A DIY Disaster Kit

Table of Contents

1 Water
2. Shelter and protection from environmental elements
3. Fire and light
4. Nutrition (food & cooking)
5. First aid and medical
6. Hygiene
7. Communication and signaling
8. Tools and repairs
9. Safety and defense
10. Travel and navigation
11. Morale and mental health
12. Important documents (passports, insurance, license, etc)
Capstone Project - A way to carry all of your 'stuff' that is both inexpensive and low key.

Foreword -
I've written a series of post-apocalyptic books called the *World of Chërnyi*. In that series, the protagonists are faced with issues and solve them, not because they are super-human, but because they have some training and use their smarts. I mention a variety of items used by these characters, from a Svea or Trangia stove to tarp shelters.
I've written this Appendix as a companion to the series for people who want to be prepared for a disaster. .

Despite what many see on the television or in catalogs, your *needs* to live in a post disaster environment are few and fairly simple. These needs can be covered for a lot less than the "Professional" pre-pack *disaster kits* sold on-line for hundreds of dollars. I'm not going to pretend this Appendix is the be-all, end-all for disaster kitting. The sheer diversity of climate types across the world's landscape makes a one-size-fits-all document *impossible*. This series simply looks to provide enough information, in one place, that will allow you to plan and assemble a short-term disaster kit, on the cheap, specific to where *you* live.

The focus of this series is on a kit that can safely sit in a closet ready for use if needed. This is why I have focused on a low cost kit. You will need to pull the kit and swap out the food at least yearly, twice yearly would be better. I'll list a couple of options on that part as well.

I've tried to write this series in simple, easy to understand English, using a Question and Answer format as part of the information. This layout should permit you to quickly find a topic. Once you find a topic, you then can read a question and answer section that should give you more detail. Photos and images are placed separately at the end, away from each chapter's text to make your reading a bit easier.
The capstone project for this series is for you to assemble a solid kit with the things needed *for you* to live for three to four days, not just survive. Using items you likely have around the house already will save a lot, both money and time. There are a couple of items I will suggest for purchase, but in many cases, I'll also identify one or more nearly free alternatives.

You can safely store this kit in your closet to grab& go when needed, just as you might a fire extinguisher. But like that fire extinguisher, practice makes it and you, more effective. Fire extinguishers should receive annual maintenance, so this kit should be pulled out and *checked at least yearly*. The food will most certainly need to be exchanged yearly.

Once you have assembled your kit, you should then use your kit. Use it on a simple overnight campout or two so that you understand *how* to use the items in the kit *before* it becomes necessary. Even camping out in your back yard will give you much of that experience.

Good luck! You've just taken the first step on the journey to be better prepared to deal with situations that may force you out of your primary residence.

DKR/dkr

Overview

The daily news shows or tells of stories filled with disasters of all kinds: floods, wildfires, massive snowstorms. Sometimes even more frightening are the disasters made by man: train derailments, chemical spills, factory fires, riots and the like.
These stories can be frightening, what if you lose power for days or even weeks? What if you have to flee your home? What will you do? Where will you go? Many people are so overwhelmed just with just the *thought* of planning for a disaster that they give up before starting. Don't give up just yet.

As a Certified Disaster Recovery Planner, I've spent years advising major corporations on how to prepare for and recover from a disaster. I've also written more than a few Response, Recovery and Restoration Plan sets. In those same years, I've found that this aspect of life is something that most of us have either overlooked or frankly, ignored for our own home life. *Being prepared need not be expensive or complicated.*

This Appendix was initially a series of twelve condensed guest posts for a fellow author's blog, each covering a specific area. All of that information and more, is in this document. These steps are relevant whether you are forced to leave your home or are able to stay in your home to shelter in place.

Water.
You need at least two liters per person per day, *minimum*, just to survive. If you are traveling or working, plan for a gallon per person, per day. This Chapter covers gathering, storage, purification and suggestions for transport of drinking water. I discuss the difference between water filters and purifiers, and why that matters. More than one type of filter is described.

Shelter and protection.
An inexpensive tarp and some cordage will go a long way to keep you out of the weather. I show you how to make the most of simple materials to provide shelter from the elements. Clothing is discussed as part of an overall 'shelter system'.

Fire and light
If outdoors, you may need a source of heat to avoid hypothermia, cook food and provide light to perform tasks after dark. I discuss a variety of inexpensive stoves, and show you how to make a pair of stoves that burn a common commercial product. I'll walk you through some choices in flashlights, lanterns, and candle lanterns. The last part of this chapter discuses the advantage and disadvantages of a campfire.

Nutrition (food & cooking)
This Chapter focuses on putting together your own meal, ready to eat (MRE). Using commonly available long shelf life commercial products, you can make your own tasty

and easy to cook or heat to eat meals. I discuss several common problems with home-made MREs and tell you how to avoid the problems. Finally, since you should store what you eat - and eat what you store, I know you'll find eating these meals no problem.

First aid and medical

As a former licensed EMT and having worked in the Air Force as a military medic, the focus here is on the *training* you have. I outline a basic First Aid Kit (FAK) and why this is important. I describe an advanced FAK, one that is layered. I've made some lists to help you gather the supplies you might need or to buy that are appropriate and inexpensive. The types of injury you can treat with the FAK are discussed as are some issues related to Over the Counter medicines. While you can make a very nice FAK for less than a commercial offering, **training** is one area where you are advised to obtain a commercial offering. I list sources for hands-on training and give you sources on the 'Web for follow on and self-training.

