

Cryptosporidiosis

BASIC EPIDEMIOLOGY

Infectious Agent

Cryptosporidium species, a coccidian, protozoan parasite. *Cryptosporidium hominus* and *Cryptosporidium parvum* are the 2 species most often associated with human illness.

Transmission

Transmission occurs through the fecal-oral route. This is predominantly through the ingestion of sporulated oocysts, which are the infectious stage of the parasite, in contaminated or untreated water sources. Oocysts are shed periodically in high quantities in the stool of infected individuals and are highly resistant to environmental conditions and chemical disinfectants. Transmission can also occur through person-to-person transmission, through contact with an infected animal or contaminated surface, and via the ingestion of contaminated food. A wide array of animals can act as reservoirs and sources of infection without displaying symptoms of illness, including fish, reptiles, birds, and small (rodents, cats, dogs) and large mammals (cattle and sheep).

Incubation Period

Variable; usually 1 to 12 days, with an average of 7 days

Communicability

Oocysts may be shed immediately upon symptom onset and for up to 2 weeks after symptoms resolve. Immunocompromised individuals may shed oocysts for months. *Cryptosporidium* oocysts are infectious immediately upon excretion. Outside of the body the oocysts can remain infectious for 2-6 months and even longer when in a moist environment.

Clinical Illness

Frequent, non-bloody, watery diarrhea lasting 6 to 14 days (less than 30 days) is the predominant symptom. Fever, abdominal cramps, fatigue, vomiting, anorexia and weight loss may also be seen. Asymptomatic infections are common.

Severity

Usually self-limited in healthy individuals. Pregnant women and people with weakened immune systems are at higher risk of severe complications. Rare instances of disseminated infection may occur in immunocompromised individuals. Malnutrition and significant weight loss in immunocompromised individuals with chronic diarrhea can contribute to death.

DEFINITIONS

Clinical Case Definition

A gastrointestinal illness characterized by diarrhea and one or more of the following: diarrhea duration of 72 hours or more, abdominal cramping, vomiting, or anorexia.

Laboratory Confirmation

- Detection of *Cryptosporidium* organisms or DNA in stool, intestinal fluid, tissue samples, biopsy specimens, or other biological sample by certain laboratory methods with a high positive predictive value (PPV), e.g., DFA, PCR, EIA, or light microscopy of stained specimen.

Case Classifications

- **Confirmed:** A case that is laboratory confirmed
- **Probable:** A person must meet one of the following:
 - A case with *Cryptosporidium* antigen detected by a screening test method such as, the immunochromatographic card/rapid card test or a laboratory test of unknown method, **OR**
 - A clinically compatible case that is epidemiologically linked to a confirmed case by one of the following means:
 - Household or other close contact to a lab-confirmed case with onset of symptoms within 1 month (before or after), **OR**
 - Exposure to an outbreak at a body of water or water facility involving at least 2 lab-confirmed cases and onset of symptoms within one month (before or after) of one or more of these cases.

Note: 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

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

It is recommended that local and regional health departments investigate all reported cases of cryptosporidiosis to identify potential sources of infection. Sporadic cases of cryptosporidiosis do not require an investigation form be sent to DSHS EAIDU unless they are identified as part of a multi-jurisdictional cluster or outbreak. Any case associated with a cluster or outbreak should be interviewed.

Case Investigation Checklist

- Confirm laboratory results meet the case definition.
- Review medical records or speak to an infection preventionist/healthcare provider to verify case definition, identify possible risk factors, and describe course of illness.
- If time and resources allow or the case is part of an outbreak or cluster, interview the case to identify potential sources of infection. Ask about possible exposures in the 2 to 12 days before onset, including:
 - Contact with any acquaintances or household member with a similar illness.
 - Attendance or work at a child-care facility by the case or a household member.
 - Source(s) of drinking water, including water at home and work, as well as streams, lakes or other untreated sources.
 - Recreational water exposures: lakes, rivers, swimming pools, water slides, etc. Obtain the date and location of exposure.
 - Travel outside the area. Obtain travel dates and locations visited.

