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SPERO News

SAFE • PREPARED • EQUIPPED

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Let's Work Together

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Water is life!

Water is essential to life. Any living species on planet Earth needs it to survive, be it mankind, animal, plant or microorganism.

Water is one of the fundamental element for life, yet we often take it for granted. Having access to clean water seems as simple as turning on a tap. But what happens if nothing comes out anymore?

In this issue we will go through the two types of water you should consider in an emergency situation: **drinkable and comfort/sanitation water.**



Drinkable water

Make sure your family always has drinkable water, no matter what. Store water at home, in your car and at your workplace and have bottles ready in your emergency kits including your kids and pets bags.

Organs, tissues and basically every cell in your body needs water to:

- carry nutrients and oxygen to your cells
- protect organs and tissues
- regulate body temperature
- cushion joints
- Get rid of wastes through urination, perspiration
- aid digestion
- maintain electrolyte (sodium) balance.

20 to 25 percent of daily fluid usually comes from other drinks and food but water will always be the best choice.

Note that some fruit and vegetables can have a particularly high proportion of water like cucumber and watermelon which contain about 90%.



According to your age water makes up 60% to 70% of your body weight.

BECOME A SPERO!

A SPERO is the Project SPE 'hero' of the family.
The person who is in charge of the emergency planning for their household. We combined
SPE : Safe, Prepared Equipped with Hero.

Join the Spero community
on our FB group
www.facebook.com/groups/safepreparedequipped

Check our website
You'll find information about how to be prepared for the unexpected
www.projectspe.com

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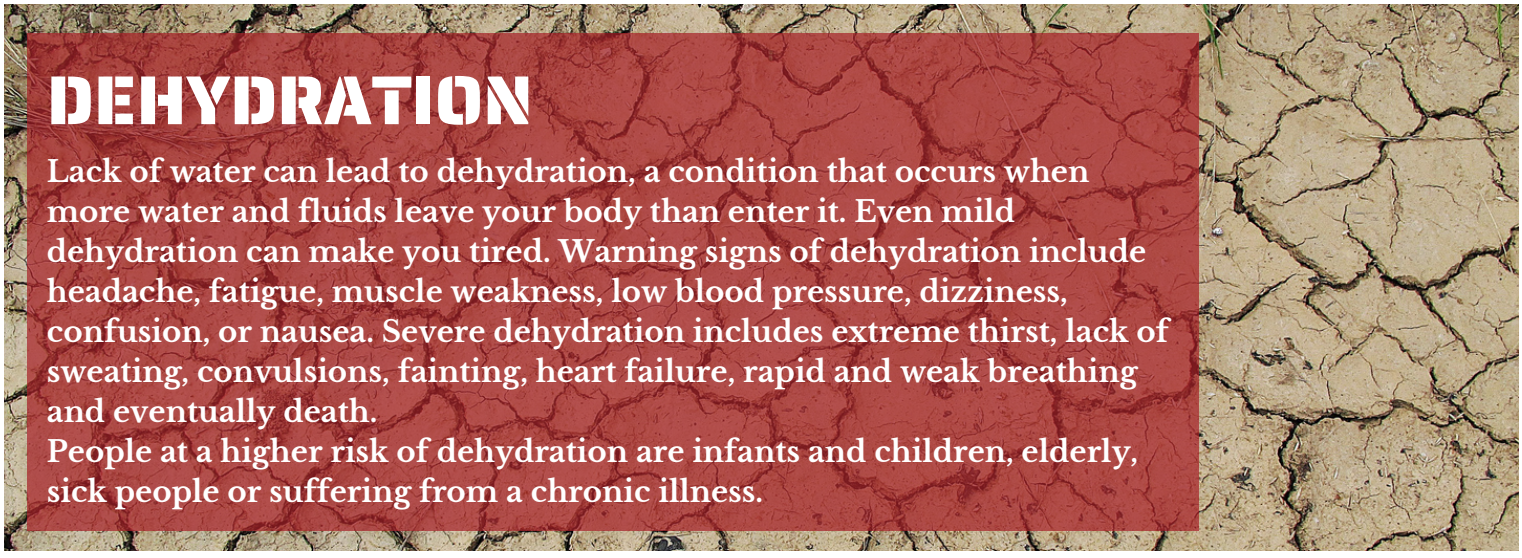
Water is essential to good health, yet needs vary according to your health and physical conditions, weight, physical activity, weather conditions and altitude (above 5000 ft your body works harder, your respiration rate goes up, and you lose water faster than you would at sea level).