Hygiene and clothing

More men were lost in the Civil War to poor sanitation than were ever killed in battle; this is true for the Boer war as well. I cover basic field sanitation, describe ways to wash your clothes in a disaster situation and list ways to bath while in less than ideal conditions. Being clean isn't about smelling bad, it is a health issue. Bears can poop in the woods, but you'll need a sanitary solution for your waste. I describe and illustrate methods for safe disposal of human waste.

Communication and signaling

Communication is more than a cell phone. In this Chapter, I cover communications planning, alternate means of communication. I'll cover commonly available communication equipment. Specifically, MURS, GRMS, CB, FRS and Ham radio are discussed at length. I even discuss crystal radios for fun and battery free listening.

Tools and repairs

In this Chapter, I discuss the common, lightweight tools you should have on hand for use in a disaster. The classic saw of "A stitch in time saves nine" is more correct than not. I describe a small but comprehensive sewing kit and a larger tool for use in repairing large tarps, backpacks and the like.

Safety and defense

This Chapter is a brief discussion of safety issues faced by those displaced in a disaster. I list ways to protect yourself and family members, your valuables and offer suggestions on ways to avoid problems before they impact you. A brief discussion covers the pros and cons of carrying a firearm. Since laws vary so wildly, I cannot offer specifics for your area.

Travel and navigation

If you can't tell the players without a program, you'll find travel far more difficult without a map. I'll discuss common map products, then provide a listing of where and how to obtain free or low cost map products for your use. I also cover compasses, and point you

to free, on-line training sources for the use of your compass. While a GPS receiver is nice, it does have some real-world drawbacks, I discuss those drawbacks.

Morale and mental health
If you have children, you already know dealing with a bored child is almost as bad as dealing with a bored adult. I discuss some low cost and light weight items to carry that can make a difference in the inevitable down time faced when away from home and familiar surroundings.

Important documents (passports, insurance, license, etc)
It's a fact of life that we all have a paper trail following us through our life. If your home is damaged, or destroyed, having the right papers can make a major difference in how rapidly your life can be restored. I discuss the documents you should have with you, and what other measures you can take to safeguard important documents such as birth certificates, DD-214s from military service, marriage certificates, and insurance papers.

The capstone project for the series is to build a take away 'bag' with the essentials for **four days** for **one person** using all of the information covered in the series. In this case, the bag will be a Yukon ruck, made from your tarp and holding the items you need should you leave your home. The capstone project assumes you have motorized transport.
Remember - *Being prepared doesn't mean you have to break the bank.*

Chapter One
Water

"*Without the taste of water, cool water. Old Dan and I with throats burned dry. And souls that cry for water. Cool, clear, water.*" Sons of the Pioneers.
A person can live without water for about three days, after that, you face a slow and painful death. Not just any water will do, it must be clean and free of pathogenic organisms to be of use to humans. As I noted in the overview, bad water has killed more people than all the wars in modern times.

How much water do you need each day?
You need *at least* two liters of clean water per person per day, minimum, just to stay alive. If you are traveling or working, plan on at least one gallon per person, per day. For working in hot or hot and humid weather, plan on at least five gallons per person, per day.

Where do I find water? What are good sources for water? Is some water too dangerous to use?
I'll cover this in two parts - urban water sources and water sources you might find in areas away from the city.

What is urban water?
Urban surface water is generally not safe to drink without serious and technically complex treatment. By this, I mean streams flowing through developed areas, lakes, ponds or other water catchments. Fountain basins for example, that may be found in or near urban areas *are not* a good source of water. These sources of water normally contain a wild variety of contaminants. These contaminates range from animal fecal matter and human sewage to heavy metals, petroleum products or pesticides. For this reason, most 'public' sources of surface water are not safe for consumption. Even boiled, they are too problematic to consider due to the wide range of contaminants.

Are there any urban surface water sources that I could use?
Some surface water *may* be used, but *only* with treatment. Privately owned swimming pools, that you *know* have been well maintained and have no external contamination sources, such as runoff from adjoining land, *may* be safe to drink after minimal treatment.
Rainwater collected from rooftops may **not** be suitable for use owing to contamination from the roofing materials, debris or other contaminates present on the rooftop. However, rainwater collected using known clean surfaces, like your tarp and then stored in clean containers is an excellent source of drinking water.
Water collected from hot water tanks, the toilet tank or other internal building water storage areas may be safe to drink with minimal treatment.

Please note that unless you are *certain* the water is from a potable source, *do not* consume the water without treatment.

Even if you are outside of developed or urban areas, surface water is still likely contaminated, but these contaminates are normally within your ability to treat with the simple resources available to you in a disaster. Animal or human waste is still a concern, as are pesticides, but are usually in low enough concentrations to allow treatment with commonly available methods.
Running springs, where you can find the source, and steams fed by springs are two good sources of water. Many springs on public land have been safety tested; these are normally posted by the agency or person who performed the test.
Clear, free running streams generally make a good water source, as do small ponds fed by running streams. Again, unless you know the source to be tested and deemed potable by a reputable health authority, *treat the water before you consume it*!
Any well water, urban or rural, should be treated unless you know of recent testing showing the water to be potable.

Brackish water, salt water and water with high levels of alkaline as is often found in the Southwest U.S. requires specialized water treatment systems to render the water safe to consume. These reverse osmosis systems are beyond the scope of this series.

Can you safely gather water? Yes, for example, in one of my other books, "*Tales of the Chërnyi*", the character Steven Stone gathers water by putting his empty water bottles under the edge of his shelter tarp, capturing the rain runoff for ready to drink water. You can do the same.

