

# Cryptosporidiosis

## Summary

*Cryptosporidium* species are protozoa that can cause diarrheal illness in humans. The protozoa have been found in a variety of hosts such as mammals, birds, and reptiles. Outbreaks have been associated with contamination of municipal water supplies and swimming pools, as well as petting zoos.

## Agent

- *Cryptosporidium hominis* and *parvum* are the protozoan species associated with human illness.

## Transmission

- Reservoir: Humans, cattle, and other domestic animals
- Mode of transmission: Fecal-oral including person-to-person, animal-to-person, waterborne and foodborne transmission
- Period of communicability: Infectious *Cryptosporidium* oocysts appear in the stool at onset of symptoms and continue to be excreted in the stool for several weeks after symptoms resolve. Oocysts can remain infective for 2-6 months outside the body in a moist environment.

## Clinical Disease

- Incubation period: Usually 7 days with a range of 1-12 days.
- Illness: The most common presenting symptom is frequent, non-bloody, watery diarrhea. Other signs and symptoms include abdominal cramps, fatigue, vomiting, anorexia, and weight loss. Fever and vomiting can be common in children. In immunocompetent persons, the diarrheal illness is self-limited; the infection can also be asymptomatic. In immunocompromised persons, particularly those with HIV, chronic severe diarrhea and disseminated infection can occur.

## Laboratory Diagnosis

- Finding oocysts on microscopic examination of fecal smears is diagnostic. Since shedding can be intermittent, at least 3 stool specimens collected on different days should be examined before a negative result is reported. Enzyme immunodiagnostic assay (EIA), fluorescein-conjugated monoclonal antibody, and polymerase chain reaction (PCR) techniques are useful for detecting oocysts in both stool and environmental samples.

## Treatment

- An FDA approved treatment for cryptosporidiosis is available. Nitazoxanide (Alinia®) is marketed in the United States as an anti-infective for treating diarrhea caused by *Cryptosporidium* species and *Giardia lamblia*. It is licensed for treatment of patients greater than 12 months of age with healthy immune systems. Go to <http://www.cdc.gov/crypto/treatment.html> for additional information on nitazoxanide and cryptosporidiosis.

## Surveillance

- Case Definition:  
*Laboratory criteria* - Demonstration of *Cryptosporidium* oocysts in stool; or demonstration of *Cryptosporidium* in intestinal fluid or small bowel biopsy specimens; or demonstration of *Cryptosporidium* antigen in stool by a specific immunodiagnostic or polymerase chain reaction (PCR) tests.  
*Confirmed* – a case that is laboratory confirmed.
- Reporting: **Report all suspected or confirmed cases of cryptosporidiosis to the Epidemiology and Response Division (ERD) at 505-827-0006.** Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation and health care provider.
- Case Investigation: Use the Cryptosporidium Investigation Form to complete your investigation. Investigation information should also be entered into NM-EDSS per established procedures.

## Control Measures

### 1. Case management

#### 1.1. Isolation:

1.1.a Exclude symptomatic persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. The person may be allowed to resume his/her usual duties when symptoms have resolved.

1.1.b For hospitalized patients, enteric precautions in the handling of feces, vomitus, and contaminated clothing and bed linen.

1.1.c People with a diagnosis of cryptosporidiosis should not use recreational waters for 2 weeks after symptoms resolve.

1.2. Prophylaxis: Not applicable.

1.3. Environmental remediation: Pools, waterparks, and interactive fountains associated with confirmed or probable cases should be hyperchlorinated per ERD recommendations. Report the name of the recreational water venue(s), along with the dates where a confirmed or probable case was swimming or playing, to ERD. This includes any water venue reported by the case from 2 weeks prior to symptom onset until 2 weeks after the last episode of diarrhea. ERD will coordinate hyperchlorination through the appropriate environmental health agency that regulates the recreational water venue.

