

Giardia and Cryptosporidium in Drinking Water

What are Giardia and Cryptosporidium?

Giardia and *Cryptosporidium* are microscopic parasites that can be found in water. *Giardia* causes an intestinal illness called giardiasis or "beaver fever." *Cryptosporidium* is responsible for a similar illness called cryptosporidiosis.

How do These Parasites Cause Illness?

Both parasites produce cysts that are very resistant to harsh environmental conditions. When ingested, they germinate, reproduce, and cause illness. Studies with human volunteers have shown that ingestion of only a few cysts can cause illness.

What are the symptoms?

Diarrhea, abdominal cramps, gas, malaise, and weight loss are the most common symptoms caused by *Giardia*. Vomiting, chills, headache, and fever may also occur. These symptoms usually appear 6 to 16 days after the ingestion of contaminated water. The symptoms of cryptosporidiosis are similar; the most common include watery diarrhea, abdominal cramps, nausea, and headaches. These usually symptoms occur within 2 to 12 days after ingestion and usually last one or two weeks; in some cases up to a month.

How are infections treated?

Giardia is usually cleared from healthy people without treatment within a month. Anti-parasitic drugs are available and are particularly helpful for immunocompromised people in whom the illness could otherwise develop into a persistent state.

Cryptosporidium will also usually disappear from healthy people within a month without treatment. Rehydration therapy may be used if diarrhea becomes severe. No medications to treat the illness have been approved, though many are now being researched.

What extra precautions can immunocompromised people take?

Both parasites, but particularly *Cryptosporidium*, can pose a serious threat to immunocompromised people, such as those living with AIDS or cancer, or transplant patients receiving immunosuppressive drugs. For these people, the symptoms are more severe and can be life threatening.

It is presently unknown whether immunocompromised individuals are at greater risk of contracting giardiasis or cryptosporidiosis than the general public. Nevertheless, immunocompromised individuals should discuss these risks with their physicians. People who wish to take extra precautions can boil their water for one minute to kill any parasites that may be present. This practice will also destroy any other microorganisms that might be harmful to your health. If you use bottled water as an alternative to boiled tap water, choose a supplier carefully to ensure their product meets your required standards.

What Should You Tell Your Physician?

If you are suffering from diarrhoea and suspect that your symptoms may be due to *Giardia* or *Cryptosporidium*, visit your physician and mention any exposure you may have had to water, food, or faeces that may have been contaminated by the parasites.

How can drinking water become contaminated with these parasites?

Drinking water sources become contaminated when faeces containing the parasites are deposited or flushed into water. If treatment is inadequate, drinking water may contain sufficient numbers of parasites to cause illness. Other sources include direct exposure to the faeces of infected humans and animals, eating contaminated food, and accidental ingestion of contaminated recreational water. *Giardia* is often found in human, beaver, muskrat, and dog faeces. Cattle faeces appear to be the primary source of *Cryptosporidium*, although these parasites have also been found in humans and other animals.

How can these waterborne illnesses be prevented?

Municipal drinking water treatment providing filtration and disinfection with chlorine can reduce the risk of contracting giardiasis and cryptosporidiosis. Chlorine by itself is not effective against *Cryptosporidium* but can inactivate *Giardia*. Recent research indicates that ultraviolet light will inactivate both organisms. Protection of the raw water supply is also beneficial.

If *Giardia* or *Cryptosporidium* in municipal drinking water is suspected or known to be the cause of an outbreak, public health authorities will issue a boil water advisory to help control the spread of illness.

In the outdoors, water should be boiled for at least one minute before it is used for drinking, food preparation or dental hygiene. This treatment will destroy *Giardia*, *Cryptosporidium*, and any other disease-causing microorganisms that might be present. Certain types of filters can remove the parasites.

Travellers to countries where the safety of drinking water is suspect should boil or disinfect and filter water that is to be used for drinking, food preparation, or dental hygiene.

Are water supplies tested for *Giardia* and *Cryptosporidium*?

Unfortunately, no reliable methods are currently available to detect these parasites on a routine basis. This is largely because the methods underestimate the number of organisms present and do not provide any information on their capacity to cause illness in humans. The tests that do exist take a few days to produce results, which mean they aren't very good for day-to-day monitoring. Research is underway to develop appropriate detection methods and treatment technology to safeguard drinking water against these parasites.

A guideline has been established for *Giardia* and *Cryptosporidium*, but because the current detection methods are not very reliable there is no maximum acceptable concentration (MAC) value. The guideline does encourage water treatment authorities to implement measures aimed at reducing the risk of illness as much as possible.

For Further information please contact Public Health or your physician.

References: Control of Communicable Diseases Manual, Heymann, David, L. Editor, 19th Edition, Health Canada, *Giardia* and *Cryptosporidium* in Drinking Water, http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/giardia_cryptosporidium-eng.php