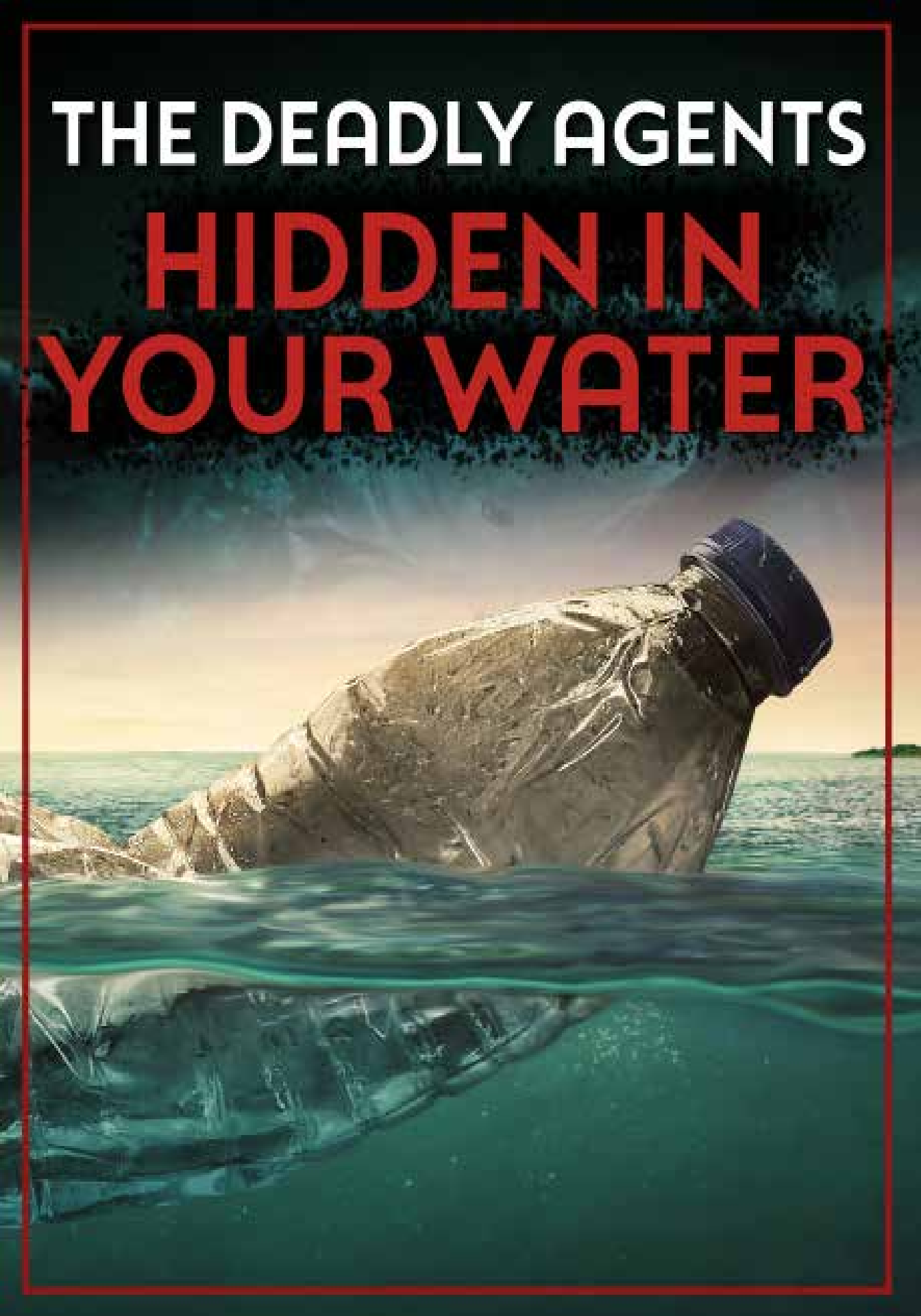
THE DEADLY AGENTS

HIDDEN IN YOUR WATER



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TOP KILLING AGENTS HIDDEN IN YOUR WATER

There may also come a time when the worst has come to pass and you’re on the run for survival. You have come across a babbling brook that just beckons to you to quench your thirst.

Though it may be perfectly safe to drink, if it’s not you can be in for a world of hurt. It’s imperative that you understand that just because your tap water LOOKS clean, you shouldn’t assume that it is.