<u>Okay, I've found a source and gathered the water. How do I store the water? What makes a good storage container?</u>
Storage of treated and untreated water must be separate. It does you no good to put treated water into a container that's held untreated water, so marking your containers is strongly suggested. Use a P for potable and a D for dirty, for example. Another possibility is clear and colored soda bottles. Use clear bottles for potable, colored for water that has not been treated. You get the idea, make it simple for yourself.
A good container has a wide mouth, a good, leak-proof cap and is of a size that is easy to handle, depending on your location. By this I mean that a one quart container is easier to carry in your backpack, where a five gallon bucket or purpose built container is a good choice for a fixed location where you or your family may decide to stay. Remember, at eight pounds to the gallon, any container over one gallon is going to be difficult to carry for any distance.

<u>How can I treat water to make it safe to drink?</u>
Water treatment and purification can use one of several methods. These treatments are broadly defined as:

Chemical treatment. This method uses chlorine dioxide, unscented bleach (sodium hypochlorite), iodine, or calcium hypochlorite to make water potable. While there are other chemicals, they are normally limited to professional applications.

Heat. Pasteurization of water using heat to boil the water is a simple and well known process.

Filtering in conjunction with chemical use or purifying with an advanced filter system offers a good choice as well.

Before I go further, I have a couple of important notes.

Iodine - The Department of Soil, Water, and Environmental Science, University of Arizona, tested iodine treatment for efficacy in water contaminated with Cryptosporidium oocysts. They found that just 10% were inactivated after a 20-minute exposure to iodine used according to manufacturer's instructions. Even after 240 minutes of exposure to iodine only 66-81% oocysts were inactivated. These data strongly suggest that iodine disinfection is not effective in inactivating Cryptosporidium oocysts in water. Because this organism is common in all surface waters, it is recommended that another method of treatment be used before ingestion. Iodine is effective against viruses common to surface water.

Commercial bleach - Bleach (sodium hypochlorite) 5+% or 6% by volume, like you buy in the grocery store, degrades fairly quickly into salty water. Use only new or nearly new bleach to treat water! DO NOT store drinking water in bleach bottles.

How do I use chlorine dioxide tablets?

Always follow package directions!

These tablets are a shelf-life item. Check expirations dates twice yearly and follow vendor recommendations for time of treatment, usually a minimum of four (4) hours before consumption. Usually the product is used as one tablet per liter of water, more if water is very cold or cloudy (turbid). One brand of this product, Chlor-floc, contains a floccant to remove via settling, silt and other debris in turbid water.

It's worth repeating - Following label directions is vial for correct treatment.

How do I safely use *unscented* bleach (sodium hypochlorite)?

For products with 4% to 6% of chlorine by volume, the EPA recommends treating water by putting the water in a clean container and adding 8 drops (1/8 teaspoon) of bleach for every gallon of water.

Stir as you add the bleach and then let the water stand for *at least* 30 minutes. If after 30 minutes, the water does not have a residual smell of bleach, repeat the dosage of 8 drops per gallon and let it sit for another 15 minutes. If no smell is present, discard the water. For smaller containers, use 4 drops per 2 liter soda bottle or 2 drops for a 1 liter bottle, but only if the water is clear.

How do I use my iodine tablets?

First, was the container holding the tablets sealed and within the expiration date? If not, *discard the tablets*.

If the bottle is open and was opened more than three months ago, *discard the tablets*.

If the bottle is sealed *and* within the expiration period, follow label directions for use. As noted above, iodine is not completely effective on certain protozoa. Iodine used in conjunction with an appropriate filter can render the water safe to drink. See the filter section for a discussion of filter pore size.

(Iodine is no longer sold in the EU for water treatment, pure iodine crystals have been banned in the U.S.)

What is calcium hypochlorite?
Calcium hypochlorite is a dry chemical sold for pool water treatment. It can be found in most 'big box stores' and stores that sell pool supplies.
Read the Material Safety Data Sheet (MSDS) BEFORE you purchase or store this dry chemical.
Calcium hypochlorite is a strong oxidizer, it *will* cause corrosion of metal. It is an "energetic reactor" which is to say, mixing with any number of materials will cause a reaction, usually violent. It will also burn if the storage container is set alight.
While the material is, by its very nature quite dangerous, it does offer some benefits. First, it offers a longer shelf life than other common water treatment chemicals. Second, simply put, is density. For the same storage space, it will treat more water per volume than other choices. Last, for what it does, the price is reasonable.

How do I use calcium hypochlorite to make waster safe to drink?
The US EPA guidelines are --
(http://water.epa.gov/aboutow/ogwdw/upload/2006_09_14_faq_fs_emergency-disinfection-drinkingwater-2006.pdf)
Add and dissolve one heaping teaspoon of high-test granular calcium hypochlorite (approximately ¼ ounce) for each two gallons of water, or 5 milliliters (approximately 7 grams) per 7.5 liters of water.
This mixture will produce a stock chlorine solution of approximately 500 milligrams per liter, since the calcium hypochlorite has available chlorine equal to 70 percent of its weight. **This is now the solution you will use to treat your water**.

To disinfect water, add the chlorine solution in the ratio of one part of chlorine solution to each 100 parts of water to be treated.
This is roughly equal to adding 1 pint (16 ounces) of stock chlorine to each 12.5 gallons of water or (approximately ½ liter to 50 liters of water) to be disinfected. To remove any objectionable chlorine odor, aerate the disinfected water by pouring it back and forth from one clean container to another.
If you choose to store and use this chemical, please obtain *accurate* measurement devices.

Okay, I'll just boil my water, how long do I need to boil it?
Bringing water to a boil (large bubbles roiling from bottom of container) and holding that boil for at least one minute, then allowing the water to cool is one method to ensure the water is safe to drink. Boiling kills both protozoa, like Giardia lamblia and cryptosporidium (Phylum Apicomplexa) as well as viruses that pose a heath risk. Boiling DOES NOT remove other contaminates, such as pesticides, hydrocarbons or antifreeze. Ensure your source is free of these types of contaminates before treatment by boiling.

