

Giardia and Cryptosporidium in Manitoba Water Supplies

What micro-organisms can be found in drinking water?

There are three main types of disease-causing micro-organisms that affect drinking water: bacteria, viruses and protozoa, such as *Giardia* (gee-AR-dee-uh) and *Cryptosporidium* (crip-toe-spor-ID-ee-um).

Bacteria and viruses are relatively easy to kill with common disinfectants such as chlorine. Protozoa are different. Chlorine can kill *Giardia* but does not kill *Cryptosporidium*. Protozoa can live in the guts or small intestines of humans and other mammals. They pass into the environment through their faeces as cysts or oocysts. Protozoan cysts and oocysts are bigger than bacteria or viruses. They have a hard shell that helps them survive a long time in the environment and protects them against chlorine.

What water systems are at risk for *Giardia* and *Cryptosporidium*?

Giardia and *Cryptosporidium* can be found in:

- surface water (ex: lakes, reservoirs, rivers, streams)
- shallow or poorly-built wells or springs that may be at risk of contamination from surface water

Deep, properly-built wells do not usually contain them.

Sources of both *Giardia* and *Cryptosporidium* in surface water can include: human sewage and faeces from cattle, beavers, dogs, muskrats, sheep, horses, hogs and waterfowl.

Surveys done around the world show levels of *Giardia* and *Cryptosporidium* in surface water sources can vary a lot. To date, levels found in Manitoba surface waters have been very low. However, tests done across Canada and in other regions, show levels can rise suddenly, especially during heavy rain and floods.

How could I be exposed to *Giardia* or *Cryptosporidium*?

People can be exposed to *Giardia* or *Cryptosporidium* through person-to-person contact, animal-to-person contact, food, water used for recreation (ex: swimming) and poorly-treated drinking water. Person to person contact is the most common way *Giardia* is spread. Direct and indirect contact with livestock are common ways to become infected with *Cryptosporidium*.

Most outbreaks of illness linked to drinking water have been from small surface water systems that don't filter the water or don't filter it very well. People have also become ill from drinking untreated or poorly-treated surface water while camping.

What are the health risks of *Giardia* and *Cryptosporidium*?

For most people, infections may not cause symptoms, but for some people, these protozoa can cause:

- diarrhoea
- cramps
- nausea or vomiting
- low-grade fever or chills
- weight loss

Some people with *Giardia* infections, especially children, may have repeated symptoms that can last for months or years.

People with *Cryptosporidium* infections are more likely to show signs of illness. Their recovery time depends on their immune systems. People with weakened immune systems may have a long-term illness that can be fatal. At greatest risk are people who have:

- an organ transplant
- cancer and are taking chemotherapy or radiation therapy

- HIV or AIDS
- been otherwise advised by their health care provider that they are immune-compromised and should take precautions.

How do drinking water suppliers protect against these two protozoa?

Proper treatment of surface water (ex: lakes, rivers, streams) and vulnerable groundwater (ex: shallow wells and springs) reduces the risk from *Giardia* and *Cryptosporidium*. Proper treatment includes filtration and disinfection. Since protozoa are relatively large micro-organisms, they are easier to filter out than bacteria and viruses.

Drinking water is disinfected to destroy or inactivate the micro-organisms that are not filtered out. Chlorine is the most common disinfectant in the world. It can work against *Giardia* but not *Cryptosporidium*. Ultraviolet (UV) light is another type of disinfectant that works against both *Giardia* and *Cryptosporidium*.

How do I know if my water supply is at risk for *Giardia* and *Cryptosporidium*?

Water systems that rely on surface water, or shallow or poorly-built wells or springs that do not have proper filtration and disinfection may be at risk of *Giardia* and *Cryptosporidium* contamination. While levels of protozoa measured in Manitoba surface waters to date have been very low, people should consider taking extra precautions during floods or heavy rainfalls or if they have a compromised immune system.

For information on your drinking water treatment system, contact your water supplier or the drinking water officer

in your region. Large, public water suppliers must make annual reports available to the public, and post a copy of those reports on the Internet.

How can I lower my risk of exposure to *Giardia* and *Cryptosporidium*?

Consumers who rely on a surface water system that does not have treatment in place to remove protozoa can reduce their risks by:

- boiling drinking water for one minute
- switching to an alternate drinking water supply (ex: bottled water, a deeper well or a cistern)
- installing a home water-treatment system

If you buy a home treatment system, look for filters or equipment that have been certified by an accredited organization to remove protozoa. Certification standards help ensure the safety and performance of retail products for drinking water.

The protozoa removal standards are set by NSF International (NSF) or the American National Standards Institute (ANSI). Certification organizations make sure the treatment filters and equipment meet these standards. Accredited certification organizations include:

- NSF International (NSF)
- Canadian Standards Association (CSA)
- Underwriters Laboratories Incorporated (UL)
- Water Quality Association (WQA)
- Quality Auditing Institute
- International Association of Plumbing and Mechanical Officials (IAPMO)

Always follow the manufacturer's instructions on how to use and maintain any home water treatment filters or equipment.

Where can I get more information?

For details on *Giardia* and *Cryptosporidium*:

- call Health Links-Info Sante at 204-788-8200 in Winnipeg; toll free at 1-888-315-9257
- www.manitoba.ca/health/publichealth/cdc/fs/crypto.pdf
- www.gov.mb.ca/health/publichealth/cdc/fs/giardia.pdf
- www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/giardia_cryptosporidium-eng.php

For Health Canada guidelines on protozoa:

- www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/protozoa/index-eng.php

For details on home water treatment:

- call NSF International free hotline at 1-877-867-3435
- www.nsf.org
- www.hc-sc.gc.ca

For details on drinking water treatment while camping or away from home:

- www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/outdoor-plein_air-eng.php
- www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/home-foyer-eng.php

For details on drinking water in Manitoba or to find contact information for your local drinking water officer:

- www.manitoba.ca/drinkingwater