Regardless of the water source, there’s always a chance that the water that you’re drinking is contaminated. There are many different ways that this can happen; in your home, it can be from outdated plumbing or antiquated water purification methods or equipment that doesn’t filter out modern-day contaminants such as pharmaceuticals and chemicals.

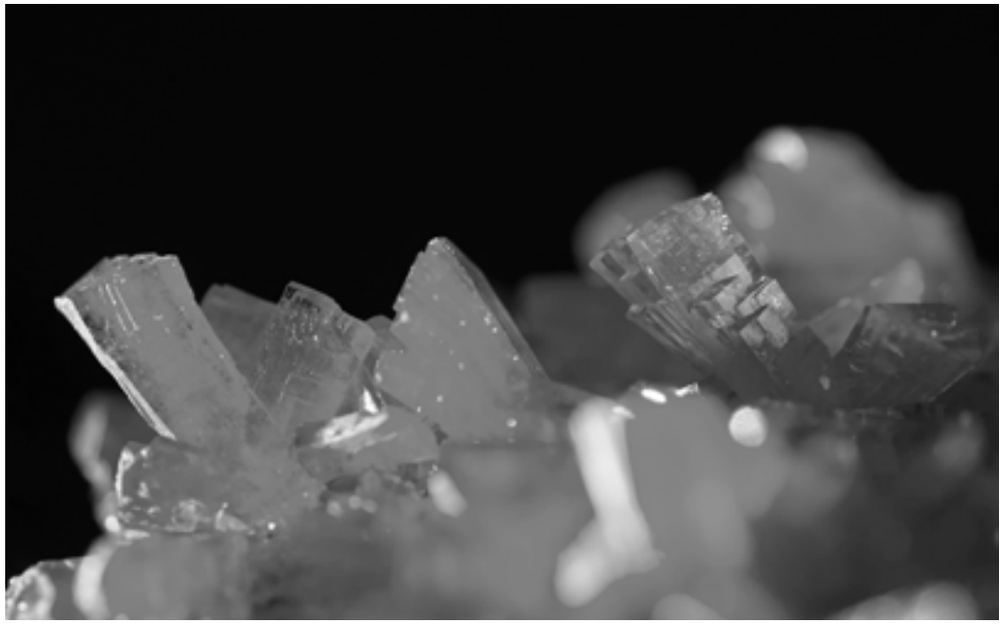
If you have a well then draught, flooding, mining activity, or hydraulic fracking in the area can disrupt the water tables and contaminate your water.

Streams and other unpurified water sources can be polluted by chemicals, pesticides, antibiotics, and fertilizers caused by runoff from nearby industrial plants or farms. They are also vulnerable to leaky sewage systems, as well as animal defecation, and even acid rain and smog can pollute water.

Don't worry though — today we're going to tell you about the top pollutants and contaminants found in water so that you know what to test for.

According to some sources, water contamination makes 2 million Americans sick every year and that number will increase exponentially if SHTF.

Hexavalent Chromium



Remember the Erin Brokovich story that took place in Hinckley, California back in 1996?

The one where Pacific Gas and Electric (PG&E) had to pay out $333 million because they were killing people with chromium 6 that they were leaking?

Well, that problem hasn't gone away.

A survey conducted by an Environmental Working Group showed that the drinking water in 31 out of 35 cities tested contained Chromium 6 in varying levels. The "safe" level set by the Office of Environmental health Hazard Assessment is 0.2ppb. For more, read the report posted on Environmental Working Group website.

The highest levels were found in Norman, OK, Honolulu, HI and Riverside, CA. Cincinnati and Boston weren't far behind. Hinckley, CA is actually having water shipped in because the Chromium 6 has leached through the clay barriers that were put in place by PG&E.

Chromium 6 causes cancer. Plain and simple. And it's in the water supply of many cities across the US.

Fluoride

In 1946, Grand Rapids Michigan became the first US city to add fluoride to its water supply in an attempt to prevent tooth decay among its citizens. By 2008, more than 72% of Americans live in areas that add fluoride to the water supply.

Though the government shows studies that prove that tooth decay has declined significantly in populations that drink fluoride-supplemented water, the same decline has been noted in other countries that do not add fluoride. This is possibly due to better oral care, not the addition of fluoride.

Fluoride accumulates in bones and some people suspect that it plays a role in bone disorders as well as other health conditions.