I want to buy a filter, which one is the best? How can I tell what product is a filter and what device is a purifier?

There are many filters on the market. Generally, the price varies on how fine or small a contaminant the product will filter from the water. This is called pore size - generally, the smaller the pore size, the more expensive the product.
First, let's look at the difference between a backpacking water filter and a backpacking water purifier. Then I'll explain why you might opt for buying one over another. I say backpacking due to size differences in other filter systems.

Putting it in the simplest terms, a water **filter** removes protozoa and parasites, perhaps even some bacteria, but it *does not remove viruses*. This ability to filter is, again, a function of the filter pore size. It's that "micron" thing you see in the ads. *These filters **must** be used with chemical treatment to provide safe water.*
A water **purifier** eliminates all of these biological contaminates, plus viruses. In fact, the Environmental Protection Agency has set standards that require water purifiers to eliminate a percentage of all viruses. IF the device is a purifier, it will normally be registered with the EPA.

Chemical contaminants are another story and there is no easy or sure way to remove them. Carbon block filters do a good job of *reducing* rather than removing chemicals from the water, but cleaning up the horror of urban water is not gong to be done by a simple, handheld 'filter'. As with many things in life, you get what you pay for - a cheap filter will provide water that may not be safe to drink.

Let's spend a bit more time on this. Advertisements spend a lot of time on the whole 'log' thing - so what does it mean?
There are two different EPA classification standards for water treatment devices.
The first classification is for a water filter, meeting this standard requires a water treatment device to demonstrate removal of at least 99.99% of pathogenic agents / bacteria. This is known in the water filter industry as a log 4 reduction.
The most common pathogenic organism cited in filtering ads?
- E-Coli
- Giardia
- Cryptosporidium

A filter does nothing about viruses in the water.

The second classification is a water purifier. To meet this standard, a water treatment device must remove at least 99.9999% of pathogenic bacteria (log 6 reduction). In addition the water purifier must be capable of reducing viruses by at least 99.999% (log 5 reduction).
Given that viruses are generally measured in fractions of a micron, that's quite a feat. We are talking *very small* here -
-viruses (0.01 microns);
-bacteria (0.1 micron) and
-protozoa (1 micron).
Most purifiers use an internal carbon block filter with iodine or silver embedded in some kind of matrix. Others actually have pore sizes on the 0.1 to 0.02 micron range. Expect to pay more for these higher quality products.

Someone told me I need to pre-filter my water. Why is that?
Pre-filtering is a good idea. If your water is turbid (cloudy or muddy), you really should pre-filter. You can run your water through a bandana, a coffee filter or even your old socks to remove the mud, leaves, plant matter, bugs and debris often found in even running water. Silt and mud in the water requires additional chemical treatment and the suspended matter will quickly clog a good quality filter. So, taking the time to pre-filter your water will yield best results and extend the service life of your filter/purifier.
Mud and silt may also be removed through floccation; that is - adding a chemical that causes the material to clump and sink to the bottom of the container

I hear I can use the sun to purify my water - is that true?"
Yes, you can use the sun. Called SODIS for SOlar water DISinfection. Simply place your non-turbid water in clear PET bottles out in the full sun for at least 6 hours. The solar UV radiation and heat will kill pathogenic agents in the water. This is best done in the southern tier U.S. - where the sun's UV rays are not as attenuated by the atmosphere, clouds or a low radiation angle.

What about the UV light pens - are they any good?
There are several products that generate UV light to purify clear water. I don't recommend them solely because of the need for batteries.

How do I best transport my water?
Water weighs eight pounds per gallon. Any clean contain may be used, but give consideration to weight and ease of handling. I usually recommend the common one or two liter soda bottle as it is both very inexpensive and rugged. There are carriers made to transport the bottles that may be obtained for the asking. Old style military canteens, sport drink bottles and iced tea bottles are all examples of good storage containers. Gallon, two and a half or five gallon water containers found in the grocery store make poor containers as they quickly become brittle and may leak at the seams. Purpose built containers, like the WaterCube boxed water or the Reliance brand Cube containers are good examples of the many products on the market today.

Capstone project items -
- Containers for up to four gallons of water (One gallon if you have access to water)
- Water treatment tablets
- Filtering system, both pre-filter and primary filter.

Expense items:
24 Chlorine dioxide tablets $10.00
Soda bottles $0.00
1 gallon ZippLock storage bag $0.20 (x 2)
Bandana and coffee filters $0.00 I'll call these found items)

Possible filter option -

Sawyer Squeeze - filters out down to 0.1 microns. Water will still need treatment for possible virus contamination. Attaches to common 20mm bottle - most soda and water bottles have a 20mm neck.

Chapter Two
Shelter and Environmental protection

"Singing in the rain, I'm just signing in the rain" Fred Astair

Just like the popular song, rainy days and Mondays always get me down. Well, Mondays, those I can live through, but too much time spent in the rain could kill you. Shelter is the next most important item on your list, right after water, because it really is a cold, cruel world and unprotected exposure to the elements can and will kill you.
I think everyone reading this understands that there is a range of temperatures, narrow as it is, within which you can easily function. Go outside of that narrow range of temperature and you are now uncomfortable. Deviate further and fairly soon you are dead. That deviation can be hot or cold - either extreme can do you in.

