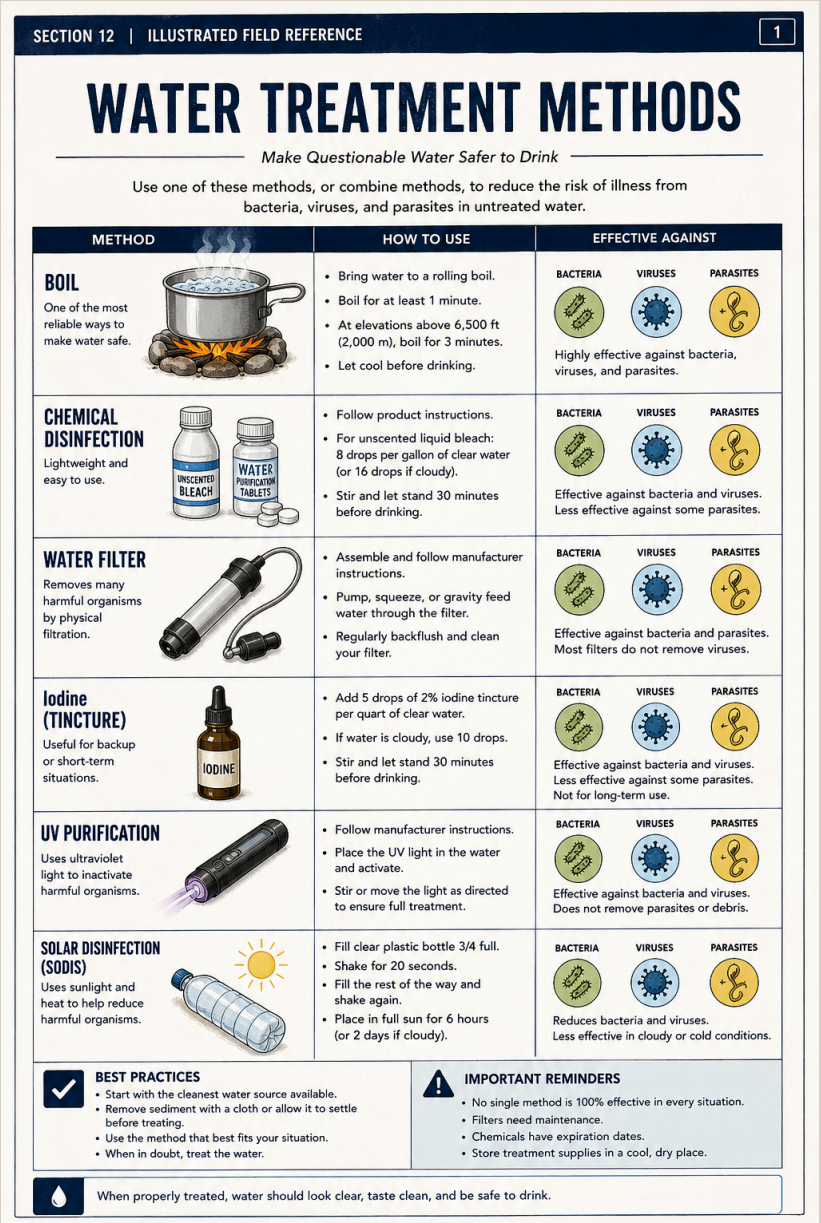
FIELD GUIDE · NO. 01

Water Treatment Methods

Make questionable water safer to drink — and know what treatment cannot fix.



SECTION 12 | ILLUSTRATED FIELD REFERENCE 1

WATER TREATMENT METHODS

Make Questionable Water Safer to Drink

Use one of these methods, or combine methods, to reduce the risk of illness from bacteria, viruses, and parasites in untreated water.

