



Cryptosporidiosis

Disease Plan

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Last updated: 08/06/2021, by Kacy Nowak.

Questions about this disease plan?

Contact the Utah Department of Health Bureau of Epidemiology: 801-538-6191.

✓ CRITICAL CLINICIAN INFORMATION

Clinical Evidence
<p>Signs/Symptoms</p> <ul style="list-style-type: none"> • The most common symptom includes watery and profuse diarrhea for ≥ 72 hours. • Other signs and symptoms include stomach cramps, anorexia, nausea, vomiting, malaise, and low-grade fever. • Severe symptoms including severe diarrhea, malnutrition, and death can occur among immunodeficient patients.
<p>Period of Communicability</p> <ul style="list-style-type: none"> • Cryptosporidiosis is communicable as long as the infected person excretes <i>Cryptosporidium</i> oocysts. • Oocysts typically appear in the stool when symptoms begin and can shed in the stool for several weeks after symptoms resolve. • Oocysts can remain infectious outside of the body for 2-6 months in moist environments.
<p>Incubation Period</p> <ul style="list-style-type: none"> • Range 1-14 days (average 7 days).
<p>Mode of Transmission</p> <ul style="list-style-type: none"> • Fecal-oral transmission.
Laboratory Testing
<p>Type of Lab Test/Timing of Specimen Collection</p> <ul style="list-style-type: none"> • Detection of oocysts using the direct immunofluorescent antibody (DFA) method is the current test of choice. • Can also be identified using intestinal biopsy tissue and fecal smears, enzyme immunoassay (EIA) and polymerase chain reaction (PCR), and rapid testing. • Since infectious oocysts are excreted intermittently, at least three samples collected on separate days should be examined before the test can be considered negative.
<p>Type of Specimens</p> <ul style="list-style-type: none"> • Stool, intestinal tissue.
Treatment Recommendations
<p>Type of Treatment</p> <ul style="list-style-type: none"> • Most healthy patients can recover without treatment. • Nitazoxanide (Alinia) is preferred therapy for those over one year old when treatment is required.
<p>Prophylaxis</p> <ul style="list-style-type: none"> • None.
Contact Management
<p>Isolation of Case</p> <ul style="list-style-type: none"> • Infected food handlers must be excluded from work until diarrhea is resolved. • Children should not attend school until they no longer are experiencing diarrhea. • Infected persons should not use recreational waters while ill and for two weeks after symptoms resolve.
<p>Quarantine of Contacts</p> <ul style="list-style-type: none"> • Contacts who have diarrhea and also handle food should be considered the same as a case, and isolation measures should be handled in the same way. • Otherwise, no quarantine restrictions apply.
Infection Control Procedures
<ul style="list-style-type: none"> • Enteric precautions.

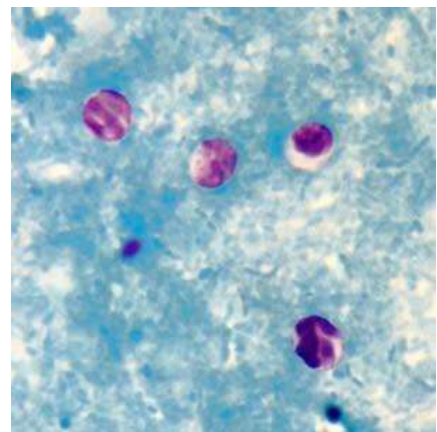
✓ WHY IS CRYPTOSPORIDIOSIS IMPORTANT TO PUBLIC HEALTH?

Cryptosporidium is a parasite that is found worldwide and in every region of the United States (U.S.). When ingested, this parasite causes the diarrheal illness cryptosporidiosis (often called "crypto"). It is estimated that 748,000 cases occur each year in the U.S., though only a fraction of those are reported. On average, Utah has around 150 cryptosporidiosis reported cases per year, but in 2007, Utah experienced one of the largest cryptosporidiosis outbreaks in U.S. history with over 3,500 cases. Cryptosporidiosis is easily transmissible and can result in severe illness. Correct diagnosis, early detection of cases, and interview of ill persons is crucial in identifying sources of illness and preventing future cases and outbreaks.