Your body temperature can change through four main external processes. These processes are radiation, convection, conduction and evaporation.
Radiation can be described as the heat felt from the sun or the heat from a campfire, both are forms of infrared radiation. Your body radiates heat all of the time as well.
Convection is the loss of heat from the movement of air or water across your body or the exposed parts of your body.
Conduction is the loss of heat from physical contact with a material or object that is colder or warmer than your body.
Finally, evaporation is heat loss from moisture changing state (water to vapor), resulting in a heat loss.

Let's begin with heat, or rather, too much of it. You can be heated by direct exposure or by indirect exposure. To avoid direct exposure, you would seek shade. In some areas of the world; you'll have to make your own shade. Indirect exposure is the heat received by radiation from other objects, say from nearby rocks that have been exposed to the sun, or from a hot wind blowing directly on you. Failure to react to excessive heat can lead to heat exhaustion, heat stroke and hyperthermia - all of which are emergent conditions leading to death.
Your body naturally reacts to excessive heat by sweating. The sweat evaporating will remove heat from your body. Fan yourself, and convection will help cool you. Take a dunk in a cool stream of water and again, convection removes the excess heat. Sit on a nice cool, moss covered rock and conduction will pull the heat from your body. A shade shelter can provide protection from direct radiation and from a hot wind to reduce heating from convection.
Cold will kill as fast as the heat. Hypothermia, once commonly called exposure, is where the body can no longer maintain a livable internal core temperature, and death soon follows. A shelter will reduce exposure to wind, rain and snow to help you maintain your core body temperature.

So what is shelter - really?
I like to think of 'shelter' as a series of shells or layers, that I can add or remove based on the conditions at the time. These shells should be easy to add or remove, wick moisture away from your body and provide insulation between the environment and your body.

Base layers:
I found (brand) cotton long johns on sale, should I buy some?
I generally do not recommend cotton long underwear except in a limited number of specific situations, such for wear under Nomex fire-proof clothing. Polypropylene (Polypro) based clothing offers many advantages. Polypro is generally moisture wicking, fast drying, lightweight and so on.
NOTE - If you work in a hazardous environment, check with your safety people on restrictions for both nylon or polypro garments.

I found some (polyester-lycra fabric) brand long johns, should I buy some?
If the garment fits, by all means. But you are really looking at underwear, rather than classic 'long johns' or insulating garments. Many of these undergarments offer moisture wicking and odor control, so represent a good base layer for your 'shelter'

I was at the store and saw polypro long johns, some were fuzzy inside, the others looked like they had lines or ridges - what's up with that?
Both types allow a layer of air to be trapped against your skin. This air space is heated, and so you feel 'warmer'. Both styles work well, so cost or fit should be bigger factors than style.

My fiend told me that a long sleeve shirt is cooler than a short sleeve shirt, how can that be?
Your friend may just be right. A loose fitting, long sleeve shirt will protect you from direct solar radiation and can feel cooler. You'll also benefit from reduced exposure to UV rays, which can burn and in the long term, have been blamed for certain skin cancers.

Outer layer:
Outer clothing is the next layer in your shelter. This next layer is shirt and trousers, then coat, hat and gloves. For a disaster kit, you'll want heavy duty clothing that is easy to clean and can stand extended wear. Location will drive what materials the clothes are constructed of. That is, light weight in light colors for warm weather, heavy wool or treated canvas for cold weather. Used 'work' clothing obtained from a local thrift store will allow you to purchase clothes inexpensively enough to leave the garments in your disaster kit.
You can take a lesson from the 'homeless' who live outside all day, nearly everyday. They will often wear two sets of trousers, multiple shirts and often more than one hat. There are many reasons that different people have for this 'fashion', but the idea of having multiple layers shouldn't be lost on you. When it gets cold at night another pair of pants, or even nylon shell pants can make a real difference. Another is a regular shirt and pants covered by overalls or bib overalls. This combination is much warmer and

provides some protection should you need to perform tasks that could tear your primary outer layer.
I leave a set of oversized Carhart brand overalls and an oversized lined jacket in my car all the time. If forced to change a tire in bad weather, I'll have a way to cover my street clothes and the outfit will keep me much warmer.
This does raise the question of just how much in the way of clothing should you keep in your disaster kit. Since this document has a focus on a four day kit, the real answer is - none, or nearly so. A complete change of clothing takes up space, bulks up your carry package and adds weight. On the other hand, standing around at night in rain soaked clothing can kill you.
My compromise is a single set of underclothes, a set polypro long johns, and a set of nylon pants and jacket. In mild weather the nylon outfit should be enough to wear as you dry your things. In colder weather, the long johns worn under the nylon shells should be fine for most use. If you get soaked in extreme cold weather, it's problematic that you would be able to change into a dry set of clothes before hypothermia sets in. The polypro outfit will be your sleeping outfit in any case, this to maximize the warmth of your sleeping arrangements.
One last thought on the outer layer. The clothing you select should be rugged, heavy duty you might say. If you work in a suit, a dress or light weight clothing, you might want to consider having a complete change of clothing that stays at your work location. If a disaster event occurs, you can change before you leave, the few extra minutes spent will likely be paid back many times over. Don't forget a pair of good quality walking shoes or boots and an extra pair of good quality wool socks for your change-into outfit.

<u>I just found (brand name) of overalls on sale at the thrift store, should I but a set?</u>
You should first do a bit of research on the price of new heavy duty clothing. You may be surprised at how well they hold their value. A set of brand name 12 oz cotton duck overalls can cost 75 dollars or more, here in Alaska. Used, but serviceable overalls of the same brand may sell used for 50 dollars or more. In some cases, you may be better served by purchase of new items, rather than used. You should at least know the price of new before you hit the second hand/thrift stores.
I took a recent (2/2013) trip to Tucson and while there, hit several used clothing stores. I was able to purchase four sets of heavy duty pants for $10.00 - total. Two pair were as new, store tags still attached. It pays to shop around.

