

Cyclosporiasis

BASIC EPIDEMIOLOGY

Infectious Agent

Cyclospora cayetanensis, a sporulating, protozoan parasite. *Cyclospora* is an oocyst, i.e., it is protected by an outer wall making it resistant to disinfectants. It also has surface adhesions that allow it to adhere to various surfaces, e.g., leafy greens, berries, etc.

Transmission

Transmission occurs through ingestion of oocysts in contaminated food or water.

Incubation Period

Usually 7 days (range 2-14 days)

Communicability

Cyclospora oocysts are not infectious in freshly excreted stool, making person-to-person transmission unlikely. However, indirect transmission can occur if excreted oocysts contaminate the environment and sufficient time/conditions allow them to become infectious (i.e., sporulate).

Clinical Illness

Watery diarrhea is the predominant symptom. Other symptoms include loss of appetite, weight loss, cramping, bloating, increased gas, nausea and fatigue. Less common symptoms include vomiting, body aches and a low-grade fever. Asymptomatic infections can occur, particularly where cyclosporiasis is endemic.

DEFINITIONS

Clinical Case Definition

An illness of variable severity caused by the protozoan parasite *Cyclospora cayetanensis*. The most common symptom is watery diarrhea. Other common symptoms include loss of appetite, weight loss, abdominal cramps, bloating, nausea, increased flatulence, and fatigue. Vomiting, body aches, and low-grade fever also may be noted. Relapses and asymptomatic infections can occur.

Laboratory Confirmation

- Detection of *Cyclospora*:
 - Organisms by microscopic examination in stool, intestinal fluid/aspirate, or intestinal biopsy specimens **OR**
 - DNA (by PCR) in stool, intestinal fluid/aspirate or intestinal biopsy specimens

Case Classifications

- **Confirmed:** A laboratory-confirmed case with clinical compatibility
- **Probable:** A clinically compatible case that is epidemiologically linked to a confirmed case

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should promptly investigate all reports of cyclosporiasis. Investigations should include an interview of the case or a surrogate to get a detailed exposure history.

Please use the ***Cyclospora* National Hypothesis Generating Questionnaire (CNHGQ)**

investigation form available on the DSHS website: <http://www.dshs.state.tx.us/idcu/investigation/>

Case Investigation Checklist

- Confirm laboratory results meet the case definition.
- Review medical records or speak to an infection preventionist or healthcare provider to verify case definition, identify possible risk factors and describe course of illness.
- Interview the case to get detailed food history and risk factor information.
 - Use the **Cyclospora National Hypothesis Generating Questionnaire (CNHGQ)** investigation form to record information from the interview.
 - If the case is not available or is a child, conduct the interview with a surrogate who would have the most reliable information on the case, such as a parent or guardian.
 - Provide education to the case or his/her surrogate about effective hand washing, food safety practices, and ways to prevent transmission to others. See Prevention and Control Measures.
- Fax completed forms to DSHS EAIDU at 512-776-7616 or email securely to FoodborneTexas@dshs.texas.gov.
 - For lost to follow-up (LTF) cases, please complete as much information obtained from medical/laboratory records (e.g., demographics, symptomology, onset date, etc.) on investigation form and fax/email securely to DSHS EAIDU noting case is LTF.
- Identify whether there is a public health concern: persons should not work as food handlers, child-care or health care workers, or attend child-care if they have diarrhea. See Exclusions.
- If case is part of an outbreak or cluster, see Managing Special Situations section.
- All confirmed and probable case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Prevention and Control Measures

- Routine hand washing with soap and warm water, especially:
 - Before preparing, handling or eating any food.
 - After going to the bathroom.
 - After changing a diaper.
 - After caring for someone with diarrhea.
- Thoroughly wash fruits and vegetables; however, this practice does not eliminate the risk of *Cyclospora*.
- When traveling internationally to areas with poor sanitary conditions:
 - Drink bottled water or water that has been boiled for at least 1 minute.
 - Don't drink fountain drinks or drinks with ice.
 - Don't eat fruits or vegetables that you don't peel yourself.
 - Avoid uncooked foods.
- Avoid swallowing recreational water, especially when traveling.