✓ DISEASE AND EPIDEMIOLOGY

Clinical Description

The most common symptom of cryptosporidiosis is profuse and watery diarrhea. Other signs and symptoms include diarrhea with a duration of ≥ 72 hours, loss of appetite, weight loss, stomach cramps, nausea, vomiting, malaise, and low-grade fever. Symptoms may be continuous or intermittent. In immunocompetent people (including children), the illness is usually self-limiting, lasting one to two weeks; however, in immunodeficient patients, especially those with AIDS, chronic infection may cause severe diarrhea, malnutrition, dehydration, and possibly death. Although infection is usually limited to the gastrointestinal tract, extraintestinal infection has also been observed in the biliary and respiratory tracts. Asymptomatic infections are common and serve as a source of infection for others.



Cryptosporidium oocysts (CDC Photo, 2010)

Causative Agent

Cryptosporidiosis is an infection caused by the protozoan parasite *Cryptosporidium*. Infectious oocysts (the state in the parasite's life cycle when the organism is surrounded by a protective shell) of *Cryptosporidium* can survive for months in soil under cool, dark conditions and for up to a year in low-turbidity water. *Cryptosporidium* is highly resistant to chemical agents (including chlorine), more so than the majority of protozoa. Infectivity appears to cease when oocysts are frozen, freeze-dried, boiled, or heated to at least 140° Fahrenheit or above for 5 to 10 minutes.

Differential Diagnosis

The differential diagnosis for cryptosporidiosis includes giardiasis, Cystoisopora infection, microsporidiosis, cyclosporiasis, *Clostridium difficile* infection, salmonellosis, shigellosis, campylobacteriosis, *Mycobacterium avium* complex infection, and viral infections (e.g., cytomegalovirus, rotavirus, norovirus, and adenovirus).

Laboratory Identification

Diagnosis is generally made by the identification of oocysts in fecal smears. Organisms can also be identified in intestinal biopsy tissue. Routine laboratory examination of stool for ova and parasites might not include testing for *Cryptosporidium* species, so testing for the organism should be specifically requested. The direct immunofluorescent antibody (DFA) method for detection of oocysts in stool is the current test of choice. In addition, enzyme immunoassay (EIA) and polymerase chain reaction (PCR) testing are available and are more sensitive. Rapid tests have also become more common. Since the infectious oocysts are excreted from the body intermittently, at least three stool samples collected on separate days should be examined before the test can be considered negative.

UPHL: The Utah Public Health Laboratory (UPHL) does not test for *Cryptosporidium*. Local laboratories test for *Cryptosporidium* using either an EIA, microscopy-based, or rapid test.

NOTE: Laboratory results do not always indicate which test method was used. Consequently, a positive *Cryptosporidium* result using an EIA test may look the same as a positive result using a rapid test (e.g., *Cryptosporidium* Ag.).

Treatment

Most healthy patients can recover from cryptosporidiosis without treatment. However, when treatment is required, nitazoxanide (Alinia) is the preferred therapy for those over one year of age.

For patients co-infected with HIV, highly active antiretroviral therapy (HAART) should be quickly initiated. Large and sustained doses of nitazoxanide, as well as combination therapies such as paromomycin with azithromycin, have also been studied and have shown some effect.

Case Fatality

Deaths due to cryptosporidiosis are rare. However, in elderly or immunocompromised patients, cryptosporidiosis may cause chronic, debilitating illness and may contribute to death.

Reservoir

Humans, cattle, and domestic animals are reservoirs, and may excrete large numbers of oocysts. *Cryptosporidium* infects more than 45 vertebrate species including birds, fish, mammals, and reptiles.