### 2. Contact management

- 2.1. Microscopic examination of feces of household members and other suspected contacts, particularly if symptomatic.
- 2.2. Prophylaxis: Not applicable.
3. Prevention
  - 3.1. Emphasize good hand hygiene practices (i.e., proper handwashing after using the toilet, changing diapers, and before and after handling food).
  - 3.2. General guidelines for preventing foodborne illness include:
    - Thoroughly cook raw food from animal sources;
    - Wash raw vegetables;
    - Avoid unpasteurized dairy products;
    - Wash hands, knives, and cutting boards after handling uncooked foods.
  - 3.3. Immunization: Not applicable.

### **Management of Cryptosporidiosis in Child Care Centers**

- Exclude infected children and staff from child care facilities until diarrhea stops.
- Per child care licensing regulations, a center should notify parents or guardians in writing of a case of Cryptosporidiosis in the facility (Subsection D of 8.16.2.20 NMAC). See Appendix 8 for a template of a notification letter.

### **Control Measures for the Child Care Setting During an Outbreak of Cryptosporidiosis**

Cryptosporidiosis is a gastrointestinal illness caused by the parasite *Cryptosporidium*. This disease is a common cause of diarrhea in children, especially in child care settings. The hallmark symptom of cryptosporidiosis is watery diarrhea, which might be accompanied by stomach ache, nausea and vomiting, fever, and a general sick feeling. Healthy people who contract cryptosporidiosis almost always get better without any treatment but treatment is available by prescription. An unusual feature of cryptosporidiosis is that some people seem to get better only to have the diarrhea come back in a few days. Signs and symptoms can come and go for up to 30 days, but usually subside in 1 to 2 weeks. Cryptosporidiosis can cause severe illness in persons with compromised immune systems, such as those with HIV infection or those taking drugs that suppress the immune system.

Because *Cryptosporidium* is in feces, anything that gets contaminated by feces can potentially spread the parasite. As a result, the parasite can be spread directly from person to person, through contact with contaminated objects (e.g., toys), or by swallowing contaminated food or water (drinking and recreational). Cryptosporidiosis outbreaks in child care settings are most common during late summer/early fall (August/September) but might occur at any time. The spread of cryptosporidiosis is highest among young children who are not toilet trained and their caregivers (those who change diapers).

*Cryptosporidium* is resistant to chlorine disinfection so it is tougher to kill than most disease-causing organisms. The usual disinfectants, including most commonly used bleach solutions, have little effect on the *Cryptosporidium* parasite. An application of either hydrogen peroxide or ammonia seems to work best. Hydrogen peroxide is probably the best choice in the child care setting because ammonia has a strong odor and produces hazardous gas when mixed with bleach or other chlorinated solutions.

If an outbreak of cryptosporidiosis occurs in the child-care setting:

- Educate staff and parents
  - Inform all staff about the ongoing outbreak, the signs and symptoms of cryptosporidiosis, how it is transmitted, and control measures to be followed.
  - Inform parents about the ongoing outbreak, the signs and symptoms of cryptosporidiosis, how it is transmitted, outbreak control policies, and needed changes in hygiene and cleanliness.
    - Notify parents of children who have been in direct contact with a child or an adult caregiver with diarrhea. Parents should contact the child's health care provider if their child develops diarrhea.
  - Inform parents of children and staff about *Cryptosporidium*'s potential to cause severe disease in immunocompromised persons. Immunocompromised persons should consult their health care provider for further guidance.
- Exclude any child with diarrhea from the child care setting until the diarrhea has stopped.
  - Children who are infected with *Cryptosporidium* but who do not have diarrhea may be allowed to return.
  - Recently returning children can be grouped together in one classroom to minimize exposure to uninfected children.
  - Move adults with diarrhea to jobs that minimize opportunities for spreading disease (e.g., administrative work instead of food preparation).
- Terminate all water play or swimming activities (e.g., water tables, inflatable or rigid temporary swimming pools, public pool visits). This water can become contaminated and facilitate the spread of infections.
- Practice good hygiene. **Note:** The measures outlined should be routine but are especially important during outbreaks.
  - Enforce frequent hand washing and good hand washing technique for all children and adults.
    - **Note:** *Cryptosporidium* is not killed by alcohol gels and hand sanitizers so these materials are of little use in controlling an outbreak.
    - Use disposable towels.
    - Good hand washing means:
      - Wet your hands with clean running water and apply soap.

