

## How to Disinfect Drinking Water

### Why should I disinfect my drinking water?

Drinking water is disinfected to kill disease-causing micro-organisms (bacteria, viruses and parasites), which may be in it.

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

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

In general, surface waters such as streams and lakes 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";
- An earthquake or other disaster has disrupted your community water supply;
- You are traveling in an area where water is not well treated (third world countries); 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 obviously heavily polluted, or subject to chemical contamination.

To remove the flat taste of boiled water, leave the boiled water in a clean covered container for a few hours or pour the cooled boiled water back and forth from one clean container to another.

#### Disinfection using chemical methods:

Unscented household bleach (5% chlorine) can sometimes be a good disinfectant - e.g. when the water is **not** heavily polluted, or when beaver fever or cryptosporidiosis are **not** a concern.

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 disinfection action of bleach depends as much on the waiting time after mixing as to the amount used. The longer the water is left to stand **after** adding bleach, the more effective the disinfection process will be. **NOTE: Bleach does not work well in killing off beaver fever (Giardia) or Cryptosporidium parasites.** The amount of bleach needed to kill these parasites makes the water almost impossible to drink. If beaver fever or Cryptosporidium are in your water, boiling is the best way to ensure safe drinking water.

#### 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.

**PLEASE 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.**

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**Disinfecting larger amounts of water in tanks or barrels**

Always use clean containers that are 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.

<b>Gallons of water to disinfect (equivalent shown in brackets)</b>	<b>Amount of Household bleach (5%) to add *</b>
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 environmental health officer.**

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