Transmission

In order for infection to occur, the susceptible host must ingest water or other materials contaminated with *Cryptosporidium* oocysts. Fecal-oral is the main route of transmission and includes:

1. **Person-to-person:** Contact with infected persons (e.g., those in the same household or child care facility, or certain types of sexual contact, such as oral-anal contact).
2. **Animal-to-person:** Contact with an infected animal's feces.
3. **Waterborne:** Ingesting fecally contaminated recreational water (rivers, lakes, swimming pools, splash pads) or inadequately treated water.

Foodborne: Eating food contaminated by animals or food handlers, drinking unpasteurized milk or juice, or eating raw foods rinsed off with contaminated water.

Infected animals and human beings can excrete up to a billion oocysts per infection. This excretion can continue for several weeks after symptoms resolve. One episode of diarrhea can contaminate an entire pool. Outbreaks have been reported in daycare centers, and have also been associated with drinking water, recreational water use, and consumption of contaminated beverages.

The infectious dose is very low and differs between species. It is estimated that the infectious dose for *Cryptosporidium parvum* is 132 oocysts and between 10 and 83 oocysts for *Cryptosporidium hominis*. Immunologic health and previous exposure may influence a host's susceptibility. Oocysts are hardy and can remain infective and survive in the environment for months. They are resistant to concentrations of chlorine and other disinfectants commonly used for drinking water treatment.

Susceptibility

Anyone can get cryptosporidiosis. Groups at increased risk for infection include animal handlers, travelers, men who have sex with men, children younger than two years of age, and close personal contacts of infected individuals (families, daycare, and healthcare workers). Peak infection rates occur in the young and decrease progressively with age. Scientists have not yet established whether long-term immunity is conferred by infection.

Incubation Period

Symptoms appear 1-14 days after exposure; the average incubation period is 7 days.

Period of Communicability

The disease is communicable for as long as the infected person excretes *Cryptosporidium* oocysts. Oocysts typically appear in the stool when symptoms begin and continue to be excreted for several weeks after symptoms resolve. Oocysts may remain infectious outside the body for 2-6 months in a moist environment.

Epidemiology

Cryptosporidiosis has a worldwide distribution, and *Cryptosporidium* has been found on every continent except Antarctica. It is more common in countries with poor sanitary conditions and increased crowding. The global prevalence of *Cryptosporidium* infection is about 7.6%, however, infection prevalence is significantly higher in developing regions of the world (closer to between 30-60%). Cryptosporidiosis is among the most common causes of persistent diarrhea in patients with AIDS in the U.S., but it has become less of a problem since the introduction of anti-retroviral therapy.

Large outbreaks traced to contaminated drinking water have been reported, including an outbreak in Milwaukee in 1993 that reportedly affected 400,000 people. Localized outbreaks have been associated with public drinking water, contaminated swimming pools, lakes and ponds, raw milk, and drinking unpasteurized cider made from apples contaminated with cow manure. It is estimated that 50% of dairy calves shed oocysts and that the parasite is present on more than 90% of dairy farms.

Between 2016 and 2020, there have been between 125 and 198 (median of 170) confirmed and probable cases of cryptosporidiosis reported each year in Utah, with cases peaking in the summer and early fall months. Common exposures reported by Utah residents include recreational water exposure, animal exposure, and international travel. In 2007, Utah

experienced one of the largest cryptosporidiosis outbreaks in the U.S. with over 3,500 cases that were largely associated with treated recreational water exposure. This outbreak illustrates how easily transmissible cryptosporidiosis is and why prevention and control measures are crucial.

✓ PUBLIC HEALTH CONTROL MEASURES

Public Health Responsibility

- Investigate all cases of disease and fill out and submit appropriate disease investigation forms.
- Provide education to the general public, community partners (e.g., pool operators and child care centers), clinicians, and first responders regarding disease transmission and prevention.
- Identify cases and sources to prevent further transmission.
- Identify clusters or outbreaks of this disease and determine the source.