A review conducted by the National Academy of Science on the toxicity of fluoride concluded that it is an endocrine disruptor and may affect many different things in the body including the brain, bones, thyroid, pineal gland, and possibly even blood sugar levels.

According to those in the know, studies for links to dementia, ADHD, diabetes and other debilitating conditions need to be conducted. Read more about the effects of fluoride on Fluoride Action Network website.

Studies haven't been adequately conducted to either prove or disprove these possibilities so in the meantime, you may wish to avoid fluoridated water.

Arsenic

Symptoms of arsenic poisoning (Photo credit: Anita Ghosh/REACH)

Arsenic is a naturally-occurring mineral. It may cause cancer, birth defects, reproductive issues, and serious skin problems.

Oh, and it can kill you in high enough doses.

According to a study conducted by the National Resource Defense Council, more than 22 million Americans are exposed to water that has average levels of 5ppb arsenic.

In 2006, the EPA set a standard of 10ppb as safe but science has since shown that there are no safe levels of arsenic.

Lead

There is no safe level of lead in the water even though the EPA has set the standard at no more than 15ppb. Water sanitation facilities are required to test for lead regularly and if this level is exceeded, action must be taken to reduce the levels.

Lead, which was used in paint until a few decades ago and is still present in many pipes and household fixtures such as brass doorknobs, is linked to delayed development, reduced attention span, and learning disabilities in children. You can build toxic, lethal levels of lead with regular exposure.

Symptoms include:

- abdominal pain
- abdominal cramps
- aggressive behavior
- constipation
- sleep problems
- headaches
- irritability
- loss of developmental skills in children
- loss of appetite
- fatigue
- high blood pressure
- numbness or tingling in the extremities
- memory loss
- anemia
- kidney dysfunction

Bad Bacteria

(Such as E. Coli, Salmonella, Campylobacter jejuni, Vibrio Cholerae, and Staphylococcus Aureus)

We all have bacteria in our bodies but it's the good kind; the kind that helps to digest food and protect us from the bad kind. The bad kind of bacteria, including the ones listed above, wreak havoc on your body. E. Coli is found in human feces and is thus spread by contact with human feces, such as when water is contaminated with sewage.

Symptoms begin anywhere from a few hours to a few days after exposure and include diarrhea, stomach cramps, nausea, vomiting, and fever. You may know this by the term “food poisoning” and if others are exposed to contaminated bodily fluids, it can be spread.

Campylobacter and salmonella are contracted from eating raw or undercooked poultry. Sometimes they’re associated with unpasteurized dairy products and produce, probably because of exposure to contaminated poultry.

Water is contaminated by it either from exposure to these components (people dumping food in the water) or by farm runoff because chickens often carry the bacteria with no symptoms. Symptoms are the same as for E. Coli.

Staphylococcus aureus is a different beast. It’s ugly and can kill you. It affects your skin, blood, heart, and lungs and causes weeping, pus-filled abcesses. You can get the infection from contact with the bacteria to broken skin or you can get it from ingesting food or water tainted with it. Needless to say, it’s infectious but it can be treated with antibiotics.

Filtration with a filter .03 microns or smaller along with disinfection with chlorine, iodine, or chlorine dioxide effectively kills bacteria.

Viruses

(Such as Hepatitis A, Rotavirus, Enterovirus, and Norovirus)

Hepatitis A is caused by ingesting food or water contaminated with feces. It’s also associated with undercooked shellfish.

It affects the liver and symptoms include jaundice, nausea, vomiting, fever, diarrhea and abdominal pain and cramps.

Symptoms of Hepatitis A usually manifest 2–6 weeks after exposure and, though there is no treatment for it, it generally goes away on its own in about 8 weeks. Some people experience recurrence of the symptoms several months after the initial episode. It’s contagious.

Rotavirus is extremely common and is the most common cause of severe diarrhea in infants and small children. With each exposure, an immunity is built so it’s not as common in adults. Though it typically isn’t dangerous, nearly half a million kids, mostly in underdeveloped countries, die from it each year. Kids in the US are usually vaccinated for it. It can also infect livestock.

Non-Polio Enterovirus symptoms are usually similar to those of a cold: runny nose, fever, rash, mouth blisters, and body aches. Some strains can cause hand, foot and mouth disease, viral meningitis and viral conjunctivitis (aka pink eye). In less common instances, it can cause infection in the brain, heart or the sack around the heart, or paralysis.

