

## Backcountry Water Treatment Methods

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<b>Basic Treatment Method</b>	<b>Treatment Time</b>	<b>Examples</b>	<b>Limitations/Comments</b>
<b>BOILING</b>			
Boiling and heating	Depends upon quantity and heat source		Some claim effective treatment at temps below boiling (e.g., 180 degrees). Boiled water tastes flat; takes extra time and fuel especially at altitude; not want to drink hot liquids in hot and humid temps; lack of agreement about boiling times and temps; pouring scalding water
<b>FILTERS and PURIFIERS</b>			
Standard filters of 0.3 micron or less in bottle and pump form	Variable depending upon type used	Katahdyn Hiker Pro, Mini, Pocket, Vario or Combi; MSR HyperFlow, MiniWorks or SweetWater; Sawyer Squeeze Filter	Most common treatment method; heavier than other methods; can be problematic and unreliable; can be slow and tiresome; retains water that could freeze; not meet EPA standards for purification (especially for viruses); Sawyer Squeeze filters down to 0.1 microns
Gravity systems using filter cartridge	Variable	Platypus Gravity Works System; Katadyn Drip Gravidyn; MSR Autoflow Gravity Filter; Sawyer Point One Biological Filter	No weight advantage over standard filter systems; usually much slower than other methods; suitable for larger groups
Standard filter supplemented with chemical disinfectant (e.g., iodinated resin)	Variable	Katadyn Exstream XR or MyBottle Purifier; Sawyer Treatment Bottle	
Straw with embedded hollow fiber filter	Variable	Lifestraw	Treatment at point-of-consumption rather than point-of-source; easy sucking through hollow fibers—no pump; developed primarily for third world countries; cheap and light
Specialized micro-filters or electrochemically charged filter material that meets EPA standards for purification	Variable	First Need XL purifier; Sawyer PointTwoZero purifier	
<b>CHEMICAL DISINFECTANT</b>			
Iodine (Hydroperiodide) in either liquid or tablet form	30 minutes or more in cold, cloudy water	Polar Pure; Potable Aqua Plus; Coghlan's Two Step Water Treatment	must be stored in glass; chemical taste that can be neutralized; kills viruses, bacteria, protozoa (except cryptosporidia); must filter out organic matter

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Chlorine dioxide in either liquid or tablet form (not same as Chlorine bleach)	15-240 minutes*	AquaMira liquids and tablets; Potable Aqua tablets; Katadyn Micropur tablets	Kills viruses, bacteria, protozoan cysts (including cryptosporidia); some report chlorine taste in tablet form; must first filter out organic matter; liquid form needs pre-mixing of two-part solution; tablets expensive for regular use; often used as backup to other methods; must wait at least 15 minutes (longer in cold water and when using tablets)
Powdered calcium hypochlorite (chemical disinfectant and chemical flocculant)	30 minutes	PUR Clean Drinking Water Kit; Reliance PUR Purifier	Relatively new and expensive; cloth removes turbidity and sediment
Sodium dichloroisocyanurate tablets	30 minutes	MSR Aquatabs	Each tablet is sufficient to treat up to 2 liters of water; formulation sometimes used to disinfect swimming pools; not effective against Cryptosporidium
Electrically activated salt-based solution creates mix of oxidants (free chlorine)	15-240 minutes*	MSR MIOX Water Purifier	Needs batteries; relatively fragile and expensive; pre-filter out larger pollutants to work well; treat large volumes; requires disposable testing strips; more complicated process; used by US Army
<b>ULTRAVIOLET LIGHT STERILIZER</b>			
Ultraviolet light (pen or unit integrated into container cap)	90 seconds per liter; 48 seconds for half liter	SteriPen Adventurer Opti; AquaStar Plus; CamelBak All Clear	Fast; no residual tastes; must filter out sediment and organics or let settle to work effectively; relatively fragile and expensive; needs batteries; pen not work in small neck bottles less than 1.75" inside diameter; will not kill some nasties (e.g., tapeworms)
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*Destroys viruses and bacteria in 15 minutes, Giardia in 30-minutes and Cryptosporidia in 4-hours in cold, cloudy water with standard dosage; halve the dosage and double the treatment time, or double the dosage and halve the treatment time.			