The amount of fluids a child needs daily can also vary greatly, depending on age and gender as well as weather and physical activity. Remember that younger children need smaller serving quantities more often.

As a general rule, for healthy people living in temperate climates, consider the daily fluid needs in the chart below:

Age range	Gender	Daily need (cup/day)
Children		
4 to 8 years	Girls and Boys	7 (1.7 liters)
9 to 13 years	Girls	9 (2.2 liters)
	Boys	10 (2.4 liters)
14 to 18 years	Girls	10 (2.4 liters)
	Boys	14 (3.3 liters)
Adults		
	Women	15.5 (3.7 liters)
	Men	11.5 (2.7 liters)

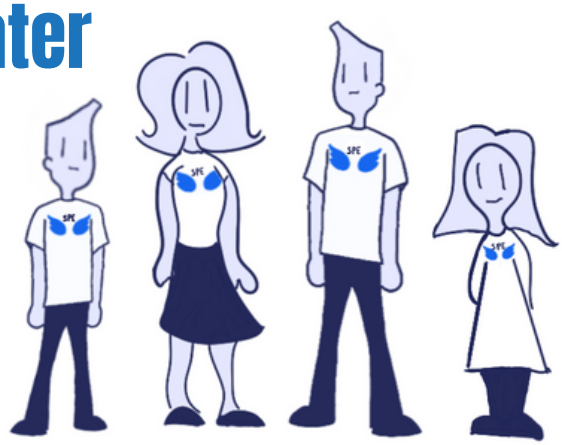
! Clean drinkable water must always be used for drinking, cooking (including washing food), washing dishes, brushing teeth.



DEHYDRATION

Lack of water can lead to dehydration, a condition that occurs when more water and fluids leave your body than enter it. Even mild dehydration can make you tired. Warning signs of dehydration include headache, fatigue, muscle weakness, low blood pressure, dizziness, confusion, or nausea. Severe dehydration includes extreme thirst, lack of sweating, convulsions, fainting, heart failure, rapid and weak breathing and eventually death.
People at a higher risk of dehydration are infants and children, elderly, sick people or suffering from a chronic illness.

Do you know how much water you use each day?



Of course water uses vary by individual, I personally run the water for 4 to 5 minutes to take a shower when my daughter would spend at least 20 minutes (if we didn't remind her to "think about the planet!").

The structure and condition of your house as well as the age of your devices will make a big difference.

Check on how much water a leaking faucet wastes on the The United States Geological Survey website: Drip Calculator
You'll be impressed!



The following is an estimate but it will give you an idea of how much water you use:

Bath 40 to 60 gallons.
Tip: take showers instead of baths.

Shower About 2,5 gallons per minute (that's 20 gallons of water for the average shower according to the EPA).
Tip: use a low-flow shower-head shower.

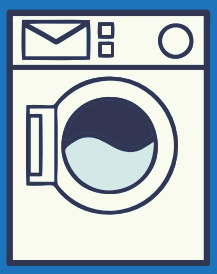
Teeth brushing 0,5 to 1 gallon.
Tip: turn the faucet off when brushing teeth.

Hands washing About 1 gallon
Tip: installing a faucet-head aerator will use less water thanks to the introduction of small bubbles to the water flow (5 to 15$ as average price).

Dishwasher 8 to 16 gallons per load, 3 to 6 gallons for EnergyStar rated models (they also save electricity).
Tip: dishwashing by hand uses actually more water: up to 27 gallons for the same load (depending on how efficient you are, of course!), unless you instal a faucet-head aerator and don't let the water run while you wash every dish.