Enterovirus is spread by physical contact, touching contaminated surfaces and in water. Disinfectants such as chlorine, chlorine dioxide or iodine are effective against viruses.

Parasitic Protozoa

(Such as Cryptosporidium and Giardia Lamblia, Amoebae, Ciliates, and Flagellates)

Protozoa can survive for weeks or even months in cold water without a host.

Both giardia (aka beaver fever) and crypto are in a protective shell called a cyst which makes it resistant to disinfectants including iodine and chlorine.

Just a couple of tiny cysts can cause infection and once it hits your stomach, the acid eats through the cyst, releases the beast and the fun begins.

Infections from both cause watery diarrhea, stomach upset, vomiting, gas, and intestinal distress. Infection lasts from 1–6 weeks typically but in people with weak immune systems, it can last up to a year.

Boiling at a rolling boil for at least 1 minute kills it and filtering can help, too, if you use 1 micron or smaller filter.

Parasitic Worms

(Such as Flatworms, Flukes, and Roundworms)

Ok, this one is just gross to think about. They are actually worms that live and thrive in our bodies and are found in water. They're spread from fecal matter that gets into water. You can get them from your pets, too.

There are many types of worms including tapeworms, pinworms, hookworms, threadworms, and heartworms and they can kill you if you don't get rid of them; especially heartworms and tapeworms.

Flukes are confined to hot tropical areas such as North Africa and Southeast Asia but the rest of them are found pretty much everywhere.

Symptoms vary and include abdominal swelling, skin conditions, restlessness, anxiety (they affect your central nervous system), lethargy, constipation, diarrhea, gas, joint and muscle aches, and even food allergies because they affect your digestive tract.

In addition to being found in water, they're also airborne in some instances, are transmitted via insects such as fleas and mosquitoes. They can be found in undercooked foods, on fruits and veggies and in the ground or in areas where fecal matter is or has been present.

The only way to get rid of worms is by using a medicine called an anthelmintic. Tapeworms are tougher to get rid of and don't respond to some of the standard anthelmintic. Natural remedies include clove, black walnut, and wormwood though the efficacy of these aren't tested.

Treatment of water with chlorine, iodine or chlorine dioxide effectively kills most worms.

Chemicals and Pharmaceuticals

These sneak into your water because of pollution from farms, industrial communities, and urban living. People dump unused drugs down the toilet and they're also in urine and feces and make it into the water supply that way.

Unfortunately, many water treatment plants are antiquated and not equipped to deal with the removal of these contaminants.

Many can be removed by distillation or reverse osmosis, though there are some chemicals that evaporate at a lower temperature than water so they pass through the still when you're distilling the water. Reverse osmosis is the best way to filter these out.

As you can see, there are many pathogens and contaminants that can be present in water that can make you extremely ill.

Regarding the safety of the water at your house, reverse osmosis systems that fit under the sink are great options and don't cost too much. They're also fairly easy to install so if you're a bit handy, you're good to go.

But check out the chapter about how to purify and re-mineralize water to find out more about the options that you have when buying a water filter.

6 WAYS NATURE CONTAMINATES YOUR WATER

The common misconception about contaminated water is that the contamination comes from people. While pollution is certainly a major contributor, there are several natural sources of water contamination, too.

That means that even water that hasn't been exposed to people may potentially be unsafe. Here are the most common types of natural contaminants found in water.

Toxic Plants

Some plants and algae can contaminate water supplies and cause a host of illnesses.

For instance, Cyanobacteria, or blue-green algae, is found in lakes, rivers, ponds, and other bodies of water.

It can produce toxins that can cause rashes if you touch it and cramps, vomiting, sore throat, diarrhea, fever, headache, muscle, and joint pain and even nerve or liver damage if you drink it.

Red and brown algae also cause health problems in humans. Though these toxic plants are caused by humans, they now exist in their natural forms in our water supplies and found in areas with increased levels of nitrogen and phosphorus.

These algae can kill sea birds, fish, and marine mammals and can be harmful to humans as well.

They also pose a secondary problem; since they kill off fish and other aquatic creatures, their presence creates a dead zone where nothing can live. Though the plants eventually die off, if there are no fish to repopulate the water then the water remains a dead zone.

