meets the clinical description and at least one of the criteria for laboratory confirmation described above.

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

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

Diagnosis is made by identification of the 8–10 µm size oocysts, about twice the size of *Cryptosporidium parvum,* in wet mount under phase contrast microscopy. If *Cyclospora* is suspected, a modified acid-fast stain can be used to increase the likelihood of detection. Other techniques that increase the sensitivity of detection of *Cyclospora* oocysts are ultraviolet fluorescence microscopy and a modified safranin stain; however these methods may not be available in most laboratories. Health care providers considering the diagnosis of *Cyclospora* infection should alert the laboratory so that specific staining procedures can be performed. Molecular diagnostic tests such as PCR can detect the organism's DNA in stool, intestinal fluid/aspirate, or intestinal biopsy specimens.

B. Tests Available at DOH Public Health Laboratories (PHL)

PHL can identify *Cyclospora* oocysts in stool. If *Cyclospora* is suspected, PHL should be informed so that appropriate staining with a modified acid-fast stain can be used. Consult with Communicable Disease Epidemiology prior to submitting specimens.

Note that PHL require all clinical specimens have two patient identifiers, a name **and** a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date. For details see: https://doh.wa.gov/sites/default/files/legacy/Documents/5240//SCSI-Cyclo-Cysto-V1.pdf

C. Specimen Collection

To maximize the likelihood of detecting *Cyclospora*, three stool specimens should be collected over a 10-day period. Specimens must be collected on separate days using the Para-Pak ULTRA ECOFIX™ collection kit. Fill collection kit with stool specimen until the fluid level reaches the red line marked on the outside of the tube. Ensure the stool and fluid is well mixed and lid is secured. Specimen can be stored and shipped at room temperature. Please indicate requests for *Cyclospora* testing. Specimens need to be shipped according to PHL requirements: https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu

5. ROUTINE CASE INVESTIGATION

A. Manage the Case

1. Hospitalized patients should be cared for using standard precautions. As a general rule, contact precautions should be used for diapered or incontinent persons.
2. Cases should be educated about proper hand hygiene particularly after using the toilet and before preparing food.
3. Work and child care restrictions: As a general rule, persons should not work as food handlers or attend child care while they have diarrhea.

B. Identify Potential Sources of Infection

Ask the patient about potential exposures in the 1–14 days prior to onset, including:

1. Travel outside the United States, particularly tropical or semitropical regions,
2. Eating berries, fresh herbs, lettuce, and other produce, particularly imported products,
3. Consuming unboiled water, particularly during travel, and
4. Recreational water exposure, particularly during travel.

C. Identify and Manage Contacts/Others Exposed

1. Contacts (including those sharing potential exposure) with symptoms compatible with cyclosporiasis should be referred to a health care provider for evaluation.
2. Contacts are generally at low risk for acquiring infection from a case since oocysts excreted in the stool are not infectious.
3. If you suspect an outbreak of cyclosporiasis, call Communicable Disease Epidemiology (206-418-5500).

D. Environmental Evaluation/Measures

1. Generally, no environmental evaluation is needed for sporadic cases
2. Outbreaks: A traceback investigation should be performed if a commercial food product has been implicated.

6. ROUTINE PREVENTION

A. Immunization Recommendations: None

B. Prevention Recommendations

- Produce should be washed thoroughly before it is eaten; however, this practice does not eliminate the risk of *Cyclospora*.
- When traveling in risk areas, particularly tropical and semitropical regions, persons should drink only boiled water (chlorine or iodine treatment is not effective) and eat only cooked hot foods or produce (fruits and vegetables) they peel themselves.
- Persons should avoid swallowing recreational water, especially when traveling.

ACKNOWLEDGEMENTS

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UPDATES

March 2008: In Section 1C, the guideline for timeliness of initiating an investigation was removed.

January 2010: Section 3 was updated to reflect changes in national case classifications. Asymptomatic persons are no longer notifiable as cases under the changed classification.

January 2011: The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.

March 2014: Case definition was updated to clarify molecular diagnostic testing. Sections 5 and 6 format has been reorganized without change in content.

February 2017: Front page was added.

February 2022: Routine update; more details about national outbreaks added (Section 2E).

December 2022: For WAC revision combined provider and facility reporting requirement, updated laboratory submission (Section 1B)

December 2023: For 2024 WAC revision updated laboratory submission.

June 2024: CDC links updated