Prevention

Personal Preventive Measures/Education

To avoid exposure and transmission, individuals should:

- Wash their hands thoroughly with soap and water for at least 20 seconds:
 - 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, especially cattle. Due to its hard, protective shell, *Cryptosporidium* is not killed by alcohol gels and hand sanitizers.
- Keep *Cryptosporidium* organisms and other germs out of pools, hot tubs, splash pads, lakes, etc. by taking the following steps:
 - Avoid swallowing recreational water, including pool or bath water. Routine chlorination does not eliminate the parasite.
 - 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 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 a pool or waterside.
- Avoid drinking raw milk, other unpasteurized dairy products, or unpasteurized apple cider.
- Wash raw fruits and vegetables thoroughly with clean, treated water.

- Avoid drinking unboiled water while traveling in developing countries or when the water quality is unknown. Bringing water to a full, rolling boil for one minute is sufficient to kill *Cryptosporidium*.
- Adhere to local advisories to boil water.

Cryptosporidiosis is also transmissible via oral-anal sexual contact. Latex barrier protection (e.g., dental dam) may prevent the spread of *Cryptosporidium* to a case's sexual partners and may prevent exposure to and transmission of other fecal-oral pathogens.

Recommendations for Immunocompromised Persons

The risk of acquiring cryptosporidiosis in a non-outbreak setting is uncertain and current data are inadequate to make recommendations regarding drinking tap water under normal conditions. Severity of illness is correlated with the level of an individual's immunosuppression. Immunodeficient people may wish to consider the following actions which may reduce the risk of waterborne cryptosporidiosis, in addition to the actions listed above for the general public:

- For all water consumption purposes, boil water at least three minutes before using (for elevations above 8,500 feet, boil for five minutes). This includes water used for brushing teeth, making ice cubes, washing food, etc. As an alternative to boiling water, some commercially available home water filtration units are considered effective against *Cryptosporidium*. While using bottled water might appear as an alternative, it is not routinely tested for *Cryptosporidium* and caution should be exercised when selecting a product. Commercially-bottled drinking water labeled as reverse osmosis treated, distilled, filtered through an absolute one micron or smaller filter, or "one micron absolute" has been processed by a method effective against *Cryptosporidium*. Contact the bottler for details on processing. (The decision to implement the preceding suggestions should be made in conjunction with a health care provider).
- Consider the use of a home water filtration system with a very fine filter (absolute pore size of one micron or smaller). Such filters include: reverse-osmosis filters, filters labeled as "absolute" one-micron filters, and those labeled as meeting National Sanitation Foundation (NSF) standard #53 or #58 for cyst removal.
- When in restaurants or other public facilities, avoid tap water, ice cubes, and any other beverage that is not canned or bottled.
- Make sure that eating and cooking materials washed in tap water are thoroughly dried before they are used.
- Avoid swallowing pool or bath water, or water from other recreational water sources. Routine chlorination does not eliminate the parasite.
- Avoid fecal contact.

Chemoprophylaxis

None.

Vaccine

None.

Isolation and Quarantine Requirements

Isolation: Food handlers with cryptosporidiosis must be excluded from work until diarrhea has resolved. Children should not attend school as long as they have diarrhea. Persons diagnosed with cryptosporidiosis, including pool employees, should not use recreational waters while ill and for two weeks after symptoms resolve.

NOTE: A food handler is any person directly preparing or handling food. This can include a patient care or childcare provider.

Hospital: Standard and contact precautions.

Quarantine: Contacts who have diarrhea and are food-handling facility employees shall be considered the same as a case and shall be handled in the same manner. No restrictions otherwise.

NOTE: In certain circumstances, cases, ill contacts, and/or asymptomatic contacts who are food handlers may be required to have negative stool samples prior to returning to work. The local health department will decide which cases and/or contacts will need negative stool samples prior to returning to work, and whether one or two negative samples is necessary. If a case or contact has been treated with an antimicrobial agent, the stool specimen should not be collected until at least 48 hours after cessation of therapy. If two negative stool samples are determined to be necessary, they should be taken at least 24 hours apart.