Dead Animals

When a large animal dies in or very near a water source, the decay process can cause an increase in nitrogen and phosphorus that can trigger other events harmful to humans such as growth of toxic plants.

Also, many animals carry diseases or bacteria such as bird flu, rabies, and salmonella that can be transmitted via water.

Animal Feces

We've all heard of the bubonic plague, rabies, West Nile encephalitis, Giardia, and Legionnaire's disease. Did you know, though, that you can catch them through contaminated water?

Well, you can. If the animal is infected and voids in the water, that water is now contaminated with the disease. E. Coli, cryptosporidium, listeriosis, and salmonella can also be spread through the water.

Though the odds of catching most of these diseases from water is slight, it does exist and would be a major source of widespread disaster, especially in the cases of plague or rabies, should even one person catch it in a post-disaster situation where medical facilities are limited or non-existent.

Ammonia found in urine and feces is also an issue; it can cause an increase in algae bloom that can cause fish to die and create dead zones. Ammonia can be carried through the air for more than 300 miles before being deposited into water supplies.

Minerals

As water courses over rocks and through the Earth, it picks up different types of minerals.

While many of these, such as calcium, magnesium, iron, and copper aren't bad for you in the amounts typically found in water, others can be.

Of particular concern is arsenic, mercury, cadmium, lead, and fluoride. These can be harmful in even small doses, especially if you're drinking that water on a regular basis. We have already covered their effects in the previous chapter of this report.

Turbidity

Turbidity refers to the clarity of water. This is important because many viruses, parasites, and bacteria are killed by the UV rays in water. If, however, the water is cloudy, the sun can't get through the water to kill these hazards.

High turbidity levels are often associated with high levels of microorganisms that can cause disease.

Turbidity can be naturally caused by storms and other disturbances that keep the water stirred up.

Don't drink water that isn't clear unless you're using some form of water purification such as tablets, liquid, or boiling because it's not safe to drink just by using UV light.

Natural Disasters

Common natural occurrences such as landslides and volcanic eruptions can cause serious issues in water quality in a number of ways.

Landslides kill animals and the decomposing bodies can cause the issues discussed above. They also cause turbidity and can dump a large amount of minerals into the water at once.

Volcanoes cause pollution in a couple of different ways. First, the ash causes high turbidity, which can temporarily increase the growth of bacteria and other contaminants in the water. It can also temporarily lower the pH of the water, making it more acidic.

Though a small eruption probably won't have an effect on the water quality for more than a few days, a large eruption such as the one that

could occur if the supervolcano in the Midwest should erupt could have catastrophic consequences on the water supply.

Forest fires can cause the same type of disruption in water quality as both landslides and volcanoes, though you don't typically see an increase in the acidity.

Burning vegetation releases chemicals and minerals in plants such as nitrates, ammonia, and phosphates. At high levels, this can be toxic to fish and other aquatic animals. Nitrate is especially concerning because it's carried downstream and into the water supply.

Other concerns associated with forest fires are increased turbidity and the introduction of heavy metals and radionuclides from the ash and soils from the local geography. Diseases and bacteria from dead animals get in the water, too. You also have to remember that firefighters go in and spray with chemical fire retardants, so that ends up in the water as well.

As you can see, water contamination doesn't just come from people. Even the "cleanest" water can still be contaminated by that dead deer just up the stream or from the landslide that took place right around the bend. Don't ever assume that water is safe to drink just because you're away from humanity and it looks clean.

Streams in higher elevations that aren't close to people are a safer bet but there's no guarantee that there's not a dead deer lying upstream

or that infected animal feces isn't in the water. It's always better to be safe than sick so treat every source of water as if it's tainted when you're in the wilderness.

Always take a means of purifying your water before you drink it because even though diseases and illnesses are rare, you'll really be second-guessing your decision if you are unlucky enough to get sick.

Fortunately, there are several different ways that you can avoid most of these conditions. Carry your own water or pack some water purification tabs.

There are water bottles that purify water as well as straws that allow you to drink straight from the stream. If push comes to shove, boil the water before you drink it. It's just not worth getting sick over.

TOP WATERBORNE INFECTIONS AND HOW TO PREVENT THEM

Infections are common illnesses in crisis situations, because stress affects the ability to fight off infections and people become infection-prone.

When you're hungry you don't exactly have access to fresh foods, proper refrigeration, or sanitary cooking conditions. You can even eat a mouse if you're hungry. You just cook it and eat it. There are going to be problems with infectious diseases, first and foremost food-related, then water-related.

