

JOURNAL OF

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VOLUME 52

2019 Issue 1

TACDA *Announces*
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Notes

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				A V P U
				A V P U
				A V P U

Not Breathing DEAD

Not likely to survive EXPECTANT

Likely to survive given current resources IMMEDIATE

Obeys commands or makes purposeful movements AND Has peripheral pulse AND Not in respiratory distress AND Major hemorrhage controlled DELAYED

Minor injuries only MINIMAL

MT-137 BACK

0 1 2 3

Not Breathing DEAD

Not likely to survive EXPECTANT

Likely to survive given current resources IMMEDIATE

Obeys commands or makes purposeful movements AND Has peripheral pulse AND Not in respiratory distress AND Major hemorrhage controlled DELAYED

Minor injuries only MINIMAL

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 The American Civil Defense Association has made some exciting changes to better serve our members.

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The American Civil Defense Association is on Facebook!
 Take the time to LIKE us and receive more valuable links and updates!

PRESIDENT'S MESSAGE



There are many exciting changes happening at The American Civil Defense Association.

First, we are delighted to announce that all memberships will now be *free for life!* All you have to do is sign up. If you already have a membership, you don't need to do anything. Your membership will automatically be converted to a free life-long membership.

Second, optional hard-copy subscriptions to the *Journal of Civil Defense* will now be offered at a much lower cost of \$12.00 a year and will be mailed to our members in April and October. Every member will receive an *e-Journal of Civil Defense* at no charge. An electronic copy will be emailed twice a year also in April and October to all members regardless of a paid subscription.

Third, we have recently launched our new website <https://tacda.org/> that has many improvements. We have changed the access requirements for the *Journal of Civil Defense* archives that will allow all members unlimited access to the *Journal of Civil Defense* dating back to our very first journal in 1968.

Please let us know if you have any suggestions for improving our services and access to the site. We need your guidance and participation to make the organization better as we execute these changes.

Please be patient as we make these changes. We are a rather small organization with relatively modest resources in time and money to make these improvements.

We would appreciate any donations that you can provide to the organization in order to help us with our mission of helping individuals prepare themselves for potential threats in the future. You can also help by informing others about our organization to help them take advantage of the information available in the current publications and archives.

We definitely appreciate your support and look forward to serving you and serving with you in the cause of helping everyone in their preparedness efforts.



Jay Whimpey, PE
TACDA President

FROM THE EDITOR

We are absolutely thrilled with the direction that TACDA is going. The *Journal of Civil Defense* is a valuable resource for anyone who is interested in preparing for the challenges in our future. That resource will now be available to a much wider audience. The new TACDA Manager, Roseanne Hassett, has been feverishly working to implement all of these exciting changes and is doing a great job.

I would like to thank our contributing authors for donating their valuable time and professional talents to create outstanding content. We would not be able to produce the *Journal* without you. Please accept our sincere appreciation for all that you do.

We will now be able to produce the *Journal* on a reliable schedule. You should expect one in your inbox every April and October. Please let us know if you have any topics that you would like to see us cover in the *Journal*.

Finally, special thanks to Jonathan Jones and Roseanne Hassett for the many hours spent proofreading content. And to our graphic designer, Lisa Potter for making the *Journal* look incredible. We appreciate each of our loyal members for supporting TACDA through the rough times.

I am pleased to present to you the Spring 2019 issue of the *Journal of Civil Defense*. I hope that you find something in this issue that will help you as you prepare for an uncertain future and motivate you to keep prepping.



Kylene Jones
Editor, *Journal of Civil Defense*

HAND INFECTIONS

How to Prevent Loss of Life or Limb

by Cynthia J. Koelker, MD



Hand infections are among the most common – and the most serious – skin and soft tissue infections you’ll encounter in a world without modern medicine. They can strike any person of any age, whether in good health or bad.

Consider the following realistic scenarios:

Case #1

Your 6-year-old daughter is delighted with the fluffy kitten you’ve given her as a birthday gift. But the next morning she has painful pink streaks running from her hand up past her elbow. Might your kind gift lead to her untimely death?

Case #2

Your teenage son has assumed the task of chopping wood, though you wish he’d be more careful. His hands are always covered with scratches. When he can stand it no more, he shows you the red, swollen area from a deeply embedded splinter. Could his helping out cause his ultimate demise?

Case #3

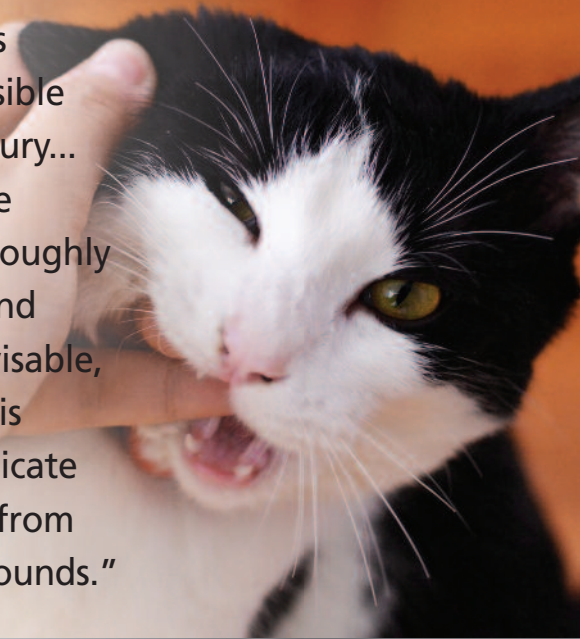
Your hot-headed brother meant well when he bashed an intruder in the face, knocking out the culprit’s front tooth in the process. But three days later his hand is so swollen and tender he can barely move his fingers. Should you be worried his bare-knuckled approach might lead to loss of life or limb?

The answer to all three questions is a resounding yes!

Any emergency room physician will concur, and has no doubt admitted patients such as these with potentially life-threatening infections.

As a whole, these three scenarios lie in the realm of preventable serious hand infections. All are representative of real-life situations already common in today’s era of advanced medical therapeutics, and will no doubt remain commonplace regardless of future events. What may change is the ready availability of appropriate antibiotics as well as doctors, including surgeons, to intervene. Each case will be discussed in detail below to allow appropriate treatment much of the time, perhaps in 75 to 90% of patients, if one is prepared ahead of time.

"Due to the high risk of serious infection, cat bites need to be treated ... as soon as possible after the injury... Cleaning the wound thoroughly with soap and water is advisable, although this cannot eradicate all bacteria from puncture wounds."



Case #1 falls into the category of animal bites, with cat and dog bites being by far the most common. The greatest risk factor for an animal bite is having a pet. Although, of course, rabies can be a significant concern, the bigger problem is bacterial contamination of a puncture wound. And although cat bites are generally smaller than dog bites, the sharper feline teeth can push bacteria deep into a wound, which cannot be easily cleansed with soap and water, and which often is perceived as a quite minor injury. However, within hours of the bite, infection can spread from the hand to the arm and beyond. Without antibiotic treatment, infection can continue up the lymphatic or venous systems, through the bloodstream, causing sepsis, eventual shock, organ damage, and even death. Though I have never witnessed a patient die from a cat bite, I have seen some who I believe were headed in that direction. In my own practice, I have seen a dozen infected cat bites for each infected dog bite.

Cat bites also tend to be on the hand, where infection can spread rapidly, and where localized infection can easily cause significant loss of function. Even the short but needle-like teeth of cats can penetrate to the underlying tendons on the back of the hands, which are

unprotected by layers of fat or muscle. Statistics on cat bites are grim: according to a 2004 study at the Mayo Clinic, 30% of patients with cat bites who present to the emergency room required hospitalization, and 2/3 of these patients required surgical intervention.

Due to the high risk of serious infection, cat bites need to be treated either prophylactically as soon as possible after the injury, or at least as soon as any sign of infection is evident. Cleaning the wound thoroughly with soap and water is advisable, although this cannot eradicate all bacteria from puncture wounds. Prophylactic antibiotics should be continued for at least 48 to 72 hours after injury, whereas treatment for established infection will require on the order of 1–2 weeks, depending on severity. Once infection takes hold in deeper tissues, oral antibiotics may not be sufficient to clear the infection, and damage to deep tissues may occur, so this is one case where early use of antibiotics is mandatory.

Because cat bites may introduce Staphylococcal or Streptococcal bacteria, as well as anaerobes and Pasteurella species, strong antibiotics or antibiotic combinations must be used. These are often given intravenously for hospitalized patients, but only oral therapy will be addressed here. By far the preferred initial choice is amoxicillin-clavulanate (Augmentin), at 875 mg twice daily, or 500 mg three times daily. Other options in order of efficacy include the following.

- Amoxicillin-clavulanate alone (preferred)
- Two drug combinations: Either cefuroxime, ciprofloxacin, levofloxacin, or trimethoprim-sulfamethoxazole *plus* either clindamycin or metronidazole
- Either azithromycin or doxycycline PLUS either clindamycin or metronidazole (but less effective than above)

Although dog bites can certainly be larger than cat bites, they also tend to leave larger entry wounds, allowing better access for cleaning. Animal bites should *not* be sutured (except perhaps on the face for cosmetic reasons). Wound closure only traps the germs and allows them to proliferate. Antibiotic treatment is similar for

dog bite wounds of the hand, since all bites to the hand are considered serious. For dog bites elsewhere on the torso, arms, or legs, watchful observation may be appropriate after initial thorough cleaning, reserving antibiotic use for if signs of infection occur (redness, swelling, pain, fever or local warmth).

Bite wounds from other animals are encountered much less commonly, and their treatment is beyond the scope of this article.

Case #2 is an example of a typical traumatic wound infection, in this situation including a foreign body (splinter) and possibly a collection of pus. As a general rule, you can never clear infection as long as a foreign body remains in the body, especially a wooden splinter. Similarly, unless a pus collection is smaller than a pimple, it must be drained to allow infection to clear, and the sooner the better. Whereas damaged skin can heal with fairly minimal scarring, once tendons or joints are infected they can suffer permanent functional damage. If you open your hand flat and bend your fingers backward, you can easily see how close the underlying tendons are to the skin surface. Oral antibiotics are appropriate for skin and superficial soft tissue infections, but much less reliable for healing infection of deeper tissues such as tendons, joints, or bones.