Clothes washer 15 to 30 gallons per load for newer washers, up to 45 gallons per load for older models.
Tip: energyStar rated washers save a lot of water and electricity.

Toilet flush New toilets use 1.6 gallons per flush, 3 to 4 gallons for older ones.
Tip: check for leaks and install a new low-flow toilet.





SOURCES OF WATER AT HOME



The first thing you need to know is where your incoming water valve is. If you receive a warning or a report of broken sewage lines or any other potential sources of water contamination, or after an earthquake, shut it off before turning on any faucet in your house to stop polluted water from entering your home water system.

Hot water tank

Home water heater tanks usually contain 40 to 75 gallons of water. This water is clean so you should shut off the water supply line to the heater (located at the top of the tank) to avoid a potential contamination from the public water network. The temperature set in a water heater should be between 130 and 140 degrees Fahrenheit (55 to 60 degrees Celsius), make sure to turn off the gas or electricity to the water tank and wait for the water to cool down. Open the pressure relief valve at the top of the tank and turn on the drain valve at the bottom. Do not turn on electricity or gas when the tank is empty.

Home water pipes

Water is held under pressure in the pipe and is literally waiting behind the faucet valve. To use the remaining water in your home pipes, turn on the faucet at the highest level in your house to let air into the plumbing system and create natural pressure, turn on the faucet at the lowest level to collect the water. You should be able to collect another gallon of water (for a one story house).

Freezer

Ice cubes from your freezer are obviously safe to drink. Depending on how clean your freezer is, you can collect the built up ice inside (which is, by the way, a sign that the freezer drain might be clogged).

Toilet tank (not the bowl!)

It might sound odd but your toilet tank is another source of water you can use. If no cleaning product is being used in the tank, it will provide a couple of gallons of clean water (pre-1982 toilets hold 5 to 7 gallons, toilets between 1982 and 1993 hold around 3.5 gallons, and the new ones hold 1.6 gallons).

Rainwater

If you have a rainwater collection system or if you are improvising one with tarp, duct tape and containers, you will have access to an additional source of water. Remember that this water might not be safe to drink (depending on the collection method and air pollution) and that you will have to treat it before use.

Veggies and fruits can

Canned veggies and fruit contain water that you can drink, unless it contains brine.

If you collect water from these unusual emergency sources, always treat it first if you want to use it for drinking, cooking or even brushing your teeth.

SOURCES YOU SHOULD NOT USE FOR DRINKABLE WATER



Garden hose

Some water could be sitting in your garden hose, in addition to bacteria, mold, and other microorganisms, the heat from the sun can increase the leaching of chemicals from the PVC into the water.

Swimming pool and spa

Due to the amount of chemicals including chlorine present in pool water and spa, it is not recommended for safe human consumption.

Waterbeds

Fungicides and other chemicals make the water unsafe to drink.

Flooded well

Few people know that the water in a flooded well is no longer safe to drink. You should test the purity of water after a major flood and sterilize the well if the water contains unsafe levels of contaminants. Search online for "well shock" and "well chlorination shocking" methods or ask a professional to do it.

Condensate from an air conditioning system or a dehumidifier

According to the Environmental Protection Agency, stagnant condensate can be contaminated by organic substances, including mold, mildew and algae, it can moreover contain metal residues like lead from the component parts of the device.

Always consider flood water unsafe

During floods, from heavy rains, snow melt, high river levels and high tides water comes into contact with things it shouldn't, such as sewage, fuel, animal waste, chemicals from industrial facilities and more. If you have a private drinking water well that has been impacted, it may have been contaminated with pollutants carried in the flood water. Don't use its water for personal consumption unless the well has been properly disinfected and then tested for drinking safety.

Drinking seawater can be deadly

Your body normally gets rid of excess salt by having the kidneys produce urine. If you drink sea water, your body would have to urinate more water than you drank to get rid of all that extra salt leaving. While humans can safely ingest small amounts of salt as part of a daily diet, the salt content in seawater is much higher than what can be processed by the human body. Your body needs freshwater to dilute the salt for the kidneys to work properly. If you drink seawater, your kidneys would have to urinate more water than you drank to filter and get rid of all the excess salt. You will be thirstier than you were before and become dehydrated which can quickly become a deadly situation.