Exclusions

School/child-care: No exclusions are specified for cyclosporiasis but the standard exclusion for diarrhea or fever applies:

Children with diarrhea should be excluded from school/child-care until they are free from diarrhea for 24 hours without the use of diarrhea suppressing medications.

- Children with a fever from any infection should be excluded from school/child-care for at least 24 hours after fever has subsided without the use of fever suppressing medications.

Food Employee: No exclusions are specified for cyclosporiasis but the standard exclusion for vomiting or diarrhea applies:

- Food employees are to be excluded if symptomatic with vomiting or diarrhea until:
 - Asymptomatic for at least 24 hours without the use of diarrhea suppressing medications
- OR
- Medical documentation is provided stating that symptoms are from a noninfectious condition.

Please see Guide to Excluding and Restricting Food Employees in Appendix A.

MANAGING SPECIAL SITUATIONS

Outbreaks

If an outbreak is suspected, notify the DSHS Emerging and Acute Infectious Disease Unit (EAIDU) at **(512) 776-7676**, or email an EAIDU foodborne epidemiologist at FoodborneTexas@dshs.texas.gov.

The local/regional health department should:

- Interview all cases suspected as being part of the outbreak or cluster.
- Request medical records for any case in your jurisdiction that died, is lost to follow-up, was too ill to be interviewed, or for whom there are no appropriate surrogates to interview.
- Prepare a line list of cases in your jurisdiction. Minimal information needed for the line list might include patient name or other identifier, DSHS or laboratory specimen identification number, specimen source, date of specimen collection, date of birth, county of residence, date of onset (if known), symptoms, underlying conditions, treatments and outcome of case, and risky foods eaten, foods eaten leading up to illness, or other risky exposures, such as animal contact and travel, reported by the case or surrogate.

Line list example:

ID	Name	Age	Sex	Ethnicity	Onset	Symptoms	Food	Animal	Notes
1	NT	34	F	W/N	2/4/16	Bl. D, F	Chicken, eggs	Dog	Dog food
2	PR	2	M	U/U	1/30/16	V,D,F	Chicken, spinach	None	Brother ill

- If the outbreak was reported in association with an apparent common local event (e.g., party, conference, rodeo), a restaurant/caterer/home, or other possible local exposure (e.g., pet store, camp), contact hospitals in your jurisdiction to alert them to the possibility of additional cases.
- Work with any implicated facilities to ensure staff and students/residents/volunteers get hand hygiene education and review hygiene and sanitary practices currently in place, including:
 - Policies on, and adherence to, hand hygiene.
 - Storage and preparation of food.
 - Procedures for changing diapers and toilet training.
 - Procedures for environmental cleaning.
- If the outbreak was reported in association with a local event (e.g., party, conference, rodeo), a restaurant/caterer, or other possible local exposure where food was served, try to obtain as much information about the case's food history at the event, the menu of the event, and the source of the food served.
- Recommend that anyone displaying symptoms seeks medical attention from a healthcare

provider.

- Restrict individuals from handling food, engaging in child-care, healthcare work, or attending child-care, if they are symptomatic. See Exclusions in Case Investigation section.
- Enter outbreak into NORS at the conclusion of the outbreak investigation. See Reporting and Data Entry Requirements section.

Note:

- If a food item or food establishment is implicated, an EAIDU foodborne epidemiologist will notify appropriate state/and/or federal partner agencies regarding the outbreak and the possibility of a common contaminated food source for the cases.
- Decisions about testing implicated food items can be made after consultation with an EAIDU foodborne epidemiologist.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School, Child-Care Facility, and General Public Reporting Requirements

Confirmed and probable cases are required to be reported **within 1 week** to the local or regional health department or by faxing the disease reporting form to the Texas Department of State Health Services (DSHS), Emerging and Acute Infectious Disease Unit (EAIDU) at **(512) 776-7676**.

