

CRYPTOSPORIDIOSIS

Bioterrorism Agent Profiles for Health Care Workers

Causative Agent: Cryptosporidiosis is a parasitic infection caused by *Cryptosporidium parvum*.

Route of Exposure: Fecal-oral, which includes person to person, animal to person, waterborne, and foodborne transmission.

Infective Dose & Infectivity: Less than 10 organisms, and presumably one organism, can initiate an infection. All people are believed to be susceptible, though people with intact immune systems may be asymptomatic. Individuals with impaired immunity and children ages 1 to 5 years old are most likely to become infected.

Incubation Period: The incubation period is not precisely known; 1-12 days is the likely range, with an average of about 7 days.

Clinical Effects: Asymptomatic infections are common and constitute a source of infection for others. The major symptom in humans is diarrhea, which may be profuse and watery, preceded by anorexia and vomiting in children. The diarrhea is associated with cramping abdominal pain. General malaise, fever, anorexia, nausea and vomiting occur less often. Symptoms often wax and wane but remit in fewer than 30 days in most immunologically healthy people. In patients who are immunocompromised, cryptosporidiosis usually causes chronic diarrhea; however, rarely, lung and biliary tract disease also occurs.

Lethality: Cryptosporidiosis is rarely lethal in healthy people. In persons with severely weakened immune systems, chronic gastrointestinal illness or more disseminated disease can lead to complications and death.

Transmissibility: It is transmitted by ingestion of fecally contaminated food or water, including water swallowed while swimming; by exposure to fecally contaminated environmental surfaces; and by the fecal-oral route from person to person (e.g. while changing diapers caring for an infected person, or engaging in certain sexual behaviors).

Primary Contamination & Methods of Dissemination: In a terrorist attack, *C. parvum* would most likely be disseminated through the intentional contamination of food or water supplies.

Secondary Contamination & Persistence of organism: Secondary transmission can result from exposure to the stool of infected individuals, both patients with acute infection and asymptomatic carriers. Oocysts, the infectious stage, appear in the stool at the onset of symptoms and are infectious immediately upon excretion. Oocysts continue to be excreted in the stool for several weeks after symptoms resolve; outside the body, they may remain infective for 2-6 months in a moist environment. Oocysts are highly resistant to chemical disinfectants used to purify drinking water.

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Decontamination & Isolation:

Patients – No decontamination necessary. Patients should be treated with standard precautions, with contact precautions for diapered or incontinent patients. Hand washing is of particular importance. For hospitalized patients, enteric precautions in the handling of feces, vomitus, and contaminated clothing and bed linen; exclusion of symptomatic individuals from food handling and from direct care of hospitalized and institutionalized patients; release to return to work in sensitive occupations when asymptomatic.

Equipment, clothing & other objects – Infection control is difficult because of oocyte resistance to common disinfectants. Heating to 113° F (45° C) for 5-20 minutes, 140° F (60° C) for 2 minutes, or chemical disinfection with 10% formalin or 5% ammonia solution is effective.

Laboratory Testing: Diagnosis is made by identification of oocysts in stool samples. However, routine laboratory testing for ova and parasites will not detect *C. parvum*. A specific request for *C. parvum* testing must be made. Commercially available tests include ELISA assays for stool, and a fluorescein-tagged monoclonal antibody is useful for detecting oocysts in both stool and environmental samples.

Therapeutic Treatment: Supportive therapy with rehydration as needed is important. Nitaxozanide suspension (Alina™, Romark Laboratories) was recently approved by the FDA for treatment of cryptosporidiosis. If the patient is taking immunosuppressive drugs, these should be stopped or reduced if possible.

Prophylactic Treatment: No vaccine is available.

Differential Diagnosis: The differential diagnosis for *Cryptosporidium parvum* includes *Giardia*, *Isospora*, microsporidia, *Cyclospora*, *Clostridium difficile*, *Salmonella*, *Shigella*, *Campylobacter*, *Mycobacterium avium* complex, cytomegalovirus, rotavirus, norovirus, and adenovirus.

References:

Chin J. Control of Communicable Diseases Manual, Seventeenth Edition, American Public Health Association; 2000.

Center for Food Safety and Applied Nutrition. Foodborne Pathogenic Microorganisms and Natural Toxins Handbook, U.S. Food and Drug Administration
<http://vm.cfsan.fda.gov/~mow/intro.html>

For more information call (602) 364-3289

Frequently Asked Questions About Cryptosporidiosis

What is Cryptosporidiosis?