- Rub hands together to a lather and scrub all surfaces.
- Continue rubbing hands for 20 seconds (imagine singing “Happy Birthday” twice).
- Rinse hands well with water.
- Dry hands with paper towels or an air dryer. If possible, use a paper towel to turn off the faucet.
- For children:
  - Observe hand washing or assist when needed. Wash children’s hands when they arrive at the child care facility, after they use the toilet, after having their diapers changed, and before eating snacks or meals.
- For adults:
  - Wash hands after using the toilet, after helping a child use the toilet, after diapering a child, and before preparing or serving food. (**Note:** Where staffing permits, people who change diapers should not prepare or serve food).

- Improve diaper changing practice.
  - Separate diaper changing areas from children's play and food preparation areas.
  - Use disposable gloves and change them after each diaper change.
  - Use disposable paper over the diaper changing surfaces and change it after each diaper change.
  - Ensure children wear clothing over their diapers to reduce the opportunity for leakage.
  - Wash hands: both yours and the child's
- Disinfect surfaces and objects
  - No disinfectant is guaranteed to be completely effective against *Cryptosporidium*. However, hydrogen peroxide is usually effective.
    - Instead of a bleach solution, use a 3% (99% kill rate) or, if available, 6% (99.9% kill rate) concentration of hydrogen peroxide to soak contaminated surfaces for 20 minutes.
    - Ammonia can also be used (5% solution for 18 hours) but it has a strong odor and, if accidentally mixed with bleach or other chlorine-containing solutions, produces hazardous chlorine gas.
  - Disinfect bathrooms, diaper areas, and food preparation surfaces daily.
  - Disinfect toys, tabletops, and high chairs more frequently than usual (at least twice daily).
    - Dishwasher-safe toys can be disinfected in a commercial dishwasher that has a dry cycle or a final rinse that exceeds 113°F for 20 minutes or 122°F for 5 minutes or 162°F for 1 minute. Cloth toys may be washed and heat-dried on the highest clothes dryer heat setting for 30 minutes.
  - These are not routine measures, but may be necessary if an outbreak occurs, which is defined as 2 or more cases in the same child care group.
- Notify the state or local health department about an excessive level of diarrhea or any *Cryptosporidium* infections in a daycare. *Cryptosporidium* is a reportable disease.

## **References**

American Academy of Pediatrics. Pickering LK, ed. 2006 Red Book: Report of the Committee on Infectious Diseases. 27<sup>th</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006.

Heymann, DL, ed. Control of Communicable Diseases Manual. 18<sup>th</sup> edition. Washington, DC: American Public Health Association; 2004.

# CRYPTOSPORIDIOSIS

## What is cryptosporidiosis?

Cryptosporidiosis is a disease caused by an organism called *Cryptosporidium*.

## What are the symptoms of cryptosporidiosis?

Illness usually begins about 2 to 14 days after being exposed to the organism. Symptoms include watery diarrhea and stomach cramping. Some persons vomit and have a low-grade fever. Symptoms may come and go and last for about 2 weeks, but sometimes continue for up to a month.

## How is cryptosporidiosis spread?

Persons or animals become infected by swallowing the organism. This may happen when a person or animal drinks water or eats food "dirty" or contaminated with infected stool (feces) material. *Cryptosporidium* may also be spread if a person touches objects contaminated with the stool and gets the organism on their hands. Their unwashed hands can then transfer the organisms to their mouth. Some people have become sick after swimming in public pools contaminated with stools from infected persons.

## How long are people contagious?

In most cases, stools no longer contain the organism after 2 weeks.

## Who gets cryptosporidiosis?

Anyone, but it may be more common in persons with weakened immune systems.

