Cryptosporidium and Your Water Supply

What is Cryptosporidium (pronounced crip-toe-spor-id-ee-um)?

Cryptosporidium is a parasite that lives in the intestines of animals and people. It causes a disease called cryptosporidiosis (crip-toe-spor-id-ee-O-sis). Many people use the shortened version of “crypto” when talking about Cryptosporidium. Crypto, which cannot be seen without a very powerful microscope, is so small that over 10,000 of them would fit on the period at the end of this sentence. The eggs of this parasite are known as oocysts (O-o-sists).

How does it get into a water supply?

Oocysts are present in most surface bodies of water like lakes, rivers, streams or springs, that are often sources of supplies for public drinking water. Oocysts are more prevalent in surface water when heavy rains increase runoff of wild and domestic animal wastes from the land, or when sewage treatment plants are overloaded or break down.

How can residents tell if their tap water is safe to drink?

A properly designed, operated, and maintained water treatment plant will improve removal of crypto. Properly drilled and maintained wells that tap into groundwater are unlikely to contain crypto because of the natural filtration that takes place as water percolates down through the soil. However, contaminants may flow into groundwater aquifers that lie beneath coarse soils or fractured bedrock. Very shallow or poorly constructed wells and springs can be contaminated with surface water runoff that carries disease-causing microbes. It is important that the well be protected from surface contamination by an intact well casing, proper seals, and a cap above ground.

The risk of waterborne cryptosporidiosis from public drinking water varies depending on the quality of the source water and type of water treatment. When testing of public drinking water indicates potential danger, the Department of Environmental Protection (DEP) and/or the water supplier will issue a “boil water” advisory.

Is cryptosporidiosis a new disease?

Cryptosporidiosis has long been a veterinary problem, predominantly in young farm animals such as calves. Cryptosporidium was first recognized as a cause of human disease in 1976, but was rarely reported in humans until 1982. The number of detected cases began to rise rapidly along with the development of methods to identify the parasite in stool samples. The earliest cases of human cryptosporidiosis were diagnosed in animal handlers. An outbreak at a day care center was first documented in 1983.

In 1987, 13,000 people in Carrollton, Georgia became ill with cryptosporidiosis. This was the first known instance where it spread through a municipal water system that previously met all state and federal drinking water standards. In the spring of 1993, in Milwaukee, Wisconsin municipal drinking water, again within standards, was contaminated with Cryptosporidium. An estimated 403,000 people became ill and the disease contributed to the deaths of over 100 people, mostly elderly and immunocompromised people, such as AIDS patients. These outbreaks focused attention on the risk of waterborne cryptosporidiosis and the possible need for stricter drinking water standards.

How is cryptosporidiosis spread?

People can become infected by crypto by putting anything in their mouth that has touched the feces of a person or animal with crypto. People can also become infected by crypto by touching their mouth after touching the feces of infected persons or animals, or touching soil or objects contaminated with feces. Drinking contaminated water or eating contaminated food can also give you cryptosporidiosis.

Drinking untreated surface water from streams, rivers, lakes and springs also can cause the illness. The parasite may spread through uncooked foods, beverages or ice prepared with contaminated water. Unwashed fresh fruits or vegetables may carry oocysts if manure was used or animals grazed where the crop was grown.

Frequent handwashing is the single most important thing people can do to avoid spreading crypto and other illnesses.
What are the symptoms of cryptosporidiosis?

The most common symptom is watery diarrhea. However, watery diarrhea is a symptom of many intestinal diseases caused by bacteria, viruses or parasites. Cryptosporidiosis cannot be diagnosed by diarrhea alone. There may also be abdominal cramps, nausea, low-grade fever, dehydration, and weight loss. Symptoms usually develop four to six days after infection, but may appear anytime from two to ten days after infection.

How is the public water supply treated?

Physical removal of particles, including oocysts, from water by filtration is an important step in the municipal water treatment process. Typically, water pumped from rivers or lakes into a treatment plant is mixed with coagulants that help settle out particles suspended in the water followed by sand filtration that removes more particles. Finally, the finished water is disinfected and piped to consumers.

Under the Pennsylvania Filtration Rule of 1989, public water systems are required to filter surface water sources. The U.S. Environmental Protection Agency (EPA) has recently set new standards for turbidity (cloudiness) and coliform bacteria; each of these parameters indicate pathogens are probably present in drinking water. Frequent monitoring is required so officials will have an early warning of potential problems and can take steps to protect public health.

Oocysts are not killed by typical chlorine disinfectants, but are killed at temperatures over 160 degrees Fahrenheit (hotter than most domestic hot tap water). Water should be brought to a rolling boil for at least one minute.

Boiling water is one of the most effective ways of killing Cryptosporidium.

Boiled water should be stored in the refrigerator in a clean bottle or pitcher with a lid. To prevent recontamination, be careful not to touch the inside of the water bottle or lid. As always, be very careful when boiling water or handling boiled water to avoid scalding.

As an alternative to boiled water, point-of-use filters may be used to treat water by attaching a unit to the faucet or by using tabletop pour-through containers that hold a small amount of water. NSF International, an independent non-profit testing agency, publishes lists of filters and treatment units certified for “cyst reduction.”

What is the role of DEP?

DEP field staff regularly inspect public water systems to ensure that all operators have the knowledge and equipment to optimize the performance of their facilities and thereby protect the citizens of Pennsylvania. DEP conducts a special program to monitor and evaluate surface water filtration plants to ensure that oocysts are removed from the source water.

When an increased health risk is identified, DEP directs the supplier to take immediate steps to protect consumers by issuing a boil water advisory and increasing the chlorine concentration in the water supply. These measures remain in effect until the source of the contamination is identified and treatment is improved.

DEP Regional Offices of the Bureau of Safe Drinking Water are available to answer questions concerning the quality of your drinking water.

Other sources of information:

1. For more information on Cryptosporidium, contact your doctor or other healthcare provider.
2. The National Center for Disease Control and Prevention (CDC) [www.cdc.gov/parasites/crypto/](http://www.cdc.gov/parasites/crypto/).
5. Pennsylvania Department of Health: 877-724-3258, or their website at [www.health.state.pa.us](http://www.health.state.pa.us).

For more information, visit [www.dep.pa.gov](http://www.dep.pa.gov).