Soft tissue infections are typically caused by Staph and Strep bacteria. When these bacteria spread beyond the soft tissues and get into the blood stream, sepsis can occur and lead to death. One particularly gruesome consequence of Staphylococci entering the blood is infection of the heart valves, which can be destroyed, leading to heart failure and sometimes death. I have seen one patient, a good friend, die from this despite the best current medical care.

Regarding treatment, when there is an abscess-like infection, or pocket of pus, but little to no surrounding redness, simply draining the infection may be sufficient to clear the infection. Using a scalpel or other razor-sharp edge, an incision must be made overlying the abscess (hopefully using local anesthesia), and should generally extend at least half the diameter of the abscess to allow adequate drainage. Once the pus has been drained, the wound should be flushed thoroughly with large amounts of sterile saline, sterile water, or even clean tap water. Afterward it is best to insert a small drain into the wound to prevent the edges from healing together too soon, which can lead to repeat abscess formation. The wound edges should *not* be sutured back

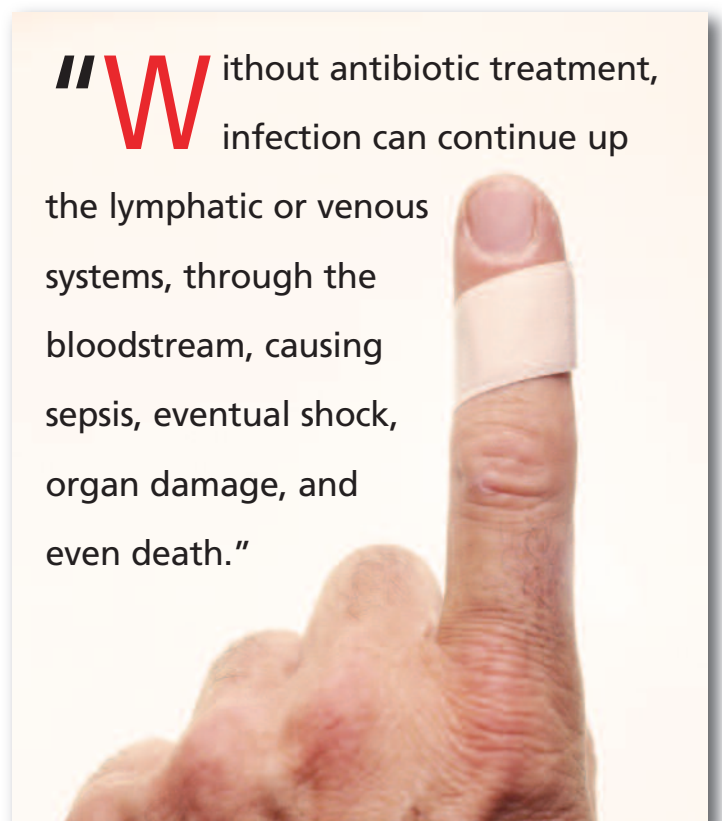
together. A drain can be made of a small piece of sterile gauze or rubbery (or plastic) material. Taping the tail of the drain in place onto adjacent skin increases the likelihood that it will stay in place the required 2–3 days.

If an infection has caused redness of the surrounding tissues, or if only redness is present with no pus pocket formation, then this should be treated as cellulitis. An abscess is much like a water balloon, which can be popped, releasing its infected contents (pus). However, cellulitis is more like infection or fluid within a sponge, which cannot simply drain out through an incision. Therefore, other healing techniques are required.

Any bacterial infection is really a race between the bugs, the drugs, and your own immunity. Antibiotics help to kill the bacteria until your own immunity can eliminate all final traces of infection. Adequate circulation is another vital factor in clearing infection, and this you have some control over. A missionary physician once told me she had treated cellulitis on many occasions using heat alone (warm soaks or compresses), which increases local circulation. Applying heat for 20 minutes several times a day, even hourly, may help significantly.

However, the currently accepted and likely more effective treatment of cellulitis is antibiotic therapy to cover invading Staph and Strep bacteria. How does a

Without antibiotic treatment, infection can continue up the lymphatic or venous systems, through the bloodstream, causing sepsis, eventual shock, organ damage, and even death.”



doctor know which to treat? You can't really know which germ is present without doing a culture, so doctors usually have to choose an antibiotic without knowing exactly what they are treating. Thus, antibiotics are chosen that are known to kill both Staph and Strep bacteria, at least most of the time. An additional wrinkle is the recent emergence of methicillin-resistant Staph aureus infections (MRSA), which are often immune to standard treatment. This has led to the practice of sometimes using two antibiotics simultaneously to treat skin infections.

As in Case #1, amoxicillin-clavulanate is among the best choices for infected wounds such as this, although it may not treat MRSA. Cephalexin is also an excellent choice, but again does not treat MRSA. For penicillin-allergic patients, azithromycin or doxycycline may be adequate antibiotic therapy. If somehow you know MRSA is common in your community, such infections may be treated with a combination of cephalexin plus trimethoprim-sulfamethoxazole or doxycycline, or either of the latter two alone. The exact ratio of "normal" infections versus "MRSA" infections varies per community, but is probably at least 4:1 in most areas, so amoxicillin-clavulanate or cephalexin are usually effective.

For preventing infection 2–4 days of antibiotics is generally adequate. Treatment of established infection can require 7–14 days, and sometimes longer.

Case #3 is categorized as a human bite, although the above incident actually occurred as a clenched fist blow to the teeth. However, medically speaking, it is

treated the same, since mouth bacteria enter the wound either way. Human saliva contains as many as 50 types of bacteria, with easily a million bacteria per drop.

Although such hand injuries may appear minor, studies have shown that over half the time a clenched fist injury may introduce bacteria into the knuckle joint itself, or overlying tendons, which is very bad news. One reason infection is so likely is that once the fist is unclenched, the sliding movement of the underlying tendons and connective tissue actually draws bacteria deeper into the wound where it cannot be cleansed with simple washing. Should you be on the scene of a fisticuffs encounter, it would be wise to intervene immediately if possible, in order to clean the wound before the injured fist is unclenched. Whenever the patient is first seen, the wound should be thoroughly cleansed, perhaps both with the hand flattened, as well as in the fist-ed position, though it may well be too late to eliminate all bacteria.

Hand injuries such as this are always considered serious, and should be treated with prophylactic antibiotics immediately, and continuing for 3–5 days, depending on severity of the wound. This is *not* the time to conserve your antibiotic supply, since once an infection is established, it could require weeks to even months of daily antibiotic therapy, which still might not be effective. For simple skin infections from a human bite, antibiotics should be given for 10–14 days.

For deeper injuries, such as a knuckle joint infection, 4 weeks of daily antibiotics is required, or 6 weeks if infection has penetrated the bone, which is difficult to ascertain

without radiologic imaging.

As with the first two cases, amoxicillin-clavulanate 875 mg twice daily is the best choice for initial preventative or actual treatment. For penicillin allergic patients, clindamycin may be used (600 mg first dose, then 300 mg three times daily), PLUS ciprofloxacin 500 mg twice daily.

I am repeatedly impressed with how careless people can be when it comes to injuries prone to infection. Part of this is simply ignorance, partly a sense of invincibility, but also largely the belief that doctors, hospitals, and appropriate medications are only moments away. Would you allow your son to chop wood bare-handed if you knew it could lead to death? Would you punch someone in the mouth if you thought you might lose your hand? Likely not!

In summary, the most important lessons to be learned are:

- Avoid hand injuries at all costs
- Consider all bite wounds and other hand infections as serious and potentially life-threatening
- Cleanse all wounds thoroughly with soap and water
- Begin amoxicillin-clavulanate as soon as possible for bite injuries to the hand
- Seek professional care if at all possible

Cynthia J. Koelker, MD is the author of Armageddon Medicine, How to Be Your Own Doctor in 2012 and Beyond, available at www.ArmageddonMedicine.net, where you can learn more about treating infection as well as hundreds of other survival medicine topics.

Create Your Own Legacy of



By Jeremy Starke

Saving seeds is a skill that is as old as man cultivating the lands for survival. The Bible has many parables about seed saving and sowing all throughout it. You know that having your own supply packet of seeds is a good practice of preparedness. Are you really adequately prepared though?

Acquiring your own supply of survival seeds for your storage is a start. It is vital and beneficial to learn the skills of saving seeds for your long term survival. You will want to practice this skill each year in order to forge this as one of your tools for survival. Some serious practice will guarantee that you will know what to do if called upon. You might even get some prize-winning tomatoes out of it.

Basics of Seed Saving

Understanding the basics of these methods will help you to get a better grasp on the steps you need to take to save seeds. First, you have to be able to discern the difference in the types of seeds that you want to acquire and ultimately grow. You also want to know how to store them for long term survival.

Let's start with some basic information and walk you through the steps to get started with this practice:

Open-Pollinated vs Hybrid Seeds

You might have heard a number of different terms when people talk about seeds. This is an important topic that will help you distinguish what type of seeds you want to start in your collection. Get this wrong and your next batch of plants will flounder and most certainly not be viable.

Open-pollinated - Plants that start from an open-pollinated variety and either self-pollinate or are pollinated by another plant of the same variety, will produce seeds identical to their parental plants. Simply put, this is the type of seed that you want to acquire. These seeds are pure and untainted by science.

Heirloom - This term refers to seeds that have been passed down from generation to generation. Typically, these are at least 50 year old varieties, so they have stood the test of time. These types of seeds are all open-pollinated in nature, so they are safe to grow for seed saving.

Non-GMO - This refers to Non-Genetically Modified Organism. Some seed advertisers have adopted this terminology, but it generally means the same as open-pollinated. These are also pure seeds.

Hybrid - These types of seeds must be avoided altogether if you want to save seeds. Plants grown of this variety were cross-pollinated. Therefore, planting the offspring seeds will not produce the same as the parental plants. You may get plants that never flower or other unwanted results. Avoid them like the plague. The names on the seed packet may have an F1 or possibly some other hybrid terminology.

