



## Water Filters and Purifiers

It is possible to drink straight from backcountry streams and never become ill, however there is a risk associated with this practice.

Nitrates, animals waste, bacteria, cryptosporidium and giardia are just a few of the dangers that lurk in back county water. In fact, you cannot see nor in most cases smell the contaminants that can harm you. So what should you do to protect yourself from the impurities of backcountry water?

Here's a brief overview to help clean up the confusion surrounding, which type of water treatment system is right for you.

The water filters and water purifiers both remove bacteria while only purifiers remove viruses as they force water (with a pumping mechanism) through a filtering device.

1. Waterborne viruses are believed to be less common in North American wilderness waters, but if you're traveling outside of the United States, you may want to opt for a more effective water purifying system.
2. When comparing filters and purifiers, look for an absolute—not nominal—pore size of 0.2 microns. This industry wide benchmark indicates the system's smallest filtering capability. No bacteria larger than 0.2 microns can get through. Though a larger pore size of 0.3 or 0.4 may suffice in most situations, why take the risk.
3. Depending on its function, a water-treatment system can have numerous parts, some of which will need to be maintained or replaced on a regular basis. If your travel plans include many nights away from a reliable water source, you will not only have to pack the filter but the back-up and replacement parts that go with it.

Lastly, to get the cleanest water possible be sure to clean and dry your filtering system regularly. When in the outdoors, try to collect still, clear water. Whenever possible, boil the water before treating it. Then, just as if you were seasoning a skillet, let the first few streams of water pass before you begin collecting your treated water.

## **Explaining Water Filters and Purifiers**

Portable water filters and purifiers both operate on the same mechanical principle. Using a hand pump and intake hose, both slurp up "raw" water from a lake or stream and force it through an internal element (a filtering "medium"). This medium traps suspended elements from fine sediment to invisible microorganisms—before dispensing clean water into a container of your choice.

### **What are the Differences?**

**Water filters** - A microbiological device that removes bacteria (e.g., *Campylobacter jejuni*) and protozoan cysts (*Giardia lamblia*, *cryptosporidium*) from contaminated water.

**Water purifier**—A microbiological device that removes bacteria, protozoan cysts and viruses (e.g., hepatitis A) from contaminated water.

Viruses are infinitesimal organisms too tiny to be trapped by a filter. Devices identified as "purifiers" usually cause water to interact with iodine (often in the form of iodine resins), which can render viruses inactive. Another purifier uses a positive electrostatic charge in its filter medium to capture viruses.

#### **Viruses:**

- may exist in water wherever there is a reasonable chance of human fecal contamination;
- are believed to be less prevalent in North American wilderness water sources than protozoan cysts or bacteria, but may be a greater threat in less developed countries.

Over time, filters have proven that they reliably protect wilderness travelers from the most common waterborne pathogens found in the North American

backcountry: giardia and cryptosporidium. Still, purifiers and their antiviral feature offer an elevated level of security.

To fully disinfect suspect water using a water filter, the Centers for Disease Control and Prevention recommends 1) mechanically filtering the water, 2) treating it with a halogen (chlorine or an iodine solution), 3) letting it sit 15 to 60 minutes, 4) then drinking. For more details on this process, and a discussion of what pathogens may be found in backcountry water.