CASE INVESTIGATION

Reporting

Report any illness to public health authorities that meets any of the following criteria:

1. Any person who has a positive laboratory test for any *Cryptosporidium* species. These tests may include any of the following:
 - a. Detection of *Cryptosporidium* organisms in stool, intestinal fluid, tissue samples, or biopsy specimens,
 - b. Detection of *Cryptosporidium* antigen by immunodiagnostic methods, or
 - c. Detection of *Cryptosporidium*-specific nucleic acid in stool, intestinal fluid, tissue samples, or biopsy specimens.
2. Any person with diarrhea and/or one or more symptoms of abdominal cramping, diarrhea \geq 72 hours duration, vomiting or anorexia, and who is either a contact of a confirmed case of cryptosporidiosis, or a member of a risk group as defined by the public health authorities during an outbreak.
3. A person whose healthcare record contains a diagnosis of cryptosporidiosis.

Other recommended reporting procedures:

- All cases of cryptosporidiosis should be reported.
- Reporting should be ongoing and routine.
- Frequency of reporting should follow the state health department's routine schedule (in Utah, within three working days of identification).

Reporting Table:

Table of criteria to determine whether a case should be reported to public health authorities.

Criterion	Disease or condition subtype	
<i>Clinical Evidence</i>		
Diarrhea	O	
Abdominal cramps	O	
Vomiting	O	
Diarrhea of ≥ 72 hours duration	O	
Anorexia	O	
Healthcare record contains a diagnosis of cryptosporidiosis		S
<i>Laboratory Evidence</i>		
<i>Cryptosporidium</i> organisms in stool, intestinal fluid, tissue samples or biopsy specimens		S
<i>Cryptosporidium</i> antigens in stool or intestinal fluid		S
<i>Cryptosporidium</i> -specific nucleic acid in stool, intestinal fluid, tissue samples or biopsy specimens		S
<i>Epidemiologic Evidence</i>		
Contact of a confirmed case of cryptosporidiosis	O	
Member of a risk group as defined by the public health authorities during an outbreak	O	

Notes:

S = This criterion alone is Sufficient to identify a case for reporting.

O = At least one of these "O" (Optional) criteria in each category (e.g., clinical evidence and laboratory evidence) in the same column is required to identify a case for reporting.

Case Definition

Cryptosporidiosis (2018)

Clinical Description

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

Laboratory Criteria

Confirmed: Evidence 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.,

- Direct fluorescent antibody [DFA] test,
- Polymerase chain reaction [PCR],
- Enzyme immunoassay [EIA], OR
- Light microscopy of stained specimen.

Probable: The detection of *Cryptosporidium* antigen by a screening test method, such as immunochromatographic card/rapid card test; or a laboratory test of unknown method.

Case Classification

Confirmed: A case that is diagnosed with *Cryptosporidium* spp. infection based on laboratory testing using a method listed in the confirmed criteria.

Probable:

- A case with supportive laboratory test results for *Cryptosporidia* spp. infection using a method listed in the probable laboratory criteria. When the diagnostic test method on a laboratory test result for cryptosporidiosis cannot be determined, the case can only be classified as probable.

OR

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

Comment: Persons who have a diarrheal illness and are epidemiologically linked to a probable case because that individual was only diagnosed with cryptosporidiosis by an immunochromatographic card/rapid test/or unknown test method cannot be classified as probable cases. These epi-links can be considered suspect cases only.

Classification Table

Criteria for defining cases of cryptosporidiosis.

Criterion	Confirmed	Probable	
<i>Clinical Evidence</i>			
Diarrhea			N
Diarrhea of ≥ 72 hours duration			O
Abdominal cramps			O
Vomiting			O
Anorexia			O
<i>Laboratory Evidence</i>			
Detection of <i>Cryptosporidium</i> by direct fluorescent antibody [DFA] test	O		
Detection of <i>Cryptosporidium</i> -specific nucleic acid by polymerase chain reaction [PCR]	O		
Detection of <i>Cryptosporidium</i> by enzyme immunoassay [EIA]	O		
Demonstration of <i>Cryptosporidium</i> by microscopy and staining	O		
Immunochromatographic card/rapid card test		O	
Unknown laboratory test method/type		O	
<i>Epidemiologic Evidence</i>			
Contact of a confirmed case of cryptosporidiosis			N

Notes:

N = All "N" criteria in the same column are Necessary to classify a case.