The water situation in a crisis or disaster tends to be dire. You cannot trust that the water treatment plant is working so even if there is running water, it cannot be trusted.

The disaster will likely disrupt the normal water supply, leaving the water exposed to pathogens from a disruption in the water treatment plant or a disruption in any one of the pipes that lead to the family water supply. There may be no water so that the family must get water from other sources, or process it in order to kill the germs and make the water drinkable.

Top Waterborne Infections & Their Treatment

Pathogens can get into the water quite easily and can get into the water even when proper cleansing techniques have been employed.

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1. Giardia

Giardia is an intestinal parasite found in water, soil, or surfaces that have been infected with human feces.

The parasite causes a diarrheal illness in humans called Giardiasis. It can also infect dogs, cats, cattle, and wild animals like beavers and deer. It is killed by chlorinating the water.

Giardiasis is the most common intestinal parasitic infection affecting people. It affects up to 2 percent of adults and 8 percent of children in developed countries like the US. In developing countries with poor sources of water, the disease affects up to 33 percent of the population.

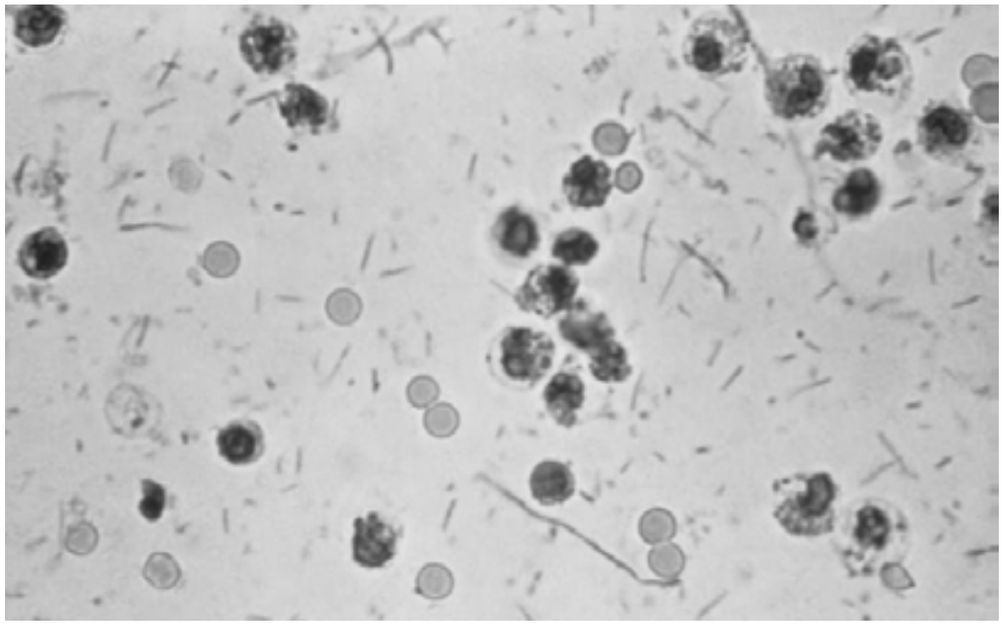
The infection is caused by the swallowing of hard Giardia cysts containing the parasite. An infected individual can shed up to ten billion cysts every day in their feces.

Even when clinically well, the individual can shed cysts for several months in their feces. This means that washing or using antiseptic wipes to clean the hands after having a bowel movement is crucial in a disaster situation and water must be boiled and cooled before eating or preparing food.

The treatment of Giardia involves staying hydrated and treating with Flagyl 500 mg twice daily for ten days.

This can quickly become an epidemic in a disaster situation if strict hand washing technique isn't followed.

2. Shigella



Shigella is a bacterium that is shed in stool and can be gotten from contaminated water or food that contains the Shigella bacterium.

Symptoms include fever, cramps, and diarrhea with the potential for bloody diarrhea.

The condition resolves in about 5–7 days and is responsive to antibiotics. Children can get a high fever and seizures if they come down with the illness. The diagnosis of shigellosis comes from stool samples that are positive for the bacterium.

If the infection is detected early enough, antibiotics can be provided in order to shorten the course of the disease. Antibiotics can also help prevent the spread of the disease due to contact with those who have the infection and have poor hand washing techniques.