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **confirmed and probable** cases.
 - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
 - A case should not be counted as a new case if laboratory results were reported within 365 days of a previously reported infection in the same individual, unless additional information is available indicating a separate infection.
 - A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completing the investigation.
- Fax completed CNHGQ to DSHS EAIDU at **512-776-7676** or email securely to FoodborneTexas@dshs.texas.gov.

When an outbreak is being investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDU at **512- 776-7676**.
- Enter outbreak information into the **National Outbreak Reporting System (NORS)** at the conclusion of the outbreak investigation.
 - For NORS reporting, the definition of an outbreak is two or more cases of similar illness associated with a common exposure.
 - The following should be reported to NORS:
 - Foodborne disease, waterborne disease, and enteric illness outbreaks with person-to-person, animal contact, environmental contact, or an indeterminate route of transmission.
 - Enter outbreaks into NORS online reporting system at <https://wwwn.cdc.gov/nors/login.aspx>
 - Forms, training materials, and other resources are available at <http://www.cdc.gov/nors/>
- To request a NORS account, please email FoodborneTexas@dshs.texas.gov.
 - Please put in Subject Line: NORS User Account Request
 - Information needed from requestor: name, email address, and agency name
 - After an account has been created a reply email will be sent with a username, password, and instructions for logging in.

LABORATORY PROCEDURES

CLINICAL SPECIMENS:

Testing for cyclosporiasis is widely available from most private laboratories. Specimens are encouraged to be submitted to the DSHS laboratory for confirmation.

Specimen Collection

- Submit a stool specimen in a sterile, leak-proof container.
 - Required volume: Stool 15 g solid or 15mL liquid.
- Fresh stool that cannot be received by the lab in less than 5 hours should be placed in formalin and PVA immediately.

Submission Form

- Use DSHS Laboratory G-2B form for specimen submission.
- Make sure the patient's name, date of birth and/or other identifier match exactly what is written on the transport tubes and on the G-2B form.
- Fill in the date of collection and select the appropriate test.
- If submitting as part of an outbreak investigation, check "Outbreak association" and write in name of outbreak.
- Payor source:
 - Check "IDEAS" to avoid bill for submitter.

Specimen Shipping

Transport temperature: May be shipped at ambient temperature or 2-8°C.

- Ship specimens via overnight delivery and email the tracking number to an EAIDU foodborne epidemiologist
- DO NOT mail on a Friday, or a state or federal holiday unless approved by an EAIDU foodborne epidemiologist and confirmed by DSHS Laboratory.
- Must be received on cold packs or wet ice.
- Ship specimens to:

Laboratory Services Section, MC-
1947 Texas Department of State
Health Services Attn. Walter
Douglass (512) 776-7569 1100 West
49th Street
Austin, TX 78756-3199

Causes for Rejection:

- Specimen not in correct transport medium.
- Missing or discrepant information on form/specimen.
- Unpreserved specimen received greater than 5 hours after collection.
- Transport media was expired.
- Specimen too old.

FOOD SAMPLES AND ENVIRONMENTAL SWABS:

Testing of food samples for *Cyclospora cayetanensis* is available at the DSHS laboratory. Decisions about testing implicated food items can be made after consultation with an EAIDU foodborne epidemiologist.

General policy

- The DSHS lab will only test food samples from facilities implicated in a suspected

- outbreak (not associated with single cases).
- In outbreaks, the DSHS lab will not test food samples unless a pathogen has been identified in a clinical specimen.
 - Food samples must be **collected by a registered sanitarian**.

At this time, environmental testing is not available for *Cyclospora*. For further questions, please contact an EAIDU foodborne epidemiologist to discuss further.

REVISION HISTORY

December 2021

- Updated Definitions, Managing Special Situations, and Laboratory Procedures sections

March 2021

- Entire section