O = At least one of these "O" (Optional) criteria in each category (e.g., clinical evidence and laboratory evidence) in the same column—is required to classify a case.

Case Investigation Process

All probable and confirmed cases should be interviewed with the cryptosporidiosis case report form. Food handlers should be restricted from work until diarrhea has resolved. Children with diarrhea, especially those in diapers, should be excluded from child care and school settings until diarrhea has resolved. Negative stool specimens may be required. Pool employees that regularly enter the water, such as lifeguards and swimming instructors, with diarrhea should have their duties modified so that they do not enter the pool while ill, and for two weeks after diarrhea has resolved. People with diarrhea related to cryptosporidiosis should be advised to avoid swimming in public recreational water (e.g., pools, fountains, splash pads, lakes) while ill and for two weeks after diarrhea has resolved.

Outbreaks

CDC defines a food-borne outbreak as, "an incident in which two or more persons experience a similar illness resulting from the ingestion of a common food." In order to confirm an outbreak of cryptosporidiosis, there must be at least two ill persons and detection of the *Cryptosporidium* organism or antigen in stool or small-bowel biopsy. In waterborne outbreaks attributable to contaminated drinking water, advisories to boil water may be issued to prevent cases until appropriate water treatment is restored. *Cryptosporidium* has become one of the most common causes of waterborne disease. Because the parasite is chlorine-resistant and can survive for days in pools, chlorinated pools do not protect against transmission.

In the event of a *Cryptosporidium* outbreak, early detection and rapid response are crucial. Early detection should be dependent upon exceeding a threshold of expected cases, rather than identifying the source of transmission. This threshold varies depending upon geographic location and seasonality. If the threshold has been exceeded or an outbreak has been detected, the occurrence needs to be reported and control measures may need to be implemented.

Contaminated Swimming Pools

Fecal accidents in pools pose a risk to other swimmers. A pool contaminated with *Cryptosporidium* species may need to be closed for disinfection, or in some cases drained and refilled. Ultraviolet radiation is effective in inactivating *Cryptosporidium* and is commonly used in Utah swimming pools.

For additional information regarding responding to fecal accidents in pools, see:

<https://www.cdc.gov/healthywater/swimming/pdf/fecal-incident-response-guidelines.pdf>

Identifying Case Contacts

Contacts of cryptosporidiosis cases may include household contacts, daycare and school attendees and workers, and pool employees and swimmers. These contacts may be identified through an interview of the case-patient or physician notes. More information about management of case contacts are listed in the "Case Contact Management" section below.

Case Contact Management

Daycare

Since cryptosporidiosis may be transmitted from person-to-person through fecal-oral transmission, it is important to follow-up on cases of cryptosporidiosis in a daycare setting carefully. General recommendations include:

- Children with cryptosporidiosis who have diarrhea should be excluded until their diarrhea is resolved.
- Children with cryptosporidiosis who have no diarrhea and are not otherwise ill may be excluded or may remain in the program, if special precautions are taken.
- Since most staff in childcare programs are considered food handlers, those with cryptosporidiosis in their stools (symptomatic or not) can remain on site, but must not prepare food or feed children until their diarrhea has resolved. Negative stool specimens may be required.

School

Since cryptosporidiosis may be transmitted from person-to-person through fecal-oral transmission, it is important to follow up on cases of cryptosporidiosis in a school setting carefully. General recommendations include:

- Students or staff with cryptosporidiosis who have diarrhea should be excluded until their diarrhea is resolved.
- Students or staff with cryptosporidiosis who do not handle food, have no diarrhea or mild diarrhea, and are not otherwise sick, may remain in school at the discretion of school administrators and local public health authorities, if special precautions are taken.
- Students or staff who handle food and have cryptosporidiosis must not prepare food until their diarrhea has resolved. Negative stool specimens may be required.