Vegetable Planting & Growing Techniques

We won't delve too deep into this topic, but certainly, check out our gardening site (GardenerThumb.com) and resources for more information about growing vegetables. It is still important to adapt a few of these important concepts correctly in order to be successful in saving seeds.

Always plant multiple seeds of the varieties you start. This is important due to the natural law of the "survival of the fittest". Make sure that you select the healthiest looking seedling of the bunch to plant in your garden. This will be helpful in producing strong offspring.

Maintaining an ideal growing environment throughout the lifespan of the plants is crucial. Here is the trick - don't be the over-protective father. It is ok to allow the plants to have some stress in the form of competing weeds, insect invasions, and other minor occurrences that plants have.

Try and keep different varieties separated from each other. This topic can in itself be a whole separate discussion. A simple solution is to at least keep any hybrid plants away from your open-pollinated plants. An even better solution is to not grow any hybrid plants. You want to keep the plants as pure as possible.

Seed Saving Tips

The end of the growing season is always a busy time of the year. This is where you collect the bounty of your harvest. Collecting the seeds that you store for the next year is of utmost importance.

Many plants will have different ways and methods of collecting seeds, so I encourage you to do a bit more research on the particular type of plant you'd like to save seeds from. Start with some vegetables & fruits that are easy to grow like lettuce or watermelon.

Here are some of the basic tips of seed saving:

Make sure that your plants have fully matured. Knowing the maturation dates will help you to figure out when the seeds are ready to collect. Check the plants for signs of seeds formation. Some plants may change color, or the fruiting part of the plant may bulge significantly. Other plants will flower and you'll start to see signs of decay. Ensure that you collect seeds from your best-performing plants. Remember, "survival of the fittest" is an important natural selection method. It is best to avoid saving seeds from plants that did not fruit well unless it is a survival situation.

Seed cleaning is the practice of drying your seeds and removing any plant matter from the seeds prior to storing them. This is important for long term storage of your seeds.

Continues on page 28

Building a HOME FALLOUT SHELTER

By Sharon Packer

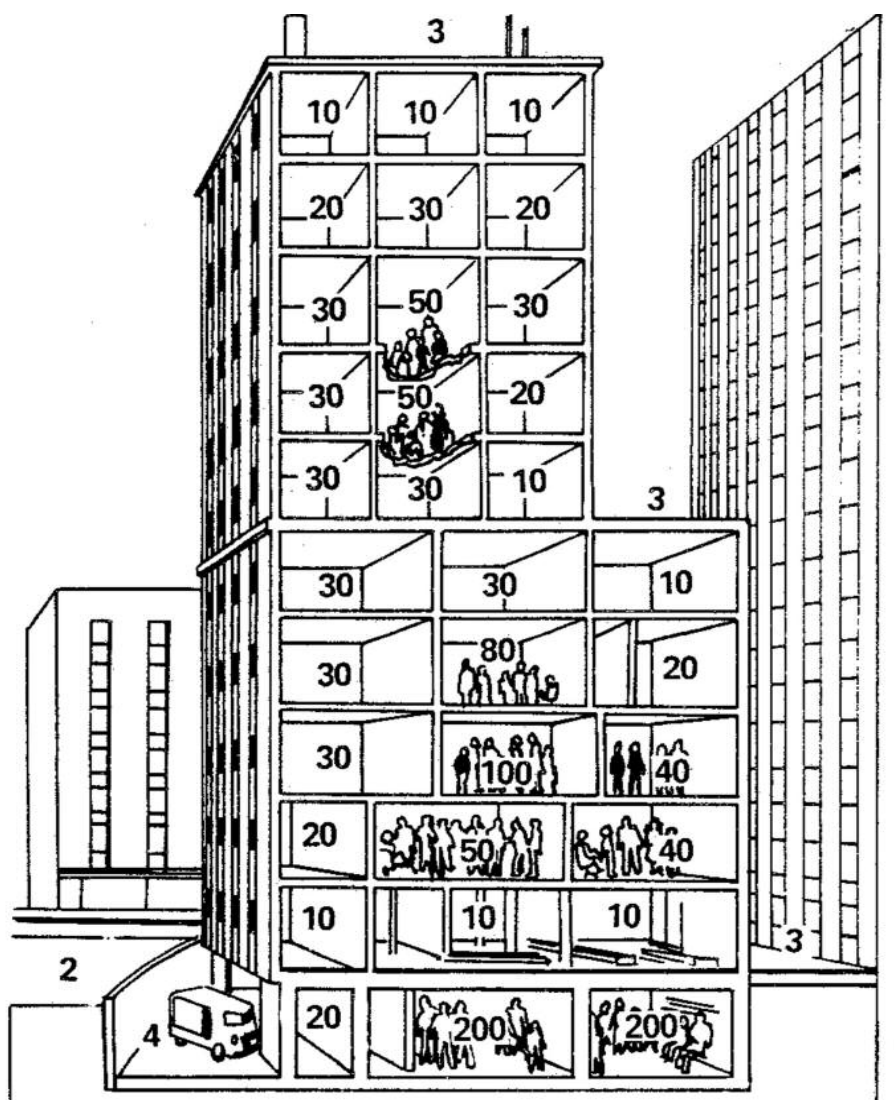
Our first choice, as civil defense advocates, would be for all Americans to have access to a hardened nuclear blast (NBC) shelter. One of the most well-known parts of the United States Constitution is its preamble, which in part, states that the purpose of the constitution is: “To Provide for the Common Defense--for ourselves and our Posterity”. This constitutional promise, unfortunately, does not appear to apply to the defense against a hostile exchange of nuclear weapons. Other than highly ‘important’ government officials, only a tiny percentage of our citizens have access to hardened shelters.

It is likely, that in a full-scale nuclear exchange, much of our population would be outside the range of the damaging blast effects. Most of us, however, could still have significant fallout levels, leaving radiation and EMP driven power outage as the greatest threat to our lives.

Throughout the years, much discussion from TACDA journals has been dedicated to measuring personal risk and identifying primary and secondary nuclear target areas. Basically, for a primary target, the question we must ask is: How close do we live to facilities such as military bases and airports with long runways, which would be considered a ‘retaliatory’ threat to the enemy? Secondary targets (such as dams, refineries and power plants), likewise, could be targeted with the same yield weapons, and blast damage could occur up to 12 miles from a detonation on these types of facilities.

Targeting, however, is not a perfect art, and if you live near a target, you could still be well within a range where a simple fallout shelter would save your life. In a large-scale nuclear exchange, lethal levels of radiation would affect most of the continental United States.





Relative levels of fallout protection in different parts of a typical building.

Fallout shelters are much less expensive and much more easily constructed than are blast shelters. Four inches of dirt, or 3 inches of concrete, will reduce radiation levels by 50 percent, resulting in a protection factor (PF) of 2. Each additional layer will multiply the PF by a factor of 2. We recommend at least 24 inches of concrete or 32 inches of dirt cover in a basement shelter, which will result in a PF of over 250. Your upper floor, if it survives the attack, will provide an additional PF of 5 in a one-story home resulting in a PF of 1250.

Home Shelters

Homes and apartments without a basement should look to interior rooms as the best location for fallout protection. Interior rooms of an apartment complex could give significant fallout protection (see drawing). Any addi-

tional shielding over and around your location will multiply these protection factors. Placing 12 inches of books, or other heavy items, on a sturdy table, with food and water supplies surrounding the table could provide a multiplication of that shielding by a factor of 8. Pull drinking water and prepared foods into the secured space and provide a bucket for sanitation. Gamma radiation decays quickly. Stay under the table for at least two days. After two days, the radiation levels should decay to one-one hundredth of the original levels. Plan and prepare these items well ahead of time, so that you can gather them quickly.

Basement Shelters

Typical home basement shelters, with one or two house levels above, must have about 24 inches of shielding overhead to obtain the proper fallout protection. The ceiling and walls will not have been engineered to carry such a heavy load. You must, therefore, build from the floor up, constructing a new shelter ceiling. Figure enough room between your new, finished shelter ceiling and your basement ceiling to easily stack 24 inches of heavy material inside the vacant area.

Shelter Placement

If possible, place the shelter in a corner of the basement so that two walls have outside levels of soil that reach above the level of the basement ceiling. If there is a window inside the chosen shelter area, the window should be removed, and the opening should be blocked. The window-well should then be filled with dirt.

Shelter Ceiling and Walls

Your engineer will design a suitable support system for the overhead shielding. The ceiling beams will need to be massive and placed on short centers. Your supporting walls will need a similar structure to support the heavy shielding and must be securely tied to the ceiling beams. Consult with your engineer on additional supporting

beams or walls on the interior of the shelter. Greater spans require greater support. He will also advise you on the placement of cross beams, torque issues and the ultimate thickness of your support walls.

Your engineer may choose to shield the ceiling of your shelter with solid 16" x 8" x 4" concrete blocks. If so, load them to a level of 24 inches deep. The blocks MUST be solid without interior holes. Do not leave spaces between the blocks. Place them close together and stagger the joints. The radiation shielding is provided by the mass of the material. These blocks will weigh about 33 pounds each and should be stacked six high for a total height of 24 inches.

Depending on the distance between the ceiling of the shelter and the ceiling of the basement, you may need to load your concrete blocks as each layer of plywood is laid on the ceiling beams. Finish stacking the shielding onto the area above each plywood layer before installing the next plywood layer.

Some homeowners, such as the one pictured, may want to use sand bags. Sand bags, though less expensive than concrete blocks, may eventually deteriorate, leaving uneven shielding. Sand bags weigh less than concrete blocks and they will need to be stacked higher to get the same shielding effect.

Have your engineer test your basement floor and footings to assure that they will carry the wall and ceiling weight, and make sure he/she plans for securing the walls and ceiling against a potential 'twisting' motion caused by blast or earthquake. Falling blocks of concrete would cause more injury to the inhabitants, than would the radiation. Stacked six high, the concrete blocks alone will weigh about 1.54 lbs. per square inch. The shielding for a 100 square foot shelter would weigh about 22,175 lbs.

Entrances

About 90 percent of gamma radiation is attenuated by each 90-degree turn. Entrances should have a hall, which forces a 90 degree turn before entering the shelter.

