Making Water Safe in an Emergency

cdc.gov/healthywater/emergency/making-water-safe.html

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Español (Spanish)

In an emergency, water contaminated with germs can often be made safe to drink by boiling, adding disinfectants, or filtering.

IMPORTANT: Water contaminated with fuel or toxic chemicals will not be made safe by boiling or disinfection. Use bottled water or a different source of water if you know or suspect that your water might be contaminated with fuel or toxic chemicals.

In emergency situations, use bottled water if possible; bottled water is the safest choice for drinking and all other uses. If bottled water is not available, the following methods can help make your water safe to drink.

*Note: These methods are listed in order of what is most effective at making your water safe.

1. Boiling

Printable Fact Sheet: Making Water Safe [625 KB] (English)

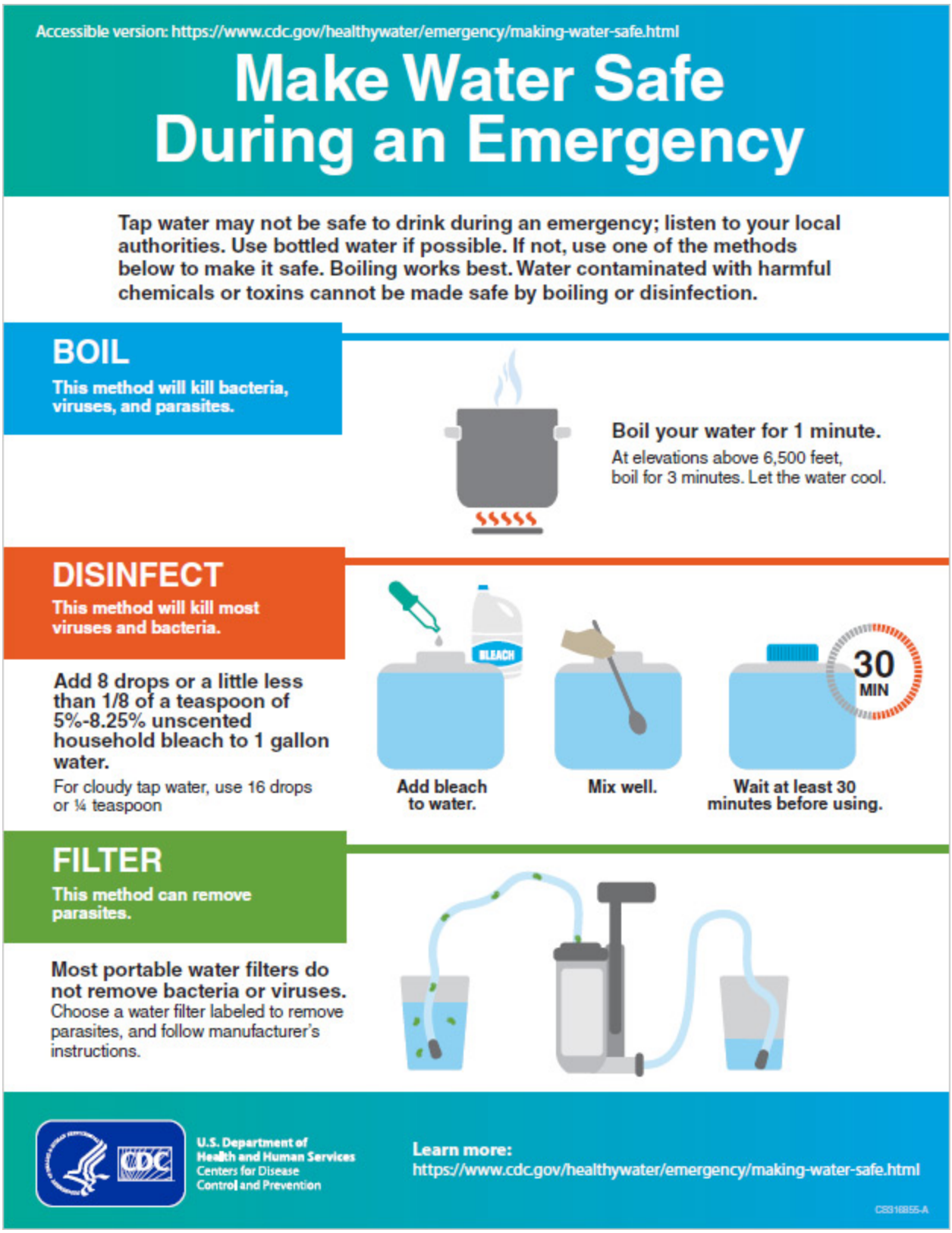
Printable Fact Sheet: Making Water Safe [627 KB] (Español)

If you don't have safe bottled water, you should boil your water to make it safe to drink. Boiling is the surest method to kill disease-causing organisms, including viruses, bacteria, and parasites.

You can improve the flat taste of boiled water by pouring it from one container to another and then allowing it to stand for a few hours; OR by adding a pinch of salt for each quart or liter of boiled water.

If the water is cloudy:

1. Filter it through a clean cloth, paper towel, or coffee filter OR allow it to settle.



2. Draw off the clear water.
3. Bring the clear water to a rolling boil for 1 minute (at elevations above 6,500 feet, boil for three minutes).
4. Let the boiled water cool.

5. Store the boiled water in clean sanitized containers with tight covers.

If the water is clear:

1. Bring the clear water to a rolling boil for 1 minute (at elevations above 6,500 feet, boil for three minutes).
2. Let the boiled water cool.
3. Store the boiled water in clean sanitized containers with tight covers.

2. Disinfectants

If you don't have safe bottled water and if boiling is not possible, you often can make small quantities of filtered and settled water safer to drink by using a chemical disinfectant such as unscented household chlorine bleach.