Most people recover from Shigella infections without adverse effects, however around 2 percent of people who are infected with Shigella flexneri — a strain of the bacterium — will develop joint pain, pain on urination, and eye irritation, and this can last for years or become chronic.

Treatment includes staying hydrated, treating high fever, and taking antibiotics such as Cipro 500 mg twice daily for ten days.

3. Amebiasis

This is a parasitic infection caused by the protozoan Entamoeba histolytica.

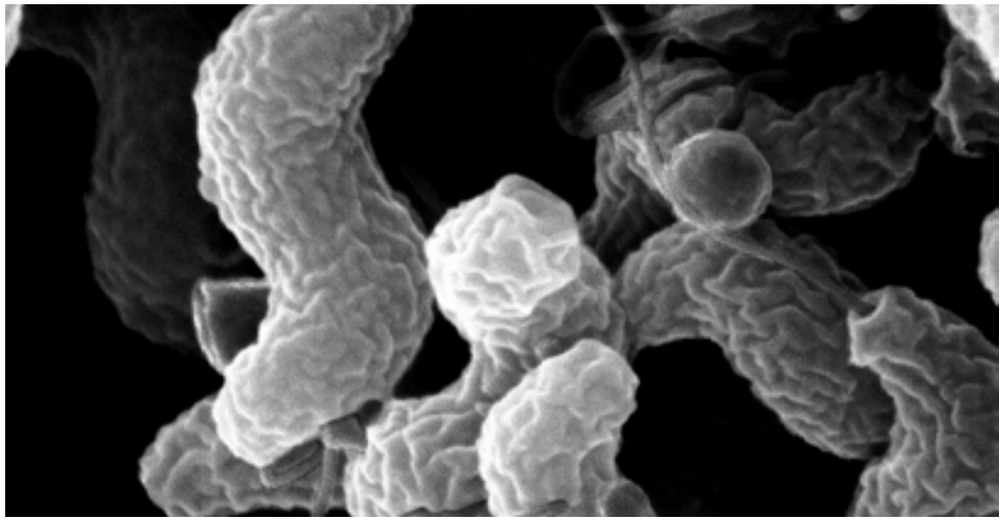
Common symptoms include diarrhea, fatigue, abdominal pain, weight loss, and flatulence. There is blood in the stool and invasion of the intestinal lining with passage of the amoeba into the bloodstream, where it can cause liver abscesses.

About 90 percent of those infected have no symptoms but can be passed on to someone else. Throughout the world, it causes approximately 70,000 deaths per year. In some cases, there is amoebic dysentery and amoebic colitis, which are more severe.

Good sanitation can prevent epidemics. Treatment involves taking Flagyl 500 mg twice daily for ten days followed by paromomycin for ten days.

Like most of these diarrheal illnesses, no antidiarrheal is recommended as they can make the symptoms worse.

4. Campylobacter



This is a bacterium that can be carried in tainted food and water and can cause abdominal cramps, diarrhea, and sometimes nausea and vomiting.

Boiling water and then cooling it can help prevent an infection from Campylobacter. The disease caused by this bacterium is called Campylobacteriosis.

The treatment of Campylobacter is controversial. Some studies indicate that treating with erythromycin clears Campylobacter quickly from the bowels but doesn't change the course of the disease. Others state that erythromycin should be reserved for severe cases of the disease.

5. Viral Gastroenteritis

There will be several kinds of bacteria that cause viral gastroenteritis. These will cause watery diarrhea and generally do not cause bloody diarrhea. There can be nausea, vomiting, and abdominal cramps. The symptoms are completely self-limited and last about a week.

Treatment is rehydration with as many fluids as you can safely drink.

There are many other bacteria, viruses, and protozoa that are carried in water contaminated by human or animal feces. Most are preventable by boiling the water before drinking. Many resolve spontaneously without treatment.

Even so, the diarrhea and other symptoms are very difficult to manage when you are already in a crisis situation.

Hand washing is of paramount importance in preventing waterborne infections along with the boiling of all water consumed by the family.

Your Hygiene Guide for Preventing Illnesses

Living life off the grid comes with all kinds of challenges, some you may be ready for and others that never occurred to you until they arise.

For many, hygiene falls into the latter category. Having easy access to soaps, shampoos, toothpaste, and other modern hygiene conveniences is something that most of us take for granted.