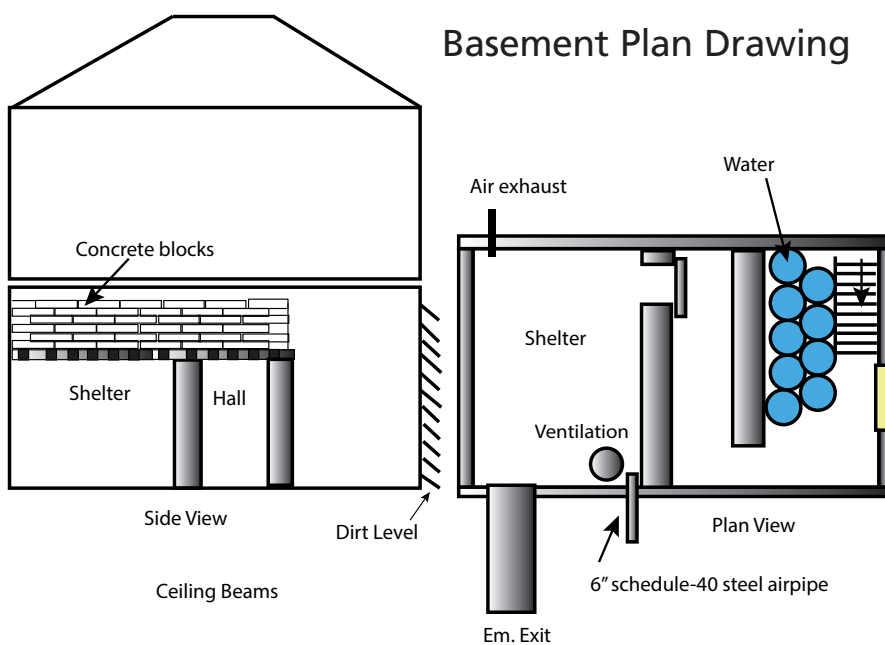
In the plan shown, if the entrance to the shelter faces outside windows, the shelter walls facing the window should be 24 inches thick. Use water or food sup-

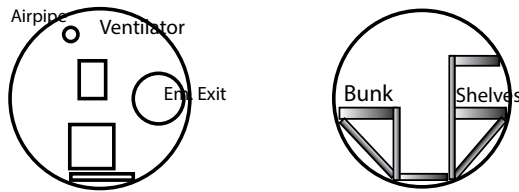
plies to help add additional shielding to those interior walls.

Place an emergency exit into the shelter wall. Core drill a 30 inch hole into the lower part of the wall. We would suggest that you use 36 inch diameter corrugated steel pipe (CSP) welded into an elbow with the horizontal end being no shorter than 10 feet. Weld a flange to the end of the elbow and bolt the flange over the hole in the basement wall. The vertical portion of the elbow should reach grade at some convenient area of the yard. Use a hatch type door to secure the exit.

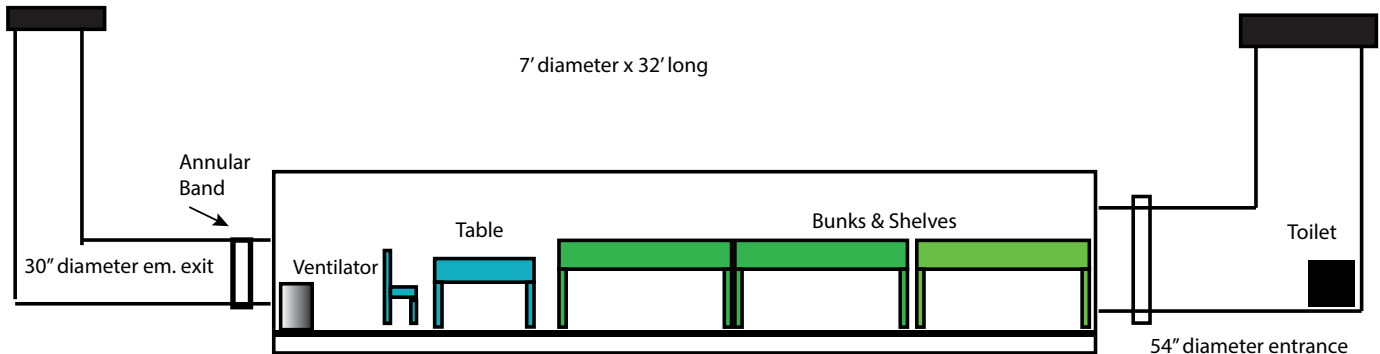


Shelter life must balance comfort, responsibilities, social interaction, and privacy needs.





CSP shelter drawing



Exterior Home Shelters

Exterior home shelters may prove to be less labor intensive and less expensive than interior shelters.

We would suggest a minimum of 4 feet of dirt cover, which will give you a PF of about 1,000. You may want more cover for areas of extreme temperature variations. In most areas, six feet of cover will assure that your shelter will not freeze or become too warm. Flat-topped steel shelters will not carry enough dirt load to provide for proper radiation protection.

CSP Shelters

We have liked working with corrugated steel pipe material for outdoor use. The arch gives great strength, and the design has been tested under actual blast conditions. Diameters up to 7 feet can be constructed from 16-gauge material. We recommend using 12-gauge material for CSP over 7 feet in diameter.

CSP shelters will leak if placed into water. You must not place CSP shelters into a high water table, or into areas where water will accumulate (such as in gullies or at the bottom of hills).

7 Foot CSP Shelters, 16 Gauge

Seven-foot diameter CSP shelters are relatively inexpensive and easily constructed. Ask the CSP provider to weld ¼ inch steel end plates to each end of the CSP shelter. Paint the end plates with a rust inhibitor. You may want to paint the interior of the shelter with white latex



Shelter air filtration system with exit tunnel on left side.

paint. Before painting, carefully wipe down the shelter interior with acetone. It is not necessary, or recommended, to paint the exterior of CSP. Do not weld any items to the sides of the CSP shelter. Welding will weaken the metal, and after a few years the welded area may crack or tear. You can, however, weld items to the ¼ inch steel end plates.



Typical shelter access hatch. Provides security and shelter integrity.

Interior

Place a 2 foot wide, $\frac{3}{4}$ inch furniture grade plywood floor into the shelter. Provide for a 2 foot wide hall. Build narrow bunks and shelves into the sides of the CSP shelter. Weld unistrut to the end plate for mounting of the ventilator (see attached picture). Bolt unistrut to the walls of the shelter at the 3:00 and 9:00 position for DC wiring and DC LED lights. Use $\frac{1}{2}$ inch spring nuts for hanging other items into the unistrut. Each $\frac{1}{2}$ inch spring nut has a 1200 pound pull-out strength and can easily hold a person in a hammock. The use of hammocks will greatly increase your shelter capacity. Place 6-volt gel cell batteries into the shelter and connect them to the DC lighting system. We often connect a fan to the batteries, to keep fresh air moving into the shelter when the NBC ventilator is not in use. You may want an electrician to add an inverter system with AC wiring, as well. We recommend placing a solar system next to the shelter, to keep the batteries in a charged state.

CSP entrances

Always provide two entrances. Ask the CSP provider to cut a hole into the end plates and to weld a one-foot stub of the proper diameter over the hole on the outside of the end plate. During installation, you will connect the

entrances to the stub with annular bands. The provider will guide you on the proper installation techniques for these bands and gaskets. We like 30 to 36 inch diameter exits and entrances between 48 and 54 inches in diameter. In 7 foot diameter shelters, we prefer 30 inch diameter emergency exits, in order to leave room for a ventilation system on the exit end plate.

If you want access to your home from the shelter, weld a flange to the end of the horizontal entrance pipe, and after core drilling a hole into the basement wall, bolt the flange over the basement opening. In most instances, a 90-degree turn is not required with this type of entrance. Choose an entrance location into the home that does not face a window or other outside basement opening. Place the shelter at least 20 feet away from the home, in order to protect the foundation of the house during installation of the shelter.

Doors

We recommend steel, hatch type doors for CSP shelters.

CSP Installation

Hire a geo-technical engineer to test your soil and the depth of your water table. We are not experts in installation and do not install our own shelters. Always hire a track hoe operator with experience in large diameter CSP pipe installation. Let them guide you in the process. CSP shelters should be covered to the top, with clean, $\frac{3}{4}$ inch crushed rock. This type rock is readily available and is used in concrete. Do not use pea gravel. Continue filling to the required level with soil from the excavation, or fill over the crushed rock with road base. If the soil is of a clay type, dig a wider hole and do not use the clay to back fill the shelter. Seven-foot diameter shelters should have a minimum of 4 feet of cover. Seven feet of cover, however, will give excellent blast protection as well.

We hope this information will help you in building a home shelter. Any amount of shielding you can place over and around your sheltered area will greatly enhance your probability of survival. Study the TACDA academy material for post war survival suggestions. The material is on the TACDA web site and is free to all. <https://tacda.org/resources/#TACDA-ACADEMY>

Sharon Packer has a B.S. in Mathematics and Physics and an M.S. in Nuclear Engineering and is an expert in NBS design.



Electromagnetic PULSE HAZARDS

*By Colonel Jim Smith, MSS,
NRP, FABCHS, CPC, CLEE*

Silica-based technology is susceptible to geomagnetic disturbances, solar flares, and electromagnetic pulse (EMP) from weapons. The United States is very susceptible to these problems with its sophisticated and pervasive technology.

The 2018 Electromagnetic Defense Task Force Report called the threat a realistic and credible threat from the perspective of an adversary using this type of weapon or a solar event such as the Carrington Event of 1859.

The Electromagnetic Defense Task Force Report 2018 noted that little planning has been performed on the effects on the military command and control structure, cooling of spent nuclear fuel, and nuclear power facilities. This is disturbing as it suggests that an EMP type attack, or Carrington type incident, might affect a large area of the U.S. rendering communications, power, and any electronics no longer able to function. This would include in the areas most heavily affected by the incident sustained power outages for months, no vehicles able to operate, even mundane items such as electronic watches, battery-powered calculators, and even terrestrial GPS systems may be damaged or destroyed.