## What treatment is available for people with cryptosporidiosis?

Treatment with a drug called nitazoxanide (Alinia®) is available for people over one year of age that have a healthy immune system. Persons with diarrhea should drink plenty of fluids. People with weakened immune systems should see their doctor if they think they have cryptosporidiosis.

## Do infected people need to be kept home from school, work or daycare?

Since *Cryptosporidium* is passed in the stool, children and staff in daycare centers, health care workers, or people who handle food should not go to school or work while they have diarrhea. After diarrhea ends, persons may return to work or school and they should continue to observe handwashing practices.

## How can I protect myself and my family from getting cryptosporidiosis?

You can decrease your chance of coming in contact with *Cryptosporidium* with these practices:

- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper and before preparing and/or eating meals.
- Promptly clean contaminated surfaces with 3% hydrogen peroxide.
- Carefully dispose of sewage wastes so as not to contaminate surface or groundwater.
- Avoid food or water from sources that may be contaminated.
- Avoid accidentally swallowing water from lakes, rivers or swimming pools.



# CRIPTOSPORIDIASIS

## ¿Qué es la criptosporidiasis?

La criptosporidiasis es una enfermedad causada por un organismo que se llama *Cryptosporidium*.

## ¿Cuáles son los síntomas de la criptosporidiasis?

La enfermedad normalmente comienza entre 2 y 14 días después de haber estado expuesto al organismo. Los síntomas incluyen diarrea acuosa y retorcijones. Algunas personas tienen vómitos y fiebre baja. Los síntomas pueden ir y venir, y seguir por dos semanas, pero a veces pueden continuar por un mes.

## ¿Cómo se transmite la criptosporidiasis?

Las personas o los animales pueden contraer la infección si se tragan este organismo. Esto puede ocurrir cuando las personas o los animales toman agua o alimentos que están contaminados o "ensuciados" con materia fecal infectada. El *Cryptosporidium* también puede transmitirse si la persona toca las heces o los objetos contaminados por éstas y, así, pasan el germen a sus manos. Si no se lavan las manos, pueden transferir los organismos de la mano a la boca. Algunas personas se han enfermado después de nadar en piscinas públicas donde el agua estaba contaminada con heces de personas infectadas.

## ¿Por cuánto tiempo puede alguien con criptosporidiasis contagiar a otros?

En la mayoría de los casos, el organismo deja de estar presente en las heces infectada después de 2 semanas.

## ¿Quién puede contraer la criptosporidiasis?

Cualquier persona puede contraerla, pero es más común en personas que tienen su sistema inmunológico debilitado.

## ¿Cómo se trata la criptosporidiasis?

Hay una droga disponible para tratamiento de la infección en personas más de un año que tiene sistemas de inmunidad saludables. La droga se llama nitazoxanide (Alinia®). Pregunte su doctor sobre esta droga. Si se tiene diarrea, hay que tomar muchos líquidos. Las personas que tienen su sistema inmunológico debilitado, sobre todo, deben ir al médico si piensan que pueden tener esta enfermedad.

## ¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?

Como el *Cryptosporidium* está presente en las heces, los niños y los que trabajan en guarderías, clínicas de salud o aquellos que trabajan manipulando alimentos deben quedarse en casa y no ir a la escuela o al trabajo mientras tengan diarrea. Una vez que la diarrea desaparece, pueden regresar al trabajo o a la escuela pero deben tener especial cuidado y lavarse las manos después de usar el baño.

## ¿Cómo puedo protegerme yo y también proteger a mi familia contra la criptosporidiasis?

Para disminuir sus posibilidades de entrar en contacto con el *Cryptosporidium*, haga lo siguiente:

- Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales y antes de preparar o comer alimentos.
- Desinfecte pronto las superficies contaminadas con 3% agua oxigenada.
- Elimine desechos residuales o aguas negras con cuidado de no contaminar otras fuentes de agua (como agua de ríos, pozos, etc.).
- Evite agua o comida que puedan provenir de fuentes contaminadas.
- Evite tragar de forma accidental agua de lagos, ríos, piscinas o albercas.