Cryptosporidiosis (krip-toe-spo-rid-e-o-sis), is a diarrheal disease caused by a microscopic parasite, *Cryptosporidium parvum*. It can live in the intestine of humans and animals and is passed in the stool of an infected person or animal. Both the disease and the parasite are also known as "Crypto." The parasite is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it very resistant to chlorine disinfection. During the past two decades, Crypto has become recognized as one of the most common causes of waterborne disease (drinking and recreational) in humans in the United States. The parasite is found in every region of the United States and throughout the world.

What are the symptoms of Crypto?

Symptoms include diarrhea, loose or watery stool, stomach cramps, upset stomach, and a slight fever. Some people have no symptoms.

How long after infection do symptoms appear?

Symptoms generally begin 2-10 days after being infected.

How long will symptoms last?

In persons with average immune systems, symptoms usually last about 2 weeks; the symptoms may go in cycles in which you may seem to get better for a few days, then feel worse, before the illness ends.

How is Crypto spread?

Crypto lives in the intestine of infected humans or animals. Millions of Crypto can be released in a bowel movement from an infected human or animal. You can become infected after accidentally swallowing the parasite. Crypto may be found in soil, food, water, or surfaces that have been contaminated with the feces from infected humans or animals. Crypto is not spread by contact with blood. Crypto can be spread:

- By putting something in your mouth or accidentally swallowing something that has come in contact with the stool of a person or animal infected with Crypto.
- By swallowing recreational water contaminated with Crypto. Recreational water is water in swimming pools, hot tubs, jacuzzis, fountains, lakes, rivers, springs, ponds, or streams that can be contaminated with sewage or feces from humans or animals. Note: Crypto is chlorine resistant and can live for days in pools.
- By eating uncooked food contaminated with Crypto. Thoroughly wash with uncontaminated water all vegetables and fruits you plan to eat raw. See below for information on making water safe.
- By accidentally swallowing Crypto picked up from surfaces (such as toys, bathroom fixtures, changing tables, diaper pails) contaminated with stool from an infected person.

I have been diagnosed with Crypto. Should I worry about spreading infection to others?

Yes, Crypto can be very contagious. Follow these guidelines to avoid spreading Crypto to others.

- Wash your hands with soap and water after using the toilet, changing diapers, and before eating or preparing food.
- Avoid swimming in recreational water (pools, hot tubs, lakes or rivers, the ocean, etc.) if you have Crypto and for at least 2 weeks after diarrhea stops. You can pass Crypto in your stool and contaminate water for several weeks after your symptoms have ended. This has resulted in many outbreaks of Crypto among recreational water users. Note: you are not protected in a chlorinated pool because Crypto is chlorine resistant and can live for days in pools.
- Avoid fecal exposure during sex.

Am I at risk for severe disease?

Although Crypto can infect all people, some groups are more likely to develop more serious illness. Young children and pregnant women may be more susceptible to the dehydration resulting from diarrhea and should drink plenty of fluids while ill.

If you have a severely weakened immune system, you are at risk for more serious disease. Your symptoms may be more severe and could lead to serious or life-threatening illness. Examples of persons with weakened immune systems include those with HIV/AIDS; cancer and transplant patients who are taking certain immunosuppressive drugs; and those with inherited diseases that affect the immune system.

How is a Crypto infection diagnosed?

Your health care provider will ask you to submit stool samples to see if you are infected. Because testing for Crypto can be difficult, you may be asked to submit several stool specimens over several days. Because tests for Crypto are not routinely done in most laboratories, your health care provider should specifically request testing for the parasite.

What is the treatment for Crypto?

There is no consistently effective treatment for Crypto. Most people with a healthy immune system will recover on their own. Drinking plenty of fluids will help to prevent dehydration. Antidiarrheal medicine may help slow down diarrhea, but consult with your physician.

Rapid loss of fluids because of diarrhea can be very serious in babies. Parents should consult their health care provider about fluid replacement therapy options for babies. Children should not be given antidiarrheal medicine for severe diarrhea without first consulting their physician.

People who are on medicines that weaken their immune system are at higher risk for more severe and more prolonged illness; treatment for them could include cutting back on these medicines. In addition, patients with HIV infection can develop chronic diarrhea from Crypto; they can be helped by optimizing their antiretroviral medicines.

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