In a worst-case scenario, approximately 99 reac-

tors and many spent fuel storage facilities are at risk and conceivably, could enter a crisis state if they cannot be shut down and use cooling water to maintain thermal control. The loss of electronic control, loss of offsite power, and loss of generator power could result in loss of control of these reactors. This could result in large areas of the U.S. becoming contaminated with radioactive material from the plumes from catastrophic failure of reactors and spent fuel pools.

The Fukushima Daiichi nuclear disaster is a good simulation of what will occur in this type setting. Despite the best efforts with many outside resources, the reactors “melted down” and contaminated large areas of Japan with radioactive material. The Japanese nuclear reactor systems are modeled after the U.S. reactors systems and those personnel operating them have similar training and procedures as are used in the U.S.

Recent hurricanes such as Michael, Katrina, and Sandy demonstrated that long periods without power impair survival efforts and catastrophically impair recovery efforts. The effect of a sophisticated EMP weapon using a near space burst to enhance electromagnetic pulse might damage the U.S. electrical grid beyond repair, impair the military’s ability to respond to both external threats and the internal chaos following such an event.

Most disaster recovery plans depend upon external assistance, meaning parts of the United States are still able to continue to function and the industrial base outside the affected area can supply the technological needs to recover. Plus, the undamaged areas can supply food, medical assistance, and supplies, along with fuel, power, and recovery equipment with manpower. In the worst-case scenario, no portion of the United States would be undamaged, and recovery would become a local, and at best, a regional effort. Loss of the electrical grid will prevent modern medicine and hospital facilities from operating, public order will likely break down, fuel will disappear, and since most retail facilities are “just in time delivery,” food and other retail items will disappear within 24 to 72 hours.

Communications will not be available as the EMP would have damaged landline systems, microwave systems, broadcast equipment, along with satellite-based communications. Global positioning will not be available.

Many modern vehicles operating with silica-based electronics will likely be immobilized as these systems will be damaged. Even stored electronic components and parts may suffer damage from a strong EMP event. Lloyds of London has estimated that an event like the Carrington event might cost the U.S. as much as 2.6 trillion dollars to recover.

One might have a chance to prevent a manmade event, but those events from the Sun are beyond the control of man with current technology. Evaluation of the military and government systems of the U.S. show a lack of preparation and dismal response capabilities.

During the solar storm of 1859, intense sunspot activity preceded a strong coronal mass ejection (CME). This struck the magnetosphere of the Earth and generated a strong geomagnetic storm. A similar CME occurred in 2012 but missed the Earth’s orbit. Similar storms, albeit less intense, have occurred in 1921, 1989, and 2014. These did cause widespread radio disruption and the 1989 event caused an extensive power failure in Quebec.

The 1859 Carrington event was so strong that Auroras were visible in the Caribbean and so bright in parts of the continental United States it caused those sleeping to awaken. Some were able to read newspapers via the Auroral lights. Many described the lights as considerably brighter than a full moon.

Telegraph systems throughout the United States

failed with many emitting sparks and shocking operators as the telegraph lines converted the strong magnetic field to electricity. Some telegraph operators were able to transmit even though their power supplies were disconnected.

Solar storms are not unusual and even storms of this magnitude are not rare as evidenced by nitrate-rich ice cores obtained from the Greenland ice pack. The interaction of the Earth’s atmosphere by CME and the resulting geomagnetic storms produce nitrate-rich snow and rainfall, like the method that lightning enriches rain with nitric acid by its interaction with the atmospheric nitrogen.

How does one prepare for such an event? The issue becomes how probable is such an event and does the cost justify the preparation and mitigation costs. At the national level, such preparation and mitigation are certainly justified. At the personal level, one must balance the probability of such an event against the cost of mitigation.

Some of the mitigation efforts are in line with any disaster preparation such as food, water, medical supplies, negotiable items for barter, and the like. Serious preparation would include a system to disconnect external electrical power during any EMP or voltage spike, with a structure wide Faraday Cage installed within the structural components to shield from EMP.

Further, electrical generators and electrical components would have to be isolated from any external power or other connections and shielded with a Faraday Cage rated to dissipate the more likely EMP strength of -800 Nano-Tesla to -1700 Nano-Tesla reported in the Carrington Event of 1859. One must isolate any electrical or metal inputs from the exterior of the protected area or the Faraday Cage becomes ineffective.

Colonel Jim Smith is the public safety director of a rural town and has a master’s degree in safety and a certificate in system safety from the University of California. Smith has written several textbooks addressing the hazards of modern technology, weapons of mass destruction, and nuclear/radiological incidents. He has served on a federal joint terrorism task force and has more than 40 years public safety experience. Smith teaches for the University of Phoenix and Troy University.

Take the **BITE** Out of **FROSTBITE**

By Jay Whimpey, PE

Definition of Frostbite

Frostbite is the actual freezing of body tissues usually at the extremities or exposed areas such as the face or ears. Frostbite can be superficial involving only small areas of the upper layers of the skin, or deep frostbite involving tissues below the skin.

Causes of Frostbite

Frostbite is usually caused by inadequate protection from sub-freezing temperatures. It is rather common for ears or exposed skin on the face to freeze especially in cold windy conditions. Frostbite can also occur when protective clothing becomes wet and ineffective at providing proper insulation against the cold. The hands and feet are more susceptible since there is less body mass and lower circulation in the extremities and a larger ratio of exposed surface area per unit of body mass. If the core temperature of the body falls below normal body temperature then the autonomic nervous system will substantially limit the amount of blood flow to the extremities in order to maintain the proper core temperature of the body. This can allow the extremities to freeze.

Treatment of Frostbite

Frostbite can be identified by a change of color on the skin where it begins to look frozen. In many cases the frostbitten extremity begins to feel warm to the victim. If the frostbite is superficial, it can be treated by adding cover to affected body parts or changing clothing to something dryer and warmer.

If the frostbite is more severe, it should be addressed immediately by finding heated shelter and treating the frostbitten area. If the individual with frostbite is a substantial distance from the proper facilities, plans should immediately be changed to get help as soon as possible. The frostbitten extremity or area with deep frostbite should not be treated while in the field. The continued use of extremity while frozen will not cause too much extra damage and some people have traveled many hours to days with frostbite in order access the proper facilities.

Once there is access to a heated area with the facilities for immersion of the frostbitten extremity in warm water, the frozen clothing should be removed and the affected extremity should be immersed in water between 108° and 112° F. That temperature is about as hot as

can be tolerated by a normal individual for an extended period of time without pain due to the temperature of the water. This thawing process is usually fairly short, lasting 20 to 30 minutes. During this time, the individual may begin to feel a substantial amount of pain and a moderate amount of aspirin may be administered.

Once the affected area is thawed it should be gently dried and wrapped in loose fitting sterile bandages. Movement of the affected area or rubbing should be minimized in order to prevent more damage to the affected tissues. The affected individual should be confined to bed rest for several days to weeks depending on the extent of the injury in order to facilitate proper healing. The area may blister and become dark and then the dead tissue will gradually separate from the affected area. The body knows where the dead tissue is and will recover as much living tissue as possible.

Amputation is rarely necessary even in extreme cases. The individual should not be alarmed by the sight of the dead tissue and various colors it may exhibit. The area should be protected from infection from outside and an oral broad spectrum antibiotic can be administered to reduce the chance of infection while healing.

Jay Whimpey is the president of The American Civil Defense Association and the president of The Utah Civil Defense Volunteers. He is a licensed chemical engineer with a vast amount of knowledge and experience developing new techniques and teaching preparedness skills.



Hypothermia:

How to Prevent and Treat this DEADLY KILLER

By Jay Wimpey, PE

Hypothermia is a lowering of the core temperature of the body below normal levels. It results in feeling tired and the loss of reasoning capabilities because nerve operation is inhibited at lower temperatures.

Physiological Effects of Hypothermia

As the core temperature of the body decrease, the autonomic nervous system will take corrective action causing shivering or involuntary muscle contractions to generate more heat. It will also limit blood flow to the skin and extremities by activating precapillary sphincters and opening shunts between arterioles and venules, largely bypassing capillary beds where the blood is normally distributed to the cells.

Most people have noticed that they have cold hands and feet in cold conditions and normally conclude that they need better boots or gloves to keep their feet and hands warm not realizing that this is the first sign and physiological response to the lowering of their core body temperature. In more severe stages of hypothermia shiv-

ering may stop, speech will be slurred, body actions will be clumsy, and confusion and memory loss may occur.

In extreme cases, an individual will become very drowsy, lose consciousness, and eventually die. Many drugs and alcohol will inhibit the natural responses of the body to cold conditions and accelerate the process. Many victims of hypothermia are people that drink too much alcohol in colder parts of the world.

Causes of Hypothermia

The body can lose heat through the skin and from respiration by contact with cold air to the lungs. The presence of moisture in clothing greatly reduces the insulating properties of the clothing and increases heat loss. Care should be taken to choose proper clothing for outdoor excursions in cold weather conditions.

Close contact with cold metals, other solids, cold water, or hydrocarbon fuels can quickly cool exposed body parts. It should be noted that light fluffy snow will insulate quite well, and that lower layers of snow can be much colder than the ambient air temperature. The lower layers of snow may be as cold as the previous night's coldest temperatures while the upper layers should be close to the current ambient air temperature.

The wind can cause substantially greater heat loss at a given temperature than still air. Proper clothing for the conditions can be rendered totally inadequate in windy conditions and the significantly greater heat loss associated with it. Be aware of wind chill conditions.

Breathing heavily during periods of physical activity can also contribute to cooling. Excursions at high altitudes require much heavier breathing that causes increased heat loss.

High altitudes, with less oxygen available for the body, will require heavier breathing and thereby more heat loss due to respiration. There is also less oxygen to support an individual's metabolism so the potential for hypothermia is significantly increased at high altitudes.

Preventing Hypothermia

When exposed to cold and/or wet conditions, it is important to have clothing that will continue to insulate well even if it absorbs perspiration from the body or moisture from external sources. Multiple layers help insulate better, and materials with minimal affinity for moisture help prevent the buildup of moisture in the clothing.

The objective for most clothing is to hold air in place around the body, but allow some circulation to allow perspiration to be transported away from the body so that the clothing will maintain its proper insulating capability.