Yes, you can treat and drink the water from the toilet tank and flush it with the pool water ...
This is called emergency management!

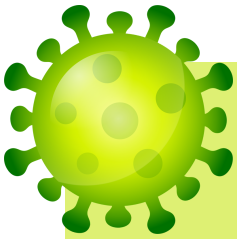
! Even though you could treat water from these sources, you should not consume it but use it for sanitation purposes: personal hygiene and toilet flushing.

WATER CONTAMINATION

After a disaster, water supplies can be damaged or interrupted, your regular water source could be cut-off or compromised through contamination and clean drinking water may not be available for a few days or weeks. Even if you have access to water, you need to be sure that it is safe for drinking, cooking, washing dishes or brushing your teeth. Without clean water, things can turn nasty very fast.

According to the World Health Organization, 829 000 people die each year from diarrhea as a result of unsafe drinking-water, poor sanitation and hygiene conditions.

TYPES OF CONTAMINATION

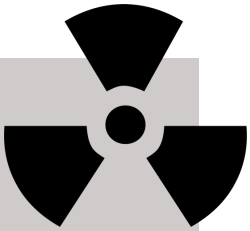


BIOLOGICAL

Water can be contaminated by organic substances like bacteria and parasites that cause diseases dysentery, typhoid, hepatitis, and intestinal disorders leading to diarrhea and, therefore, a high risk of dehydration.

In case of a disaster water lines might be damaged and contaminated by the underground sewage pipes.

CHEMICAL



It can also be contaminated by chemical pollutants caused by leaking fuel tanks, industrial waste, pesticides, and corroded water pipes.

Contaminated water could have a bad odor or a dark color, it can also have no evident signs of pollution. If you have any suspicion or even doubt on its quality, you must purify it before using it.

WATER TREATMENT

If you are out of drinkable bottled water you will have to produce your own, **this process will take some time and you have to anticipate your family's needs for drinking water**.

Before treating and storing water, make sure you have clean and appropriate containers for drinkable water.

! A best practice to produce potable water requires two steps: filtering + disinfecting.

FILTRATION

Many homes have installed water filters that can remove sediments, rust, chemicals, heavy metals, and microorganisms from tap water. If the city water is cut off you can use portable filters that will allow you to treat the water you have found in those unusual sources we have previously mentioned.

There are a lot of different types and models of portable water filters on the market: pump filters, bottle filters, gravity filters, straw filters, they are usually made for backpacking, camping and other outdoor activities.

Just like for any other emergency items, its function must meet your personal needs and environment, you need to know how it works and test it before you need it in an emergency situation.

Filtration rate are expressed in microns. To give you an idea of the corresponding sizes, check out the following chart:

Particle types	Size in microns
Beach sand	100 - 2000
Human hair	70
Dust	40
Bacteria	3
Lead dust	2
Viruses	0.005 - 0.3

When selecting a filtration system, another features that need to be considered when selecting a portable water filter are its capacity (how much water can be filtered), the lifespan of the filter, the convenience (straw, pump, bottle...) and its portability.

DIY PROJECT



1. If water is cloudy, let it sit so particles settle on the bottom.
2. Cut the bottom of a clean plastic bottle or any suitable container (that did not previously contain any toxic product).
3. Tie a piece of clean cloth or a coffee filter to the bottleneck.
4. Fill in first with charcoal, then sand and gravel on the top.
5. Pour water in your DIY water filter and collect it in a clean container.

Check the tutorial on our instagram

Disinfection

Most filters can remove waterborne pathogens, disease-causing parasites and bacteria, some of them use active carbon that can absorb certain chemicals, and organic chemicals from water. However, they will not remove viruses, which are too small.

Pasteurization

Pasteurization does not sterilize water, but it reduces pathogen loads making the water safe to be drunken. One of the reasons why you will decide to pasteurize instead of boiling is to save your heat source.