Disinfectants can kill most harmful or disease-causing viruses and bacteria, but are not as effective in controlling more resistant organisms, such as the parasites *Cryptosporidium* and *Giardia*. Chlorine dioxide tablets can be effective against *Cryptosporidium* if the manufacturer's instructions are followed correctly.

If the water is contaminated with a chemical, adding a disinfectant will not make it drinkable.

To disinfect water with unscented household liquid chlorine bleach:

If the water is cloudy:

1. Filter it through a clean cloth, paper towel, or coffee filter OR allow it to settle.
2. Draw off the clear water.
3. Follow the instructions for disinfecting drinking water that are written on the label of the bleach.
4. **If the necessary instructions are not given**, check the "Active Ingredient" part of the label to find the sodium hypochlorite percentage; and use the information in the following table as a guide. Typically, unscented household liquid chlorine bleach in the United States will be between 5 and 9% sodium hypochlorite, though concentrations can be different in other countries. Using the table below, add the appropriate amount of bleach using a medicine dropper, teaspoon, or metric measure (milliliters).
5. Stir the mixture well.
6. Let it stand for at least 30 minutes before you use it for drinking.
7. Store the disinfected water in clean, sanitized containers with tight covers.

If the water is clear:

1. Follow the instructions for disinfecting drinking water that are written on the label of the bleach.
2. **If the necessary instructions are not given**, check the "Active Ingredient" part of the label to find the sodium hypochlorite percentage; and use the information in the following table as a guide. Typically, unscented household liquid chlorine bleach in the United States will be between 5 and 9% sodium hypochlorite, though concentrations can be different in other countries. Using the table below, add the appropriate amount of bleach using a medicine dropper, teaspoon, or metric measure (milliliters).
3. Stir the mixture well.
4. Let it stand for at least 30 minutes before you use it for drinking.
5. Store the disinfected water in clean, sanitized containers with tight covers.

If you have a dropper: Add 2 drops of bleach	If you have a dropper: Add 8 drops of bleach	If you have a dropper: Add 40 drops of bleach
If you have something that measures milliliters (mL): Add 0.1 mL of bleach	If you have something that measures milliliters (mL): Add ½ mL of bleach	If you have something that measures milliliters (mL): Add 2½ mL of bleach
If you have a measuring spoon: Amount too small to measure	If you have a measuring spoon: Add a little less than 1/8 teaspoon	If you have a measuring spoon: Add ½ teaspoon of bleach

Making water safe to use with bleach having a 5%-9% concentration of sodium hypochlorite (most common in the US). If the water is cloudy, murky, colored, or very cold, add double the amount of bleach listed below.

If you have a dropper: Add 10 drops of bleach	If you have a dropper: Add 40 drops of bleach	If you have a dropper: Add 200 drops of bleach
If you have something that measures milliliters (ml): Add ½ mL of bleach	If you have something that measures milliliters (ml): Add 2½ mL of bleach	If you have something that measures milliliters (ml): Add 12½ mL of bleach
If you have a measuring spoon: Add ⅛ teaspoon of bleach	If you have a measuring spoon: Add ½ teaspoon of bleach	If you have a measuring spoon: Add 2½ teaspoons of bleach

Making water safe to use with bleach having a 1% concentration of sodium hypochlorite (this concentration is not common in the US, but is used in other countries). If the water is cloudy, murky, colored, or very cold, add double the amount of bleach listed below.

Tablets can be used to disinfect water and are popular among campers and hikers, as well as in other countries. They are available in different sizes and made to treat specific amounts of water. **To disinfect water with tablets:**

Follow the manufacturer's instructions on the label or in the package.

- **Chlorine dioxide tablets can be effective against *Cryptosporidium* if the manufacturer's instructions are followed correctly.**
- Iodine and iodine-containing tablets (tetraglycine hydroperiodide) or chlorine tablets are not effective against *Cryptosporidium*. **Water that has been disinfected with iodine is NOT recommended for pregnant women, people with thyroid problems, those with known hypersensitivity to iodine, or for continuous use for more than a few weeks at a time**.

3. Filters

Many portable water filters can remove disease-causing parasites such as *Cryptosporidium* and *Giardia* from drinking water.
If you are choosing a portable water filter:

Try to pick one that has a filter pore size small enough to remove parasites (such as *Giardia* and *Cryptosporidium*). Most portable water filters do not remove bacteria or viruses.

- Carefully read and follow the manufacturer's instructions for the water filter you intend to use.
- After filtering, add a disinfectant such as iodine, chlorine, or chlorine dioxide to the filtered water to kill any viruses and remaining bacteria.

For more information about water filters that can remove parasites, see the CDC's A Guide to Water Filters.

Other Methods

To learn more about other methods of water treatment visit CDC's Traveler's Health Water Disinfection page and the FEMA/American Red Cross Guide Food and Water in an Emergency [PDF – 803 KB].

More Information

- EPA. Emergency Disinfection of Drinking Water. Guidelines in emergency disinfection of drinking water with PDF documents in English, Spanish, French, Arabic, and Vietnamese.

- EPA. Safe Drinking Water Hotline (800-426-4791).
- CDC. A Guide to Water Filters.
- CDC**.** A Guide to Drinking Water Treatment Technologies for Household Use
- CDC. A Guide to Drinking Water Treatment and Sanitation for Backcountry and Travel Use covers information on the effectiveness of various water treatment methods. This guide is also available in PDF: Drinking Water Treatment Methods for Backcountry and Travel Use. [PDF – 869 KB]
- CDC. A Guide to Commercially-Bottled Water and Other Beverages.