

Waterborne Disease Alert for Campers

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Even though Wyoming streams, rivers, lakes, and springs are famous for their natural beauty and clear, sparkling water, all back-country water should be considered contaminated by *Giardia* or other potentially harmful microorganisms. Drinking straight from these water sources invites disease. *Giardia* is a leading cause of waterborne infectious diarrhea. Other organisms of concern are *Cryptosporidium* and *Campylobacter*.

Giardia lamblia is a protozoan that causes a disease called giardiasis. It has a two-stage life cycle. In the infectious stage, *Giardia* is a microscopic cyst found in raw water supplies and the fecal material of animals and humans. It can survive in cold water and feces for weeks. As few as 10 cysts can establish an infection in humans. However, only about 20 to 30 percent of people infected with *Giardia* will be clinically affected by it. The other 70 to 80 percent are symptom-less carriers, like reservoirs of infection.

Within 30 minutes of ingestion, *Giardia* cysts develop into the adult protozoan life stage, multiply, and colonize the upper small intestine of their host. While there, they interfere with nutrient absorption, especially fat uptake. Symptoms of giardiasis do not usually develop for one to four weeks after ingestion. They include diarrhea, abdominal cramps, nausea, flatulence, vomiting, greasy and foul smelling stools, distention of the abdomen, fever, and alternating bouts of diarrhea and constipation. In addition, severe dehydration and weight loss may occur. Diagnosis requires multiple stool samples over a long period of time. Treatment involves the use of specific antibiotics and/or chemotherapy. Giardiasis may reoccur after an initial treatment, thus requiring a second round or even a third.

Cryptosporidium is also a protozoan parasite. Oocysts (egg capsules) of this organism are shed in the feces of infected animals and people and can contaminate water. It is a major concern in the dairy industry in which workers come in contact with infected calves. Runoff from sewage can contaminate ground water.

Cryptosporidium oocysts can be transmitted through person-to-person or animal-to-human contact and through the ingestion of fecally contaminated water, food, or air. The incubation period of cryptosporidiosis is about the same as for giardiasis, and the disease can run its course in one to two weeks. Symptoms include diarrhea, abdominal cramps, nausea, flatulence, and vomiting. Severe dehydration and weight loss may also occur. Cryptosporidiosis is often very difficult to diagnose. There is no treatment for the disease although some antibiotics are used to provide relief from the symptoms.

Campylobacter is a bacteria found in streams and lakes. It causes diarrhea, abdominal pain, fever, and vomiting and is usually self-limiting in a few days. All domestic animals including poultry, sheep, cattle, dogs, cats, and wild animals and also humans can be hosts to *Campylobacter*. It is carried by elk in Wyoming and therefore is a potential contaminant in much of the state.

Waterborne intestinal infections can make people very sick. Here is how to avoid them:

- Bring water from a reliable source when hiking. Do not drink water from a stream or lake no matter how clear and clean it appears. Municipal water treatment plants usually produce water that meets federal water quality standards.

- Wash one’s hands carefully after handling any fecal material such as after changing diapers, cleaning up after a pet, or touching animals. Always properly dispose of diapers so the environment is not contaminated. Special attention should be given to the personal hygiene of preschoolers. A leading method of *Giardia* and *Cryptosporidium* transmission is through fecal-oral contamination at day care centers and infant nurseries.
- Wash one’s hands prior to handling food. Use boiled water for washing dishes and add one to two tablespoons of chlorine bleach per gallon of boiled rinse water when camping to help disinfect utensils, pots, and dishes. Wash fruits and vegetables in only safe or treated water. Use safe or treated water to make instant puddings, gelatins, and other uncooked foods. Avoid using snow. Do not take dogs into the back country. They will drink from untreated water sources and can infect people at a later time.

If one cannot avoid drinking water from an unreliable source, he or she should use the following precautionary measures. The best protection is to boil the water. Filters work better than chemical treatment.

- Boiling – Bring raw water to a full rolling boil and boil for at least two to five minutes. Also, be sure to boil foods with added water for at least two to five minutes.
- Portable water purification filters – These convenient devices contain filters with microscopic pores. They are often impregnated with chemical disinfectants such as silver iodide, which has not shown to be effective against *Giardia*. Water is pumped through the device, and cysts and large bacteria are supposedly filtered out. Microstraining filters should have a pore size of less than 1 micron. Remember that the smaller the pores, the more quickly the filter will tend to clog. To obtain maximum useful filter life and as a matter of precaution, the cleanest available water source should always be used. Properly designed filters should minimize the need to directly touch or handle surfaces potentially contaminated with

infectious organisms. They should minimize the possibility of contaminating the clean side of the filter with contaminated water during both replacement and cleaning and normal operation. This is especially important for filters used in the field where they are often rinsed in a stream that may be contaminated.

- Chemical treatment – Too many factors come into play when using chemical treatments for any of the tablets or methods to be considered foolproof. One of the most reliable chemical treatments for *Giardia* and *Campylobacter* is an iodine-based tablet labeled “emergency drinking water germicidal tablets” with the active ingredient tetraglycine hydroperiodide. These tablets, however, are considered ineffective against *Cryptosporidium*. They are most effective when the water is warmed to 70 degrees Fahrenheit and allowed to sit for 20 minutes after a tablet is added. Be sure to follow directions carefully. Chemical water treatment disinfection methods using chlorine or halazone tablets are the least reliable for treating water.

Who’s at Risk?

- Back-country travelers who drink untreated water from any source
- People who accidentally ingest non-treated water
- People whose home drinking water comes from unchlorinated and unfiltered surface water, springs, or very shallow wells
- Infants and children, especially those in day care facilities, and the people who work with them
- Travelers in foreign countries, especially countries with poor sanitation and untreated surface water
- People who are in close contact with infected animals (risk of *Cryptosporidium* infection especially).

Issued in furtherance of cooperative extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Jim DeBree, Director, Cooperative Extension Service, University of Wyoming, Laramie, Wyoming 82071.

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