BCHealthFiles

Number 49b
May 2007

How to Disinfect Drinking Water

Why should I disinfect my drinking water?

Drinking water is disinfected to kill bacteria, viruses and parasites, which may be in the water and may cause illness and disease.

Many different diseases are spread by contaminated drinking water, including *Campylobacter, cholera, amoebic dysentery, Giardia (beaver fever)* and *Cryptosporidia.*

These organisms usually get into drinking water supplies when source waters such as lakes or streams, community water supply pipes, or storage reservoirs are contaminated by animal wastes or human sewage.

In general, surface waters such as lakes and streams are more likely to contain disease-causing organisms than groundwater. Deep wells are safer than shallow wells. In fact, shallow dug wells are often as contaminated as lakes or streams.

When should I disinfect my drinking water?

You should disinfect your drinking water if:

- Your community has been issued a boil water advisory;
- You are using water directly from a stream, lake or shallow well;
- Lab tests of your water show that it contains "fecal coliforms";
- A flood, earthquake or other disaster has disrupted your community water supply;
- You are traveling in an area where water is not well treated; or
- You have a weakened immune system, in which case you should disinfect all of your drinking water.

Disinfecting small amounts of water

Boiling:

Boiling is the best way to kill bacteria, viruses and parasites. A full boil for at least one minute is recommended. At elevations over 2,000 meters (6,500 feet) you should boil water for at least two minutes to disinfect it. **NOTE**: This is not appropriate for water that is heavily polluted or subject to chemical contamination.

Disinfection using chemical methods:

Unscented household bleach with 5% chlorine can sometimes be a good disinfectant. For example, this may work when the water is ***not*** heavily polluted, or when *Giardia* or cryptosporidiosis are ***not*** a concern.

Bleach does not work well in killing off *Giardia* or beaver fever or Cryptosporidium parasites. The amount of bleach needed to kill these parasites makes the water almost impossible to drink. If Cryptosporidium or *Giardia* are in your water, boiling is the best way to ensure safe drinking water.

Disinfection using bleach works best with warm water. Add 1 drop (0.05 mL) of bleach to 1 Litre of water, shake and allow to stand for at least 30 minutes before drinking. Double the amount of bleach for cloudy water or for cooler water.
A slight chlorine odour should still be noticeable at the end of the 30-minute waiting period if you have added enough bleach. The longer the water is left to stand **after** adding bleach, the more effective the disinfection process will be.

Chlorine Tablets:

Follow the manufacturers' directions.

Iodine:

Whenever possible use warm water (20˚C) and let stand a minimum of 20 minutes after mixing and before drinking. For cold water (5 - 15˚C) increase the waiting time after mixing to 40 minutes. If you are using 2% tincture of iodine, use 10 drops (0.5 mL) for every one litre of water. With iodine tablets, follow the manufacturer's directions.

Note: Pregnant women should not use iodine drops to purify water as it may have an effect on the fetus.
Iodine should not be used to disinfect water over long periods of time as prolonged use can cause thyroid problems.

Disinfecting large amounts of water

Always use clean containers designed for storage of food or water. You can use regular household bleach (usually about 5% chlorine) or commercial bleach products (usually 10% chlorine).

The table below shows how much regular household bleach to add to various size water containers *to disinfect relatively clean water*. If you are treating water from a lake, stream or shallow well, use twice as much household (5%) bleach as indicated in the chart below and wait twice as long before drinking it because it is more likely to contain chlorine-resistant parasites from animal droppings.

Let the water stand for at least an hour after adding the bleach before you start drinking it. If the water is colder than 10˚C or has a pH higher than 8, let the water stand for at least two hours before drinking.

Gallons of water to disinfect (equivalent shown in brackets)	**Amount of household bleach (5%) to add ***
1 *gal*. (4.5 *litres*)	2 drops (0.18 *mL*)
2 1/5 *gal*. (10 *litres*)	5 drops (0.4 *mL*)
5 *gal*. (23 *litres*)	11 drops (0.9 *mL*)
10 *gal*. (45 *litres*)	22 drops (1.8 *mL*)
22 *gal*. (100 *litres*)	3/4 teaspoon (4 *mL*)
45 *gal*. (205 *litres*)	1 1/2 teaspoons (8 *mL*)
50 *gal*. (230 *litres*)	1 3/4 teaspoons (9 *mL*)
100 *gal*. (450 *litres*)	3 1/2 teaspoons (18 *mL*)
220 *gal*. (1000 *litres*)	8 teaspoons (40 *mL*)
500 *gal*. (2200 *litres*)	6 tablespoons (90 *mL*)
1000 *gal*. (4550 *litres*)	6 1/2 ounces or 12 tablespoons (180 *mL*)

*Adding household (5%) bleach at these amounts will produce water with about 2 parts per million of chlorine in it (about 0.0002 percent).

If you have any questions about your drinking water, please contact your local Drinking Water Officer or Health Authority.

For more BC HealthFile topics, visit www.healthlinkbc.ca/healthfiles/index.stm or your local public health unit.

Click on www.healthlinkbc.ca or call **8-1-1** for non-emergency health information and services in B.C.

For deaf and hearing-impaired assistance, call **7-1-1** in B.C.

Translation services are available in more than 130 languages on request.