METHOD	HOW TO USE	EFFECTIVE AGAINST
BOIL One of the most reliable ways to make water safe.	• Bring water to a rolling boil. • Boil for at least 1 minute. • At elevations above 6,500 ft (2,000 m), boil for 3 minutes. • Let cool before drinking.	BACTERIA VIRUSES PARASITES Highly effective against bacteria, viruses, and parasites.
CHEMICAL DISINFECTION Lightweight and easy to use.	• Follow product instructions. • For unscented liquid bleach: 8 drops per gallon of clear water (or 16 drops if cloudy). • Stir and let stand 30 minutes before drinking.	BACTERIA VIRUSES PARASITES Effective against bacteria and viruses. Less effective against some parasites.
WATER FILTER Removes many harmful organisms by physical filtration.	• Assemble and follow manufacturer instructions. • Pump, squeeze, or gravity feed water through the filter. • Regularly backflush and clean your filter.	BACTERIA VIRUSES PARASITES Effective against bacteria and parasites. Most filters do not remove viruses.
Iodine (TINCTURE) Useful for backup or short-term situations.	• Add 5 drops of 2% iodine tincture per quart of clear water. • If water is cloudy, use 10 drops. • Stir and let stand 30 minutes before drinking.	BACTERIA VIRUSES PARASITES Effective against bacteria and viruses. Less effective against some parasites. Not for long-term use.
UV PURIFICATION Uses ultraviolet light to inactivate harmful organisms.	• Follow manufacturer instructions. • Place the UV light in the water and activate. • Stir or move the light as directed to ensure full treatment.	BACTERIA VIRUSES PARASITES Effective against bacteria and viruses. Does not remove parasites or debris.
SOLAR DISINFECTION (SODIS) Uses sunlight and heat to help reduce harmful organisms.	• Fill clear plastic bottle 3/4 full. • Shake for 20 seconds. • Fill the rest of the way and shake again. • Place in full sun for 6 hours (or 2 days if cloudy).	BACTERIA VIRUSES PARASITES Reduces bacteria and viruses. Less effective in cloudy or cold conditions.

BEST PRACTICES
- Start with the cleanest water source available.
- Remove sediment with a cloth or allow it to settle before treating.
- Use the method that best fits your situation.
- When in doubt, treat the water.

IMPORTANT REMINDERS
- No single method is 100% effective in every situation.
- Filters need maintenance.
- Chemicals have expiration dates.
- Store treatment supplies in a cool, dry place.

When properly treated, water should look clear, taste clean, and be safe to drink.

FROM THE BOOK

1. Clear water is not necessarily safe. Bacteria, viruses, and parasites cannot be seen, so unless you know exactly where the water came from and how it has been protected, treat it before you drink.
2. Start with the cleanest source you can find. Let sediment settle, or pour the water through a clean cloth or coffee filter first. That step alone does not make the water safe, but it helps boiling, filters, and chemical treatment work better.
3. Boiling is one of the most dependable ways to destroy bacteria, viruses, and parasites in untreated freshwater. A vigorous rolling boil is the important step. At elevations above about 6,500 feet (2,000 meters), where water boils at a lower temperature, let it boil longer for an added margin of safety. Then cool it and store it in a clean container.
4. A backpacking filter can remove many bacteria and parasites from natural freshwater, but most standard filters are not designed to remove viruses or dissolved chemicals. Follow the manufacturer's instructions, and clean or backflush the filter as recommended.
5. Chemical disinfection (purification tablets or unscented household bleach) inactivates many disease-causing organisms, but it needs time to work — especially in very cold or cloudy water. Use unscented bleach only, and follow the product label or the dosage chart in the book rather than memorizing a single number. Iodine should not be used by anyone with a thyroid condition or iodine allergy, by pregnant women, or as a long-term method.
6. Boiling, filters, and chemical treatment address biological contamination. They do not remove gasoline, pesticides, heavy metals, salt, or seawater. If you suspect chemical contamination, find another source whenever you can.

PRACTICE IT

Before you need it, practice treating a bottle of water with the method you actually carry — boiling, a filter, or tablets — so the steps are familiar. Keep untreated and treated water in separate containers.