Open-cell polyurethane foam is one of the best insulating materials, and it has very little affinity for moisture. Wool is also a good material for cold weather clothing, but it is heavier and not able to insulate as well. Down feathers are great insulation, but it is not a good insulator once it becomes wet. Cotton has high affinity for moisture and is a very poor insulator if wet.

It is important for the clothing be able to "breathe" and allow moisture to be transported away from the body. There are many synthetic shell materials that can repel moisture from the outside, yet allow heated air with the accompanying moisture to escape.

Shoes and boots should insulate from the cold ground, and should also be able to breathe to allow for the transport of moisture. Gloves can be accompanied by heavy over mittens to allow for increased protection. Mittens have less surface area and thereby less heat loss than gloves.

Proper hydration allows the body to produce more heat by maintaining proper metabolism and is essential in cold weather conditions. Colder air is dryer and the

body loses more moisture due to respiration when the air is cold. There is also a tendency to perspire more during short periods of exertion when dressed for cold weather. An individual should be mindful of the tendency to perspire and open or remove clothing in during periods of increased physical exertion. Drink plenty of water while exposed to cold weather conditions. Eating snow directly causes a significant loss of heat for the body and is dangerous.

Proper nutrition is also important during cold weather excursions. Fatty foods are preferable in times of extended exposure to cold weather, with carbohydrates being a close second. These foods provide the energy needed to create heat for the body. Proteins are not as useful for providing energy to heat the body in cold weather.

Overexertion can reduce the body's ability to produce heat and keep the body warm. It is advisable to limit physical activity to moderate levels in extremely cold conditions so that too much perspiration and overall exhaustion are avoided.

Alcoholic beverages tend to inhibit the body's ability to conserve heat by relaxing the arterioles and allowing more circulation at the outer layers of the skin. Nicotine restricts the arterioles and inhibits good circulation. Both should be avoided during exposure to cold weather conditions.

Treatment of Hypothermia

Hypothermia can be treated by providing heat to the body. Warm drinks and foods, removal of cold or wet clothing and replacement with warm dry clothing, and skin to skin contact with other people with normal body temperatures are all good ways to warm the individual suffering from hypothermia.

The key to avoiding problems with hypothermia, as with most problems, is proper preparation in the first place by having the proper clothing and equipment, and by recognizing any issues in the early stages and taking proper corrective actions.

Jay Wimpey is the president of The American Civil Defense Association and the president of The Utah Civil Defense Volunteers. He is a licensed chemical engineer with a vast amount of knowledge and experience developing new techniques and teaching preparedness skills.

Shelter Filtration Q&A

By *Paul Seyfried
and Sharon Packer*

Paul and Sharon,

hope all is well. I am looking to purchase an air filtration system in the next six months or so. I am leaning toward an Andair VA150 system but wanted your input.

Considerations:

- Max over pressure expected (1-5 psi)
- Max radiation levels expected (100 rads/hour)
- General smoke from burning buildings/hardwood forest
- 3,000-4,000 sq. ft. (room empty)
- 5+ occupants

Questions:

- What system do you recommend? Would a VA-75 be appropriate?
- Cost of system?
- Maximum number of occupants possible?

Thanks!

Hi Scott,

You have a very large shelter room. Our VA150 ventilators are designed for pressures in

the 15 to 45 psi range (1 bar and 3 bar systems), and are well within your overpressure requirements.

The filtration system filters radiation particulates, but your shelter would need to be evaluated for the 100 rads/hour requirement. The 100 rads/hour comes from gamma radiation, which is pure energy (no mass) and cannot be filtered.

I would suggest that you send us your plan for evaluation. You would need about 3 feet of dirt cover, or 2 feet of concrete to attenuate 100 rads per hour. We suggest more shielding than this, however, as you cannot guarantee a radiation level. The minimum requirement we suggest is 4 feet of dirt cover or 3 feet of concrete, for a fallout shelter. If you are in a basement, these requirements change. Entrances, too, need to be carefully designed.

The high efficiency filter filters smoke, to a degree, but the smoke would quickly clog the filters in the filtration system. Carbon monoxide from smoke is not filtered. We, therefore, recommend a closure of the ventilation system during the burn time, and that you breathe from the air that is within the shelter. You would have many hours (depending on the number of occupants) of oxygen available in a shelter of your size. Our small 500 square foot shelters, when running a VA150, can house up to 50 people and can be shut down for 4 to 5 hours before requiring an oxygen input from the outside. This requirement may vary, according to temperature and humidity levels.

You did not mention a chemical or biological war gas requirement. Shelters must be sealed and placed in a 'positive pressure' environment to guarantee against war gas intrusion.

One VA150 will positively pressurize 150 meters cubed (5300 cubic feet) of open space. If you have 8-foot ceilings, then you have between 24,000 and 32,000 cubic feet of open space, depending on the height of your ceiling. You would need the equivalent of about 6 pieces of the VA150 to positively pressurize your shelter.

For ventilation, only, I would recommend one VA150 for your shelter. With air ventilation requirements, only, you can house up to 50 people with one VA150.

The price of our complete VA150 system is \$7,500, which includes handling, customs and transport to your nearest international airport. The complete system includes the motor, the pre-filter, the high efficiency filter, both intake and exhaust blast valves, and hoses. The system is configured to run on both electric and manual power. The manual requirement for ventilation, only, is one hour per day per person.

Best Regards

Sharon Packer
801-380-2932

Sharon Packer has served on the TACDA Board of Directors for 20 years. She holds a master's degree in Nuclear Engineering, and is the author of 'Nuclear Defense Issues', a handbook of weapons effects and civil defense survival techniques. Sharon and Paul Seyfried founded Utah Shelter Systems, a company that manufactures special order steel shelters. The shelters feature a Swiss made ventilation and chemical-biological filtration system. Sharon and Paul are the North American distributors for this ANDAIR filtration system.



What if **Yellowstone** **ERUPTS?**

By Martin Poirier

Yellowstone National Park is renowned as a beautiful United States landmark. With almost 3,500 square miles of land, there are geysers (such as the beloved Old Faithful), hot springs, forests, rivers, and canyons to behold. However, the park expands its territory over a volcanic hot spot. What if Yellowstone erupts? Where should you go? How do you protect yourself and your loved ones?

In a super volcano event at Yellowstone National Park, you should get at least 500 miles away from the park to avoid injury and damage from the boiling lava and magma, thick and heavy smoke, and possible tumbling rocks and other land debris. If you want to go further, feel free.

If you're interested in Yellowstone's volcanic hot spot, then you'll probably want to know how likely the volcano is to erupt. I'll tell you in this article. I'll also provide some safety tips in case an eruption ever does occur.

Where Is Yellowstone?

Although Yellowstone is known for being a Wyoming national park, its 3,500 square miles stretch to Idaho and Montana as well. Therefore, if you live in or near any of those three states, it pays to have a volcano eruption preparedness plan in place.

How Likely Is Yellowstone to Erupt?

2017 data from the U.S. Geological Survey cites a low eruption risk for Yellowstone's super volcano: a "one in 730,000" chance. That makes it more likely to occur than you winning the lottery (your chances are one in almost 14 million). It's a little less likely to happen than a lightning strike hitting you, in which the chances are one in 700,000 in the U.S. annually.

While the likelihood of the super volcano erupting may seem low, when you consider how common lightning strikes are, you realize there's more of a chance than you thought.

A 2014 Vox article mentions that Yellowstone eruptions are pretty few and far between. A more recent one occurred some 664,000 years back. Two others of note were 1.3 million and 2.1 million years back respectively. Does that mean we are overdue or thousands of years from another eruption? That's for you to decide.

Where to Go If Yellowstone Erupts

The state at the greatest risk during a Yellowstone eruption would undoubtedly be Wyoming. Also at severe risk are Idaho and Montana since these two states house parts of the national park as well. Surrounding states that should also consider evacuation are South Dakota, North Dakota, Colorado, Utah, Oregon, and Washington. In a severe event, even states like California, Kansas, and Nebraska could be at risk of damage from the super volcano.

If Yellowstone erupts, you should plan to travel at least 500 miles away from the site of the eruption, maybe further. Since Wyoming, Idaho, and Montana are some of the northernmost states in the country, heading south would be one good option. Going east is another smart plan. What matters most is getting far from any affected states.

A Yellowstone volcanic eruption, while being a very serious event, would not impact the entire country. Once you got out of a 500-mile radius of the eruption (or more), life in these southern or eastern states would

more or less be going on like usual. You could stay at a hotel or even with a friend or relative until the volcano finished erupting and authorities deemed it safe to return. Some states might even have shelters for volcano survivors depending on the severity of the event.

Volcanic Eruption Concerns

There are a slew of concerns that could arise in the event of a volcanic eruption at Yellowstone or elsewhere. These are:

- Very hot lava and magma burning down houses, wrecking vehicles, and potentially destroying entire cities and towns
- Said lava and/or magma causing severe burns or even death if people were to get too close
- Tumbling rocks and other land debris, which can destroy vehicles, crush homes, and cause serious injury and death to passersby
- Thick, smoky air that is dangerous to breathe for prolonged periods and could also cause death
- Traffic standstills as everyone tries to evacuate the same area at once
- Deciding what, if anything, to pack and knowing that what you leave behind will likely be destroyed
- Gathering all family members in one place
- Selecting the state to travel to and making accommodations
- Having the money to pay for accommodations if necessary (if you're not staying with a friend or family member or at a free shelter)
- Getting treatment for any injuries, including lung issues and other internal damage from smoke inhalation

Safety Tips During and After an Eruption

To keep your loved ones as safe as possible, I do recommend you take the time to make a volcano eruption evacuation plan. This should be done long before any risk of volcanic eruption is on your radar. Decide where everyone will meet, what your exit strategy will be, and where you will go if and when Yellowstone erupts.

Be sure to incorporate these safety tips into your evacuation plan:

- Try to avoid driving if the volcano has begun erupting unless you can go less than 35 miles per

hour. The ash from a volcano will melt or otherwise destroy the metal components of your car, including your engine. Get out before the volcano blows to avoid becoming stranded.