Heat the water to 149° F (65° C) for 6 to 20 minutes, or to a higher temperature for a shorter time. You can use a dedicated thermometer (like every other food related item it must be exclusively used for nutrition purpose) or a Water Pasteurization Indicator (WAPI), a wax-actuated thermometer that indicates when water has reached pasteurization temperature.

Boiling

Boiling is one of the oldest proven methods to disinfect water by killing the most common pathogens, like viruses, and bacteria that can cause diseases.

Bring water to a rolling boil for 3 to 5 minutes. At sea level, water boils at 212 °F (100 °C), with each 500 feet increase in elevation, the boiling point of water is lowered by 1°F. For example, at 5000 feet, water boils at about 203 °F.
Why is that important? After all, you know water is boiling when you see bubbles right? But it's good to know so you can manage you heat source. In an emergency situation a heat source is something valuable that you don't want to waste.

To save your heat source, as well as the water, place a lid over the container to make the water boil quicker and to reduce evaporation.

Because the level of oxygen decreases in water when it is boiling, it will taste flat. To "reoxygenate" the water, pour it back and forth between two clean containers or shake it in a closed one with air space.

Distillation

Distillation involves boiling water and collecting the resulting steam. Distilling water is the most effective way to purify water by killing microorganisms and removing salt and pollutants such as heavy metals and chemicals. Yet, this method requires a lot of heat.

1. Fill a large pot halfway with water.
2. Place a clean collection bowl in the pot.
3. Put a lid upside down, you can tie the bowl to its handle so it will stay centered under the lid.
4. Turn on the heat.
5. The steam will be trapped on the surface of the lid and drip into the cup.
6. When complete, turn off the heat and use care to remove the bowl of distilled water.

Avoid any contact between the water in the pot and the one in the collection bowl.
Extra tip: put ice cubes on top of the lid of the pot to increase the temperature difference and accelerate the process.





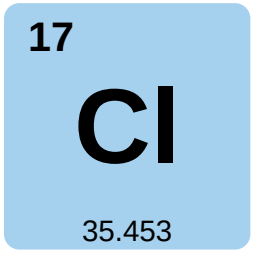
Chemical disinfection

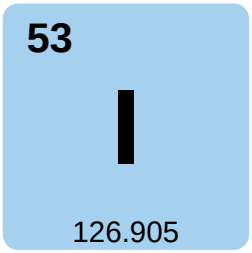
Chlorine bleach - If you can't use heat to disinfect your water, you can use household chlorine bleach to kill most harmful or disease-causing viruses and bacteria, but are not as effective in controlling more resistant organisms.

Only use unscented household liquid chlorine bleach that contains 5,25% to 6% sodium hypochlorite (do not use color safe bleaches or bleaches with added cleaners).
Add 16 drops (1/8 teaspoon) of bleach per gallon of water, stir and let it stand for 30 minutes. If the water doesn't have a slight bleach odor, repeat the process.

Be aware that household bleach has a short shelf life, it starts breaking down after six month. Keep it in a cool and dark place (sunlight will cause the active ingredients to break down). Replace it every twelve months whether you have opened your bleach bottle or not.

Sign up for the next SPERO Newsletter!
https://www.projectspe.com/
Next Issue
we will share how to build emergency kits like a pro





Iodine - You may have iodine in your medicine cabinet or first aid kit, it is generally used as an antiseptic for skin wounds. Add five drops of 2% tincture of iodine per quart or liter of water that you are disinfecting. If the water is cloudy or colored, add ten drops of iodine. Stir and let the water stand for at least 30 minutes before use.

Never use iodine to disinfect water for pregnant women, young kids or for people with allergy to iodine or thyroid disorder.

Water disinfection tablet - You can disinfect water with tablets that contain chlorine, iodine, chlorine dioxide, or other disinfecting agents. These tablets are available at pharmacies and in outdoor goods stores. Follow the instructions on the product label as each product may have a different strength.

References used to produce this issue include: American Red Cross, World Health Organization, United States Environmental Protection Agency, Center for Disease Control and Prevention, Academy of Nutrition and Dietetics .