While hygiene may seem like a delicate subject, or one to giggle about, it is serious business. If you are living off the grid keeping yourself

and your family clean is a matter of health. Without good hygiene, you can easily pass illnesses around and put yourselves at risk of contracting serious diseases.

There are ways, though, that you can maintain good hygiene and good health whether you are off the grid, prepping, or getting into prepping mode.

Plan Your Stockpiles

Every prepper and off the grid homesteader knows the importance of good planning and preparation. Before disaster strikes, be sure you have included hygiene on your prepping list. Start your planning for hygiene and health care with the stocking of supplies.

Make a list of what you use to maintain good hygiene and start collecting. This may include soap, shampoo, deodorant, hand sanitizer, wet wipes, tampons, and any number of other supplies you use on a regular basis and find you can't live without.

If you need to scale back because your storage space is limited, leave out those items that are not necessary for health and safety. For instance, you can live with a dual soap/shampoo and without conditioner and deodorant. Do not leave out things like soap, sanitizer, and first aid supplies, however.

Ensure Clean Water

Having a steady supply of clean water is perhaps the most important aspect of off the grid living, and an essential factor in maintaining good hygiene.

Before you finalize any plans for going off grid, be sure you have water sorted, and plan for more than one source.

Start by having a plan to store clean water for immediate needs during a crisis. This could mean stocking up on bottled water and collecting water in your bathtub.

For the long-term, a well is ideal. If you are making a move, find a location in which you can dig a well for your own personal use. Living near a stream is a good back up, but a well is better. Even if you have a well or other water supply, use rain barrels too. The more water you have, the better you will be able to keep things clean. If you have to be stingy with your water supply because you don't have enough, hygiene, and as a result your health, will suffer.

The Bathroom

Doing your business off the grid can be messy and dangerous. If you have working plumbing and your own septic system, lucky you! If not, you have a few options. The key to going number two without indoor plumbing is to keep it sanitary.

If you dig a pit toilet, keep sawdust on hand so that everyone can cover up after their turn at the pit.

Lime can also be sprinkled in the pit to keep it sanitary. If you have toilets, but no running water, you can still use them as long as your water supply is plentiful. Just dump enough water in the bowl to flush the waste down.

As for toilet paper, you can stock up ahead of time, but eventually you may run out. Any kind of paper will work, but so will leaves, just be sure to avoid poison ivy. Or you can try to DIY, in your homestead.

Make sure everyone in the household understands the importance of hand washing after every single bathroom use. If you have no running water, sanitary wipes or alcohol-based sanitizer are good alternatives.

Getting Clean

As long as you have enough water, keeping clean will be possible for you.

It may not be as easy as taking a shower or running the dishwasher, but it will be doable. If you have a pond or river nearby, you can bathe there with natural, biodegradable soaps.

If not, you can use a camp shower to get clean. Also known as solar showers, you simply fill the bladder with water, hang it from a tree branch and let the sun warm it. Open the nozzle and you have a warm, outdoor shower.

Cleaning dishes and eating utensils is serious business when you're living off grid. Dishwashers are great at sanitizing and we take that for granted. When washing your dishes, heat up water, use soap, and rinse in a light bleach solution if possible. The latter is particularly important if you are living with a large group of people.

Miscellaneous

There are many other things to consider when maintaining good hygiene off the grid.

For instance, don't get lazy about your teeth. Getting dental care may not be possible, so prevent any problems by brushing and flossing every day. If you run out of toothpaste, use baking soda, or even salt to scrub and then rinse. Long before toothpaste, people chewed sticks and it works.

Use something fragrant to freshen your breath and clean out bits of food at the same time.

For menstrual cycles, stock up on tampons and sanitary napkins. These will not last forever, though, so for a long-term solution, look into reusable rubber cups. These can be inserted to catch the blood and used again and again for years. Wash thoroughly after each use and when not needed, store it in a dry, sealed container to keep it clean. Keep a small supply on hand, just in case.

Finally, as you plan and prepare for a disaster or for going off grid, stock up on wet wipes, both anti-bacterial and regular. These are invaluable items when it comes to convenient hygiene. If you have the storage space, keep plenty on hand for hand washing, face washing, a refresher between bathing, and for disinfecting.

With good planning and preparation, and an eye for hygiene, you can maintain a sense of cleanliness and good health even when disaster strikes.