- In some instances, you may be forced to stay in your home during a volcanic eruption. If you close every vent, stuff up your chimney, and seal your doors and windows completely (no gaps!), you will be your safest.
- When venturing outdoors in volcanic conditions, make sure you always have a respirator mask on (N-95). This should cover your mouth and your nose so you're not breathing in volcanic smoke. You should also wear eyeglasses or goggles, pants, shirts, and even gloves. The less skin exposed, the better.
- Don't evacuate unless it's recommended you do so. Otherwise, you could put yourself and your loved ones in a deadly situation.

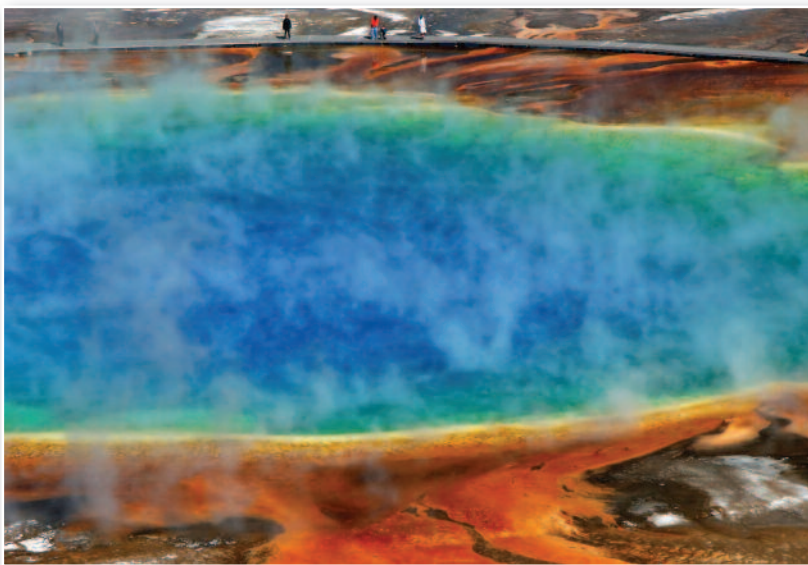
While there's a very low likelihood that Yellowstone's volcano would erupt again right away if a first eruption occurred, you might want to consider relocating to another part of the country (or even the world) in the aftermath. Living far away from areas with even semi-active volcanos is best.

Conclusion

While they're certainly not everyday events, a volcanic eruption can destroy homes, vehicles, and lives in a second. If you live near Yellowstone National Park in Wyoming (the park expands to Idaho and Montana as well), then it is recommended you create a volcano eruption preparedness plan with your family.

The chances of an eruption may be low, but getting 500+ miles southbound or eastbound from the site of the volcano before an eruption is your best bet for being safe. If you're caught in the volcano, keep the above tips in mind to avoid injury and stay alive. Good luck!

Martin Poirier is the creator and an author of <https://teamhacklife.com/> and a YouTube channel by the same name, a Preparedness, and Survival resource geared for anyone wanting to keep themselves and their family safe during life-threatening events and dangerous situations. Martin works full-time at an electrical corporation and has been working in the safety field for over 10 years. He is a husband and proud father of three children.





By *Bruce Curley*,
TACDA Vice President

Ask yourself, “How would I communicate with my loved ones if something really bad happens?”

Most likely, you will use emergency communication tool some that you have already, and others you could benefit from, such as those below.

What are emergency communication tools? They are hardware and software that connect you to your family, friends, colleagues, and community, as well as with first responders, support systems, and other family members.

Plan for the emergency communication tools you need *before* the event to be able to communicate and it will make your response faster, better, and more effective. Learning and using these tools will give you a higher chance of successfully dealing with an emergency.

Have a Plan

Your circumstances and emergency communication tool needs are as unique as you and your family, so think now

about how you would communicate with your family in an emergency. Identify the communications tools you would need to be able to reach them in an emergency and make a plan for how to set those up.

Part of that plan must be to learn how to use the communication tools that are the most useful for you and your family. The suggestions listed below may be useful to you. If so, take the necessary steps to set up social media accounts and begin to learn how to use the applications. That way you will know how to use them, have exercised them, and are more likely to use them successfully before, during and after an emergency.

No one tool listed below is used by everyone, so use all or most of them to make sure you cover all the emergency threat matrix.

To Begin

Establish who you need to contact during an emergency. Make a list and distribute that list to all parties.

List phone number, social media addresses, email addresses, for everyone on your list. Make sure one or two contacts are out of state. Also, make sure everyone on the list knows they are on your emergency contact list.

Identify a primary point of contact with whom you will work and make sure they know your plan. Another option is a “call tree.” One person calls two more who call two more and so on. This method carries the message quickly and lessens the burden on one person being responsible for making all the calls.

Emergency Communication with Local Officials

Local emergency management officials (police, firefighters, emergency operations centers, public safety offices, emergency operations centers, and more) use all, some, or a mix of the emergency communications tools available. Investigate those in your area and connect with them.

Here are a few local resources that I use:

<https://www.facebook.com/MountAiryPD/>

Mt. Airy, MD Police Department Facebook

<https://twitter.com/MDMEMA>

Maryland Emergency Management Agency Twitter

<https://twitter.com/MDSP>

Maryland State Police Twitter

<https://www.facebook.com/CarrCoMDPubSafe/>

Carroll County DPS Facebook

Cell Phones

Cell phones are obvious as we use them every day to communicate. Most of us have our loved ones and their telephone numbers in our cell phones. But cell phones require additional items in an emergency.

For example, have an extra power cable in your house and car. Keep a charging adapter in your car cigarette lighter outlet. If electricity is cut off you may need to use the battery in your car to charge your phone. If power is out you may need to use your car to charge your cell phone. A solar phone charger is another option in a power outage.

Instant Message

WhatsApp, Skype, ezTalks, Viber, Meebo+, Google Hangout, Kik, WeChat, and Messenger are examples of instant message apps and services. These and other instant message apps are available for both Android and iOS. They are a useful and basic tool for communicating normally and during an emergency.

Social Media

Social media is useful for sending loved one’s emergency messages, and for getting updates on their status.

When cell phones do not work, or the telecommunications networks are overwhelmed preventing calling and texting, social media apps offer an alternative way to communicate.

- **Text Message:** Text messaging is a mobile phone service offered by phone companies (Verizon, T-Mobile, etc.) that usually have a 160 character limit.
- **Twitter:** Twitter offers instant updates about what is happening during an emergency. This makes it easier to know what is going on and to monitor developments. It provides timely information you and your family can act on. As such, it is invaluable. When you have a Twitter account already in place, it’s just a matter of using the existing media during an actual emergency. To follow tweets on your phone, you may want to text “Follow [Twitter handle].” In addition, Twitter’s FastFollow has other features, which lists the most recent tweet for a given Twitter feed. You may want to have several emergency Twitter accounts, one for alerts, and one for information. Use Twitter’s hashtag (#) feature to follow information that you may want to monitor (#civildefense, #emergencymaryland) so Twitter keywords are flagged with a # in the tweet.

Note: Twitter’s strength: instant information, can also be its weakness: incorrect instant information. Always compare what various people and sources are saying to best determine what is really going on.

- **Instagram:** Half of the users of Instagram now use it as a Messaging App. Instagram allows you to private message other users on the platform using the feature called Direct Message. This feature lets you send messages to one or multiple people (a group). Using Instagram is a good option to use during an emergency.
- **Facebook:** In addition to your existing Facebook account and your instant links to family and friends, Facebook offers a new feature useful to emergency communications called Local Alerts.* It allows you to send a Facebook notification to page followers who live in your area, whether they have opted into that notification or not. They are used for urgent or emergency information.

Currently, Facebook Live is the only other post type on Facebook that sends out a notification. Local alerts are a valuable tool in emergency communications, one that should only be used to relay urgent information.

Emergency Communications Apps

There are a wide variety of emergency communication apps available you can download to your cell phone. Here are a few examples:

- **Bugle:** Helps your friends and family find you in case you have an emergency.
- **Life 360:** Establishes an immediate connection with your friends and family via text, email or voice call. It notifies them about your current location and comes with a panic alert feature.
- **First Aid by American Red Cross**—Offers users basic first aid lessons, help instructions, and a red button to contact 911, disaster preparedness check-lists, and other American Red Cross resources.
- **SirenGPS:** Creates a collaborative network of emergency management and responses where the entire community stays connected to first responders.
- **Patronus:** Shares your location with mobile 911 service dispatchers who can access your location.
- **ICE:** In Case of Emergency stores crucial information about you for responders and hospital personnel. Lists your contact information so responders know who to contact.
- **Red Panic Button:** Sparks off an early warning and vulnerability alert system, one-to-many communication the moment you push the red panic button.

Amateur Radio

Amateur Radio (also known as ham radio) is used to communicate without the Internet or cell phones. Therefore, it is an excellent way to communicate when other communications tools are not operating. Also, you can take a radio wherever you go! In times of disaster, amateur radios have reliably assisted communications in emergencies for over a hundred years. When other communications tools fail, amateur radio is an excellent option.

Two Way Radio (Walkie-Talkie)

A two-way radio is a portable, hand-held device that can transmit and receive radio communication. Even when cell phones are not working or the power grid is down, two-way radios operate and convey critical emergency information. They are an excellent first use or backup emergency communication tool.

With their push-to-talk functionality for instant communication, they are much faster than cell phones. They come with extreme ease of use, just the push of a button can transmit your message to an entire group of people. They can also withstand harsh environmental conditions like heavy rain and dust.

Two-way radios can send and receive text messages for quick and discreet communication. In addition, two-way radios don't rely on cell phone networks. That is a huge benefit in widespread emergencies where reception may be congested or even stop altogether.

Drone with a Camera

This may seem like an unusual tool to include with the others here, but drones have been proven to be invaluable tools for use in emergency events by surveying and reporting the extent of the damage from a disaster. For example, when a tornado hit my own town of Mt. Airy, MD*, the video that was taken by a drone was extremely useful in recording the damage so that homeowners and farmers could quickly file insurance claims.

Get Started Now

All these suggestions offer advantages as communication tools. It is important to set them up, use them, and become familiar with them before an emergency. I encourage you to take advantage of these suggestions; for the health, safety, and survival of you and your loved ones. A small investment of time now will yield large dividends in your future security during an emergency event.