- Contact with livestock and other animals.
- Consumption of high-risk foods (e.g., raw milk or other unpasteurized products).
- Note: 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 regarding modes of transmission and ways to prevent transmission to others. See Prevention and Control Measures.
- 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 as long as they have diarrhea. See Exclusions.
- 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.
 - After any contact with animals or their living areas.
- Swimming at recreational water venues (pools, interactive fountains, lakes, ocean):
 - Prevent transmission to others by not swimming when experiencing diarrhea (this is essential for children in diapers).
 - If diagnosed with cryptosporidiosis, swimming should be avoided for at least 2 weeks after diarrhea stops.
 - Symptomatic individuals should shower prior to entering the water.
 - Children should be washed thoroughly (especially their bottoms) with soap and water after they use the toilet or their diapers are changed and before they enter the water.
 - Children should be taken on frequent bathroom breaks and have their diapers checked often.
 - Change diapers in the bathroom, not near the poolside or water source.
- Contact with animals:
 - Avoid or minimize any contact with the feces of all animals, especially young animals.
 - Wear disposable gloves when cleaning up animal feces and always wash hands when finished.
 - Wash hands after any contact with any animals or their living areas.
- Outside:
 - Wash hands after gardening, even if wearing gloves.
- Immunocompromised persons/at risk populations - cryptosporidiosis can become a life-threatening disease for immunocompromised persons:
 - Avoid close contact with any person or animal that has cryptosporidiosis.
 - Do not handle animal feces.
- Avoid sexual practices that can cause oral exposure to stool (e.g., oral-anal contact).

Exclusions

School/child-care: No exclusions are specified for cryptosporidiosis 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 cryptosporidiosis 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**.

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, 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
- 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.
- When a public recreational or public water source (such as public pools, water parks or lake) is implicated as a source of transmission, educate staff on appropriate measures of environmental cleaning and disinfection.
 - Recommend the disinfection and remediation guidelines at the CDC website: <http://www.cdc.gov/healthywater/swimming/pools/disinfection-remediation-pools-hot-tubs.html>
 - When a recreational water source has been implicated in an outbreak, recommend hyperchlorination be used for disinfection and remediation: <http://www.cdc.gov/healthywater/pdf/swimming/pools/hyperchlorination-to-kill-cryptosporidium.pdf>
- 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, the lead epidemiologist for foodborne diseases will notify the DSHS Division of Regulatory Services about the outbreak and the possibility of a common contaminated food source for the cases.

REPORTING AND DATA ENTRY REQUIREMENTS

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

Confirmed, probable and clinically suspected cases are required to be reported **within 1 week** to the local or regional health department or 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.
- If investigation forms are requested, they may be faxed to 512-776-7616 or emailed securely to an EAIDU foodborne epidemiologist at FOODBORNETEXAS@dshs.texas.gov.

When an outbreak is 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.
 - Outbreaks as indicated above with patients in the same household.
 - Enter outbreaks into NORS online reporting system at <https://www.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.state.tx.us
 - 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 cryptosporidiosis is widely available from most private laboratories. Specimens should not be submitted to the DSHS laboratory unless approved by EAIDU. Submission of specimens to the DSHS laboratory will be considered during outbreak investigations. Contact an EAIDU foodborne epidemiologist to discuss further.

Specimen Collection

- Submit a stool specimen in a sterile, leak-proof container.
 - Required volume: Stool 15g solid or 15mL liquid.
- Fresh stool that cannot be received by the lab in less than 5 hours should be placed in formalin 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.
- DO NOT mail on a Friday, or state holiday, unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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.

FOOD SAMPLES AND ENVIRONMENTAL SWABS:

Testing of food and environmental swabs for *Cryptosporidium* is NOT available at the DSHS laboratory.

REVISION HISTORY

March 2021

- Minor edits