Swimmers and Pool Employees

Since cryptosporidiosis may be transmitted from person-to-person through fecal-oral transmission, it is important to follow up on cases of cryptosporidiosis in a pool setting carefully. General recommendations include:

- Swimmers and pool employees that regularly enter the water should take a cleansing shower before entering a pool.
- Parents of young swimmers should not change diapers at poolside.
- Swimmers and pool employees that regularly enter the water, such as lifeguards and swimming instructors, should not enter a pool while ill and in the two weeks after diarrhea has resolved.
- Pool employees that regularly enter the water may remain at work, but it is recommended their duties be modified to ensure they do not enter the pool while ill and in the two weeks after diarrhea has resolved.

Community Residential Programs

Actions taken in response to a case of cryptosporidiosis 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 cryptosporidiosis should be placed on standard (including enteric) precautions until their symptoms subside. Staff members who provide 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. In addition, staff members with cryptosporidiosis who are not food handlers should not work until their diarrhea has resolved.

In residential facilities for the developmentally disabled, staff and clients with cryptosporidiosis must refrain from handling or preparing food for other residents until their diarrhea has subsided. Negative stool specimens may be required. In addition, staff members with cryptosporidiosis who are not food handlers should consider not working until their diarrhea has resolved.

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VERSION CONTROL

V.11.14: CSTE reporting criteria, case definition, and case classification swim lanes included.

V.03.15: "Why is Cryptosporidiosis Important to Public Health" section added. Symptoms and illness duration updated in "Clinical Description" section. "Laboratory Identification" updated to include recent changes in general laboratory practices for *Cryptosporidium* and information regarding laboratory tests in Utah. "Treatment" updated to include options for patients with HIV. More comprehensive list of reservoirs listed in "Reservoir" section. "Transmission" updated to include examples and infectious dose. "Epidemiology" section updated to include Utah trends. Prevention measures and recommendations updated and reorganized. Isolation requirements updated to include children. "Case Investigation Process" restricts additional high-risk settings. "Outbreaks" section updated with information regarding early detection and outbreak criteria. "Contaminated Swimming Pools" section added. "Identify Case Contacts" section updated and separated from "Case Contact Management." "Acknowledgements," "Version Control," and "Minimum Data Set" sections added.

V.05.15: Reworded the "Case Investigation Process" section and included recommendations for "Swimmers and Pool Employees" in the "Case Contact Management" section.

V.08.21: Added Critical Clinician Information and Electronic Laboratory Reporting Processing Rules sections. Updated annual case frequency data in the "Why is Cryptosporidiosis Important to Public Health" and "Disease and Epidemiology" sections to represent more current data. Updated the Cryptosporidiosis Case Definition to the most recent definition (2018) on the CSTE website. Removed outdated table from the "Disease and Epidemiology" section that discussed *Cryptosporidium* test types for Utah laboratories. Updated CDC swimming pool fecal accident response link.

✓ UT-NEDSS/EpiTrax Minimum/Required Fields by Tab

Demographic

- Last Name
- First Name
- Street Number
- Street Name
- City
- State
- County
- Zip Code
- Date of Birth
- Area Code
- Phone Number
- Birth Gender
- Ethnicity
- Race

Clinical

- Disease
- Onset Date
- Date Diagnosed
- Visit Type
 - (if inpatient) Did Cryptosporidiosis cause hospitalization?
- Died
 - (if yes) Date of Death
 - (if yes) Did Cryptosporidiosis cause Death?
- Diagnostic Facility

Laboratory

- Lab Name
- Lab Test Date
- Collection Date
- Specimen Source
- Test Type
- Organism
- Test Result
- Accession Number

Epidemiological

- Food Handler
 - Name of facility where patient handled food
 - Location
 - Did the patient work while ill?
 - Important information including dates

