BRITISH COLUMBIA | HealthLinkBC

Number 49b
August 2016

Disinfecting Drinking Water

Why should drinking water be disinfected?

Water from lakes, rivers, or streams and many groundwater sources may contain disease-causing "germs" called pathogens, which can lead to water-borne infections. Water-borne illnesses can lead to severe reactions and serious complications, including death. Water-borne infections can spread when animal or human feces containing these pathogens get into drinking water. These pathogens may include bacteria, viruses, or parasites, (e.g. *Campylobacter*, Salmonella, *Giardia*, and *Cryptosporidium*).

Disinfection kills or removes pathogens from drinking water, reducing health risks. Water can be disinfected by adding chemicals, using heat, using ultraviolet (UV) radiation, filtration, or using a combination of these methods.

When should I disinfect my drinking water?

In most cases, drinking water suppliers disinfect water to make it safe. However, you may need to disinfect your own drinking water, or find an alternate source such as bottled water if your community is on a 'boil water' notice. This may be because:

- The water does not have adequate treatment.
- Tests show the presence of "fecal coliform" or *E. Coli* bacteria, an indicator of human or animal waste.
- A flood, earthquake, or other event has disrupted the water supply in your community.

You may also need to disinfect your water if:

- You are on your own well.
- You are travelling in an area where the safety of the water is questionable.
- You have a weakened immune system.

What is the best way to disinfect water?

Boiling water is the most effective way to disinfect water, particularly if you think your water has parasites such as *Giardia* or *Cryptosporidium*, or if you have a weakened immune system.

- Boil water for at least 1 minute. At elevations over 2,000 meters (6,500 feet) boil water for at least 2 minutes.
- Store disinfected water in clean, covered, food grade containers.

Can I use bleach to disinfect water?

Yes. Household chlorine bleach kills most pathogens.

- Do not use scented bleaches, colour-safe bleaches, bleaches with added cleaners, or non-chlorine bleach.
- Bleach works best when added to warm water that is about 20˚C (68˚F). Mix 2 drops (0.1 mL) of household bleach (about 5.25% chlorine) with 1 litre of water, then cover and let stand for 30 minutes before drinking. You should notice a slight chlorine smell after the 30 minutes. If not, add another 2 drops. Let the water stand for another 15 minutes.
- If the water is cloudy, or colder than 10˚C (50˚F), double the amount of bleach added. Cover it and let it stand for 1 to 2 hours before drinking. The longer the treated water stands the better it works to disinfect the water.
- To reduce chlorine taste, let the water stand uncovered for a few hours, or pour it back and forth from one clean container to another several times.
- If using chlorine tablets, follow the directions on the package.

What if the water is heavily contaminated or polluted with chemicals?

Boiling water or adding bleach does not make heavily contaminated water safe because it does not remove chemicals. You must find an alternate source of water.

What if the water is cloudy or murky?

Cloudiness can be reduced by pouring the water through a clean cloth or coffee filter before disinfecting the water. Let any remaining bits settle to the bottom. Pour off the clear water into clean containers.

Can I use iodine to disinfect water?

Yes, but only for short periods of time. There are potential health concerns (thyroid problems or iodine sensitivity) associated with long-term iodine use. Children and pregnant women are especially sensitive and should avoid using iodine to disinfect water.

- Iodine works best when added to warm water that is about 20˚C (68˚F). Mix 6 drops (0.3 mL) of 2% Tincture of Iodine with 1 litre of clear untreated water. Let stand for 30 minutes before drinking. If water is cold or cloudy, add 10 drops (0.5 mL) of 2% Tincture of Iodine with 1 litre of water and let stand for several hours before drinking.
- If using iodine tablets, follow the directions on the package.

Can I use a water filter to disinfect water?

Jug-type water filters (such as Brita®), are not made to remove pathogens from an unsafe water supply, however you may consider using a treatment device that is certified to kill or remove pathogens. For information on certification of treatment devices, visit National Sanitation Foundation (NSF) at www.nsf.org.

What should I use disinfected water for?

If you need to disinfect your water, use treated or bottled water for the following activities:

- Drinking and food preparation. This includes cleaning raw vegetables and fruit, as well as making baby formula,
- drink mixes such as juice concentrates or drink crystals,
- coffee, and
- ice cubes (freezing does not kill or remove pathogens).
- Hand washing dishes. If using a dishwasher that does not have a hot or sanitation cycle, soak the dishes afterwards for 1 minute in a solution of 2 ml of bleach per litre of water.
- Brushing your teeth.
- Filling pet dishes.
- Bathing children - give sponge baths using disinfected water if it is in limited supply.

Adults can bathe using un-disinfected water, but they should not swallow the water. After bathing, wash your hands with disinfected water or use an alcohol-based hand sanitizer.

For More Information

If you have questions about your drinking water, contact your local environmental health officer or your local health authority.

For more information, see the following HealthLinkBC Files:

- HealthLinkBC File #05b Should I Get My Well Water Tested?
- HealthLinkBC File #56 Preventing Water-Borne Infections For People with Weakened Immune Systems
- HealthLinkBC File #69b Formula Feeding Your Baby: Safely Making and Storing Formula