<u>My goodness, I found a used Filson jacket and they wanted...a lot!</u>
Some garments are *legend*ary. Filson is one of those, along with Pendleton and few others. These are clearly a case of actually getting what you pay for. You may find a bargain in a used clothes / thrift store, but I doubt it. On the other hand, I have seen Filson jackets worn daily by the *grandson* of the original purchaser.

<u>Are these Army surplus wool shirts any good?</u>
The surplus 'OG' wool shirts and so-called field pants, if *true* US surplus - are rugged garments. If they fit, or are even a bit loose, and the price is right, they represent a solid value for outerwear. Regular fatigue uniforms (OD, ACU and MARPAT) are both

expensive and may not wear as well as clothing sold for industrial workers. In these, price should be the deciding factor. Please note - military 'style' does not equal true military surplus quality.

What should I watch out for in used clothing?

Before you purchase *any* used clothing, inspect it completely. Are all the buttons and zippers whole and functional? Are repairs needed? If there are tears or rips, you can mend the garment yourself, but the price should reflect the lower value found in clothing in need of repair. Carefully check all the pockets, turning them inside out. Check seams and hems, again, carefully. Finally, check for fit. Used garments rarely are the size they are tagged at; if a fitting room is available, use it. At a good price point, used clothing can make a good addition to your disaster kit.

Protective layer:

A protective layer includes ponchos, rain suits and heavy jackets like parkas or anoraks. I have some fairly strong ideas of what works in the field. Why? My opinions are based on experience.

Before entering the military, I worked my college summers with a Geoexploration field crew in the Western US. In the military, I've worked in the field out from the remote Nevada desert to the wilds of Alaska, both winter and summer. Finally, I now live full time in Alaska.

Let me begin with fit. A proper rain suit will have a long jacket and bib type overalls, with the jacket extending down to the level of your fingertips when they are fully extended. The jacket should be vented, with a two-way zipper if possible. The jacket should have a hood - with visor, if possible, and a drawstring at the waist and hem for when the wind comes up. If you are going to spend real time working or even walking in the rain, you owe yourself a quality rain suit.

A poncho should have a hood and extend to at least your knees. A set of lightweight nylon gaiters covering your shoes or boots and extending all the way to the knee will go a long way to keeping you happy in the wet. One common problem with a poncho is that the wind can make it difficult to stay dry, so include a length of cord or a belt to secure the poncho at your waist on a blustery day.

A parka or cold weather jacket should be part of your outfit. Leave it in your vehicle if you don't care to wear it inside. The parka should fit such that the bottom hem is the length of your extended fingertips, or slightly longer. In other words, it should cover your backside. The parka should, at a minimum, have a waist level drawstring to keep the wind out of your core area. If the garment also has a hem level drawstring, that's even better. I prefer a parka with both 'hand pockets', and larger cargo patch pockets. I leave several hand warmer packets in both sets of pockets year around. You never know when you'll cold hands after all.

A friend told me that cloth parkas were worthless. Is he right?

I've worn military and commercial parkas made from both cloth and nylon. The USAF issues both types; I've used both while active duty. While out in the field, if I'm going to be around a campfire, I wear a cloth shelled parka. On the other hand, my anorak is coated nylon, and I wouldn't have it any other way. The main thing I worry over is

damage in the field and ease of repair. Cloth is less likely to burn, and I find that sewing cloth is easier.

Well then, when would I want a nylon parka?
That's a very good question. A nylon shelled parka is normally lighter in weight than a cloth one and a nylon parka usually does better in a wet environment, where cloth does not. Both, if well made, seem about equal.
I walked around the Cape Lisburne Long Range RADAR site one winter in 30+ knot winds and temps reputed to be nearly -50F. I was properly layered, with my outer layer being a set comprised of a cloth parka and so-called fat boy pants. I wore the issue arctic mittens, to protect my hands. I still have all my body parts, though I do have a better appreciation for what Scott must have gone through at the South Pole.

I can wear sandals in the desert, what is the best boot for cold weather?"
I would suggest boots or shoes are a better choice for desert wear. Sandals are fine for hot weather casual wear in town, but are a very bad choice away from the city or roadway. Sandals are always a bad choice in a disaster where debris or other items can injure your feet.
The type of cold weather boots you choose is dependant on the location. For cold and wet weather, a pair of good overshoes and your normal boots with wool socks may be just the thing. Another choice is the so-called Caribou pacs. A felt lined half-boot with a rubber bottom and leather upper. I love mine and with a new set of liners, it like getting a new boot for very little money.
In extreme cold weather *and* in a dry area, you can wear so-called Bunny Boots or Mukluks. A Bunny boot, or as it's known by the military, "Boot, Extreme Cold Weather, Vapor Barrier" - is sometimes called a VB boot. Basically a rubber boot within a rubber boot, with felt insulation between the inner and outer shells, they have a valve at the ankle to allow for pressure differences.
These VB boots must be worn correctly or their use can lead to Trench Foot, a permanent partial disabling condition. If wearing VB boots you must change your socks at least every four hours, and dry your feet completely at each change of socks.
Mukluks are usually found as a cloth or nylon shell covering thick wool booties, with one or more wool pads for extra insulation for the bottom of your feet. The sole is a rubber-like compound with an aggressive tread patter. They are a dry-climate garment only! They offer no real support, so are not very fun if you have to walk any distance with a load. If you decide to purchase surplus mukluks, treat the shell with an appropriate water-proofing compound. Canadian surplus mukluks are built very differently than the US version. Mukluks will keep your feet warm well below zero F. I have worn mine in colder weather but I have modified them with calf length urethane liners in addition to the felt pads and booties.
A good set of 'snow machine' boots will work well but are normally difficult to walk in for any distance, something to consider for any boot.