- Healthcare Worker
 - Name of healthcare facility
 - Location
 - Did the patient work while ill?
 - Important information including dates
- Group Living
 - Name of the facility
 - Location
 - Did the patient work/attend while ill?
 - Important information including dates
- Day Care Association
 - Name of the childcare facility
 - Location
 - Did the patient work/attend while ill?
 - Important information including dates
- Pool employee (lifeguard, swim instructor)
 - Facility name
- Occupation
- Imported From
- Risk Factors
- Risk Factor Notes

Investigation

- Date 14 days before disease onset:
- Date 1 day before disease onset:
- Did the patient travel outside the USA during the exposure period?
- During exposure period, did patient visit/swim/play/wade/work in any type of pool (e.g. public, private, home, kiddie/inflatable)?
- During exposure period, did patient visit/swim/play/wade/work in any natural water (e.g. lake, river, reservoir, pond, stream, hot spring, ocean)?
- During exposure period, did patient visit/swim/play/wade/work in a water park, splash pad/park, fountain or any other interactive water feature?

- During exposure period, did patient visit/swim/play/wade/work in a hot tub/spa, whirlpool or Jacuzzi?
- During exposure period, did patient visit/swim/play/wade/work in any sprinklers?
- During exposure period, did patient visit/swim/play/wade/work in any other irrigation/secondary water (e.g., canal)?
- During exposure period, did patient visit/swim/play/wade/work in any other recreational water (e.g., water play table in daycare)?
- Swim/play/work in any recreational water while ill or in the 2 weeks after diarrhea ended?
- If the answer to any of the previous eight water questions was yes, the following questions must be asked:
 - Name of water source/facility:
 - Address (including county/state):
 - Dates:
 - If date unknown, was it within 2-week exposure period?
 - Swim/play/work here in the 2 weeks after diarrhea ended?

Contacts

- Any contacts ill with similar symptoms? (if YES, fill out info in contact table)

Reporting

- Date first reported to public health

Administrative

- State Case Status (completed by UDOH)
- Outbreak Associated
- Outbreak Name

✓ ELECTRONIC LABORATORY REPORTING PROCESSING RULES

Rules for Entering Laboratory Test Results

The following rules describe how laboratory results reported to public health should be added to new or existing events in UT-NEDSS. These rules have been developed for the automated processing of electronic laboratory reports, although they apply to manual data entry, as well.

Test-Specific Rules

Test specific rules describe what test type and test result combinations are allowed to create new morbidity events in UT-NEDSS, and what test type and test result combinations are allowed to update existing events (morbidity or contact) in UT-NEDSS.

Test Type	Test Result	Create a New Event	Update an Existing Event
Acid fast stain	Positive	Yes	Yes
	Negative	No	Yes
	Other	No	Yes
	Equivocal	No	Yes
Antigen by EIA/ELISA	Positive	Yes	Yes
	Negative	No	Yes
	Other	No	Yes
	Equivocal	No	Yes
PCR/Amplification	Positive	Yes	Yes
	Negative	No	Yes
	Other	No	Yes
	Equivocal	No	Yes

Whitelist Rules

Whitelist rules describe how long an existing event can have new laboratory data appended to it. If a laboratory result falls outside the whitelist rules for an existing event, it should not be added to that event, and should be evaluated to determine if a new event (CMR) should be created.

Cryptosporidiosis Morbidity Whitelist Rule: If the specimen collection date of the laboratory result is 60 days or less after the last positive lab, the laboratory result should be added to the morbidity event.

Cryptosporidiosis Contact Whitelist Rule: If the specimen collection date of the laboratory result is 60 days or less after the event date of the contact event, the laboratory result should be added to the contact event.

Graylist Rule

We often receive laboratory results through ELR that cannot create cases, but can be useful if a case is created in the future. These laboratory results go to the graylist. The graylist rule describes how long an existing event can have an old laboratory result appended to it.

Cryptosporidiosis Graylist Rule: If the specimen collection date of the laboratory result is 30 days before to 7 days after the event date of the morbidity event, the laboratory result should be added to the morbidity event.

Other Electronic Laboratory Processing Rules

- If an existing event has a state case status of “not a case,” ELR will never add additional test results to that case. New labs will be evaluated to determine if a new CMR should be created.