Bruce Curley has studied, taught, and practiced civil defense for 35 years. He is currently serving as Vice President of The American Civil Defense Association. More of his articles can be found at <https://poetslife.blogspot.com>

*<https://www.facebook.com/help/publisher/572490746512593>

*<https://poetslife.blogspot.com/2018/11/ef-1-tornado-lessons-from-mt-airy-md.html>

Alternative Water FOR *THE* LONG HAUL

By Paul Seyfried

In an earlier issue of the Journal, I suggested the concept of alternative power systems as a means to vastly improve a post-event lifestyle and even protect health. One of the prime needs in sustaining life is water, and by that I mean, safe potable water. While it is possible to convert small quantities of ditch water into reasonably safe drinking water using some of the various counter-top drip filters or one of the better backpacker filters (supplemented with extra steps to pre-filter and chemically attack viruses), the painstaking effort to go this route is going to occupy a very large chunk of your daily routine. Such filters will become useless in a few weeks of heavy use.

All of this assumes you have a practical water source near your point of need; your house. If you must walk 40 blocks to the water source, you will need another approach to the problem.

Our family and friends desired a next-level solution to the water problem. In our case, a well would cost over

\$35,000, and that didn't include the energy system for operating the pump. But we did have a stream that runs year-round without any industrial polluters sited upstream. Our task was to select the best way to process this water in abundant quantities for drinking, cooking, showers, and flushing toilets. [There's more than one way pathogens can gain access to your body.]

After some research, we settled on the Lake Water System, manufactured by Vitasalus, a company located in Michigan (<http://www.equinox-products.com/LakeWaterSystem.htm>). While most other filters intended for use on ditch water have at most, one or two filter processes, this system uses six stages to capture or kill bacteria, viruses, cysts, particulates and deal with chemical pollutants. Your city uses between 19 and 23 steps to treat your drinking water, why would you expect a \$79 backpacker filter to accomplish the same thing for the rest of your life? It can't, and it won't.

Photo #1 shows the initial installation of the Lake Water System in our cabin. The stream water is carried to the building through a one inch diameter PEX tube,



buried 48 inches below grade. It has access to the water flowing under the top layer of ice during winter months. A Jet pump pulls the water to the filter system and pushes it through all stages of treatment and into a 500-gallon storage tank. It requires 1500 watts of 120 volt AC power to accomplish this (that's where alternative power comes in).

The first stage is a 20 micron sediment filter to catch coarse debris before it enters the in-line chlorinator and retention tank, where the bacteria and viruses spend quality time together before moving on. It is designed to function on calcium hypochlorite, a dry form of bleach that has a much better shelf life than liquid sodium hypochlorite.

After the retention tank, the stream water passes through a 5 micron and .35 micron filter, then through a carbon filter where the chlorine is absorbed (along with over a hundred other organic chemicals such as fertilizers, pesticides, herbicides, MTBE, and industrial pollutants. Carbon filter life is said to be 700,000 gallons or seven years (100,000 gallons per year for 7 years).

The last stage in the system is a large Sterilight UV sterilizer, capable of disinfecting up to 8 gallons per minute, so long as particulates do not exceed one micron (See photo #2). The sterilizer has a ballast that tracks bulb usage and indicates when the bulb is due for replacement (every year of accumulated run time). The UV lamp pulls just 60 watts of energy.

We run batches of water through the system when the tank gets half full, and allow the UV bulb to run for ten minutes before pushing water through the system.

As of now, the volume of water flow averages around 5 gallons per minute, a little more than half of the flow recommended for the UV light. That means water will receive almost double the UV exposure to kill or sterilize any life form that may have wriggled through the filters. No penalty for overachievement. The small gang filter below the Sterilight is a Water Pure Technologies nano-filter tasked with making sure the stored water is safe before heading to points of use in the building.

State lab tests from the Lake Water System show zero coliforms, and .014 parts per billion nitrates. It's better than West Jordan City water.

Technology marches onward, and new systems are emerging all the time. Last year we also purchased a Water Pure Technologies whole-house filter system that has great performance: <https://www.waterpuretechnologies.com>.



1. Initial installation of Lake Water System.



2. Large Sterilight UV sterilizer disinfects up to 8 gallons per minute.



3. Gang filter installed in parallel line flows through UV sterilizer.



Check out our seed saving videos if you want to see some of these techniques in action at: <http://bit.ly/seed-saver>.

Seed Storage Fundamentals

You made it to the point where you have collected a number of seeds from your harvest. Next, you want to ensure that they are stored away properly for the next growing season. Make sure that you follow these guidelines to ensure your seeds germinate for you on your next sow.

Label each variety of seed that you collect. Keep notes on how the variety performed and some information about the growing conditions. You most likely won't remember this next year and having these details written down will help.

Light, heat, and moisture are the enemies of saving seeds. It is best to put your seeds in some type of container that is shielded away from heat and light. For years, we have stored our seeds in mini coin envelopes, tucked away in dark sealed plastic containers in our basement. We have had seeds germinate from 10 years ago using this simple method.

It is best to freeze seeds for longer periods of time. You want to ensure that they have been sealed specifically in some type of Mylar packaging. Opening and closing these types of seed packets each year may damage the ones you don't use. The fridge or basement is fine for the shorter storage seeds you plan to plant each season.

Hopefully, you learned that you need to add seed saving to your toolkit. It is not a complicated skill to learn and if done right will also save you money at the market each year. The process of saving seeds is a method of preserving our past and ensuring survival for generations to come.

Jeremy Starke has been practicing the science of gardening for 35+ years. He is the founder of the site Green Thumb Gardener where he crafts resourceful guides about vegetable gardening. Other helpful articles can be found at <https://gardenerthumb.com>. His gardening techniques are also available to view on YouTube at <https://www.youtube.com/c/greenthumbgardener>

Photo #3 shows the gang filter installed in a parallel line that also flows through the UV sterilizer. Flow rate is 20 gallons per minute and is 99.9999% efficient against viruses, 99.9996% efficient against bacteria.

Note: the flow must be slowed to no more than 8 gpm for the Sterilight. I would be happy using this system alone along with the UV unit. Filter change interval in city water is 250,000 gallons. I have a 5 micron pre-filter in front of it to extend element life on stream water. The large 4.5-inch x 20-inch cartridges vary in cost, but a full element replacement averages about \$200.

These two systems have high-production, high efficiency water treatment systems that can keep your family supplied with plenty of water at pre-crisis levels for decades provided some spare parts and alternative power is provided by the user. No doubt, there are others out there, but these are the systems I have found to meet our needs beyond the barreled water concept.

Paul Seyfried has been involved in serious personal readiness projects since 1988 and is a partner in Utah Shelter Systems Inc. He has enjoyed working with many consultants from various national laboratories and authors from a wide variety of preparedness topics.



TACDA Refreshed

By *Roseanne Hassett*
 Manager of The American
 Civil Defense Association

It has been a pleasure and honor to be able to serve you as the new manager of TACDA. The past several months has been both challenging and rewarding as I have worked to implement many changes to the organization to give TACDA a refreshing new look and feel.

One of these changes was the rebuild of our website <https://tacda.org>. Previously, the website did not have the capacity to meet the needs of our members and was incapable of supporting any growth by TACDA. New and modern features were desperately needed to get the TACDA website on the right path. One of the new features is an advanced search field at the top of the *Journal of Civil Defense* page that I think you will find helpful in exploring specific topics of civil defense you may be interested in.

As I prepared the new *Journal of Civil Defense* Archives page on the website, I was able to read many past issues of the Journal. I found that there is a wealth of knowledge on civil defense issues that can't be found anywhere but from TACDA.

What a thrill to be able to bring to light the many decades of service through education, from past and present highly intelligent, wise, patriots who care deeply about our country, and its people and their prosperity. It is such a privilege to be a part of this organization. It is truly special!

Our improved website <https://tacda.org> is now live. I encourage you to visit and get to know the new site. One of the first things you may notice is that TACDA memberships are now *free for life!* The mission of the American Civil Defense Association is to empower individuals, families, and communities through education to be prepared for and survive both natural and man-made disasters and emergencies. By offering memberships for free we are better able to achieve this goal.

Here is what you can expect from your TACDA *life-time* membership:

- All memberships are now FREE for LIFE. Your free membership includes unlimited access to all *Journal of Civil Defense* issues as well as unlimited access to the entire website.
- Donating to TACDA is now easier than ever via the website.

Look for the new donate buttons within the website pages. With free memberships, TACDA will rely more on membership generosity to help fund the organization's costs rather than a membership fee model. With the potential for many more members, we feel this model will allow TACDA to serve a larger member base better with a hope of providing even more benefits as we grow. As always, your TACDA donation is fully tax deductible.

- If you have paid \$36.00 or \$12.00 for a contributing or on-line membership within the past 12 months, your subscription will be honored, and you will receive hard copies of the *Journal of Civil Defense* in the mail just as in prior years until your subscription expires.
- After your current subscription expires, new hard copy Journal subscriptions may be purchased at a rate of \$12.00/one year, \$22.00/two years, and \$30.00/three years. Journals will be mailed on a regular basis, in April and October.
- All members will receive a FREE e-Journal via email twice a year, also in April and October.

We hope you will take advantage of the great savings on the Journals, and that you will get acquainted with the new website <https://tacda.org>. We are looking forward to growing the TACDA family and getting to know new members.

Please spread the good news and invite your family and friends to join us!

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The American Civil Defense Association is now on Facebook!
Take the time to LIKE us and receive more valuable links and updates!

TACDA Memberships are now
FREE *for* **LIFE!**

Visit tacda.org

We are pleased to announce that memberships to the American Civil Defense Association are now given at NO CHARGE. The mission of The American Civil Defense Association is to empower and equip individuals, families and communities through educational means, to be prepared for emergencies and disasters.

By giving life-time memberships, we are better able to achieve this goal!

Become a member now and receive information and resources to better understand current threats and practical solutions for handling emergencies.

www.tacda.org

TACDA™, is a registered 501(c)3 non-profit, non-political organization.
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