What about hats and gloves?

I strongly suggest you have a hat with built in ear flaps, as you ears are very easy to freeze and horribly painful once thawed. A good wool knit hat over a 'baseball' style hat will work well, the bill working to keep rain/snow out of your face.
Full face head coverings, a baklava or knit hat with a separate face covering are essential for extreme cold weather.
Fleece material is as warm as wool when dry, but once it becomes damp, ceases to provide real insulation / protection. A thin knit polypropylene cap covered by a second wool cap can provide an opportunity to dry one should the inner polypro garment get soaked in sweat. I wear a poly under and wool over baklava set in very cold weather.
Gloves are a personal preference. I carry several kinds, wool liners for use with leather work gloves, something I recommend. I also carry some light neoprene gloves. If you will be in a wet environment, PVC coated gloves with wool liners provide both warmth and protection.
You should have one pair of gloves for 'work' like cutting wood, working with rope, moving a hot pot from the campfire - made of heavy leather, these are primarily for protection. A second set for warmth can fit in a pocket with no difficultly. I use wool liners as my secondary set. These gloves are inexpensive, lightweight and warm.

Now we've discussed a shell around your person, what is the next layer? In this case, I'll cover use of a tarp. The Capstone project uses a 8x10 blue poly tarp, and recently, my local big box store had a pair of the 6x9 blue tarps on sale for five dollars. The tarp used to photograph the capstone project is 8 x 10 feet. Since this tome is aimed at an individual kit, you may chose that size best suits your needs. The smallest usable tarp is the 6 x 8 foot model.

How can I best pitch a tarp?
That depends on your location, the weather and a host of other specific issues beyond this document. If it helps, I gave my eight year old granddaughter and her younger brother a few large nails, for tent pegs, and a blue tarp. Each had a walking stick to use if they wanted, and a tree was nearby if that was desired for use.
In less than twenty minutes, they each had a workable shelter set up; both used their 'walking sticks' to hold up the shelter. My assistance was limited to tying the knots in the string used to hold up their shelters. Check the tarp sidebar for images.

What do I need to pitch my tarp?
A popular type of cordage is known as '550 cord'. Also called 'paracord' or 'shroud line' all refer to a nylon cordage used to connect parachute canopies to a harness. This cordage may be purchased in bulk. It is handy to work with, but ordinary mason's line (nylon) is more than strong enough to do the job and it comes in colored rolls. Another inexpensive option is the white polypropylene so-called "tomato twine" - a roll of 6,500 feet sells for under 35 dollars. At 350 pounds breaking strength, I find this twine has worked well for me over the years and at very low cost.
Pegs to secure the edge of your tarp may be made locally, or you can purchase a few large nails and leave them in the Yukon ruck you will be building.

Are these blue traps safe?"

These tarps are flammable. DO NOT cook directly under a tarp with an open campfire - the sparks could ignite the fabric.

Are these tarps waterproof?
Nothing foldable is truly "waterproof". Shelter is just really shades of water resistant. If you rub the inside of a tarp, water may leak through. This leaking happens with several materials, including canvas and other common tent materials. I have found that vinyl coated tarps are heavy duty, weather well, but are expensive and heavy. Since the focus here is on low-cost, I've used the common blue poly tarp, since it will be used as the 'backpack' as well.

What else can I use besides the blue tarp?
Let your imagination go! The idea behind the blue tarp is that is low-cost, already has grommet protected tie points, and is almost universally available in North America. Nylon shower curtains, painter's drop cloths, even old sheets can be treated to repel water. There are several things you must consider as you make your choice.
-Is the material flammable?
-Is the material durable?
-Does the material have a place to attach a cord or line?
-Is the material suitable for my location?
Some people I know carry large squares of Visqueen, a type of heavy plastic. Transparent, is can provide a workable 'side' to a shelter and lets in the light as a bonus. Sheets of Tyvek is also a popular material to use as a tarp shelter. I normally carry a square of 8 mil black 'construction' plastic sheeting for a ground cloth.

How about one of those military surplus 'pup' tents? I've seen them on line for eight dollars... Are they any good?
Yes, you have. You'll need two of the "shelter half" units to make a tent. Ensure they are free of holes and have the pole set that should come with the unit.
Are they any good? In looking, I see where a complete 'double ended' system, (both halves) poles and pegs may be had for under 30 dollars. A complete shelter (two halves, poles and pegs) weighs in at just about six pounds. A 10 x 12 foot poly tarp weighs in 2 pounds, 10 oz.
I have three shelter halves, they are fun for the grandkids to play in, and can be rigged as a Baker style tent, but for this project, I would recommend against them - just too limiting.

I see where two military ponchos can be used for a shelter, is that a good choice?
Certainly, the military designed the poncho to do just that. But, let me ask you a question, if you are wearing your poncho because it is raining, how do you set up a shelter?
I won't kid you, for years, in the desert I carried a poncho and poncho liner as a sort of sleeping bag where weight was at a premium. I also froze my backside off. I could grab a catnap if I was lucky. The poncho liner was barely better than lying out without any cover, just barely better. Nowadays, the Military Sleep System provides more options

than I had at the time. But these, even surplus, are very pricy. This brings up the question -

What will I use for a sleeping bag?

For this kit, a surplus 100% wool blanket is used as a sleeping cover. A used, five+ pound, quality, military surplus blanket will go for about 20 to 40 dollars for the 100% wool items.

This is one of the expensive items for the kit. It is money well spent. Wool will retain the ability to keep you warm, even if damp. Wool will not burn if a spark from your campfire lands on the blanket. If you live where it is very cold at night, then a second layer (a square of polypropylene material) can be added. I've purchased the polypro material for this second layer at a local fabric shop for under eight dollars. Polypro or Fleece blankets can often be found at bargain prices, these, coupled with a wool blanket are hard to beat.

If you live in a warmer climate, say, Southern Arizona - a fleece sleeping bag 'liner' can be had at the local box store for under 20 dollars. They are a nice item as normally they have a zipper and a small stuff sack to carry the liner.

For this project, I am using a 5.4 pound, surplus 100% wool blanket with a poly throw. Remember, I discussed earlier about having a set of polypro long johns to wear to bed as well. With your knit hat and gloves, a set of dry socks, you should be set in temperatures to freezing and maybe a bit lower.

A wool blanket is all I need?

Almost.

I'll have you add two so-called drum liners or contractor trash bags plus a windshield reflector. (see sidebar). The trash bags are heavy weight plastic and may be used as is, or split for more protected area, serving as your ground cover. The windshield protector is made of the reflective bubble type insulation. Found in rolls at your local building supply store, the brand I've most often found is "Reflextix" brand insulation. It looks for all the world just like foil coated bubble wrap. These windshield protectors can be found at garage sales (I got mine for 25c), your local big box store or on line - look around.

You are kidding, right? Trash bags and a windshield reflector?

I'm not kidding. I'm going for cheap here.

I've slept in a cardboard box, with the reflective insulation and a military ground roll under me. Wearing my polypro long johns, heavy socks and wool beenie, I slept under a single wool blanket in zero degree weather. Slept pretty well, as a matter of fact. I wouldn't recommend this for folks without a lot of experience, but it is do-able. I have a stub on this at the end of the book.

The key for comfort, or at least to be able to sleep is to have as much *or more* insulation *under* you as on top. Place the trash bags first, filled with duff (leaves and dry grass) if possible, then the windshield reflector, you on top of that stack, with the blanket on top of you. Even if you use a sleeping bag, the insulation under your bag is as important, if not more important, than what is on top of you. It's that whole conduction vs convection thing we covered at the start.

Other items, like ribbed cardboard, will work as ground insulation.

This is another reason to try out your kit, before there is a need, even if you just camp out in your back yard.

I have covered the various layers, or shells used to surround you for protection from the environment. I mentioned leaving heavy duty clothing at work in case of a disaster event while you are working. I specifically called for a hat and gloves to go with an extra pair of warm wool socks for your kit. Finally, I covered tarps as a good way to provide shelter for your blanket 'sleeping bag' and plastic bag ground cover.

Items seen in Capstone project images -
Tarp, blue, 8 x 10
Blanket, 100% wool *5.5 pound surplus blanket)
Long John, polypro, 1 set
Nylon wind suit - 1 set
Ground cover - trash bags and windshield sunscreen
(Not seen - cap, gloves, wool socks)

Expense items:

Blue tarp	Varies on location - about $10.00
Polypro long johns, available as surplus	$5.00
Blanket, 100% wool. Varies by location, call it	$25.00 to $40.00
Ground cover, varies, call it at	$2.00

Chapter Three
Fire and Light

"Come on, Baby, light my fire" The Doors

If outdoors, you will need a source of heat to avoid hypothermia, cook food and provide light to perform any work after dark. Here, I'll discuss a variety of inexpensive stoves, and show you how to make a pair of stoves that burn a common commercial product. I walk you through different choices in flashlights, lanterns, and candle lanterns. The last part of this chapter is a discussion on the advantages and disadvantages of a campfire. One need only look at the poor souls wandering the streets of their ruined cities after a natural calamity for motivation to have a small kit ready at hand to provide some basics. After all, a public shelter may not be available for some time. Cooking food and boiling water quickly becomes a primary consideration after a disaster.

I want to discuss stoves first. While it is possible to build a campfire, which I discuss last, a stove provides many advantages. A small stove is easy to light, provides controlled heat, works in nearly any weather condition and most can be shut off when you are done cooking or boiling your water. A stove suitable for you kit should be small, lightweight, produce enough heat to boil water in a reasonable amount of time and use commonly available fuel. *The fuel must be safe to store for up to a year in the kit.*

For this DIY kit, I will first recommend a Sterno brand folding stove. It folds flat, will easily support a large pot and is easy to light and snuff. Because it burns gelled alcohol, may be used safely indoors with minimal care taken for ventilation. One large (7 oz) can of fuel is rated by the vendor to burn for two hours. The small can (2.6 oz) burns for 45 minutes. At ten minutes to boil two cups of water indoors, you should be able to produce (about) 24 cups of hot water before the first can is used up.
The shelf life of this canned fuel is phenomenal. Years ago, a friend gave me a can of Sterno fuel dated 1947 - I've burned it several times since to demonstrate that properly stored, the shelf life of this product is outstanding.

Another good choice for cooking is a Trangia brand alcohol stove (burner). Heat output is the same or slightly hotter than the Sterno brand product. The Trangia burner may be used with the Sterno stove as shown above. Trangia sells engineered cook kits incorporating the burner, but these can be costly to buy as a system.
Alcohol burners are safe to use indoors with proper ventilation, the only caution I have is that alcohol burns with an almost invisible blue flame. A fuel spill is a concern, the alcohol may still be burning, yet the flame unseen. If any fuel is spilled, absent an ignition source, it will evaporate quickly and leave no residue or offensive order. Fuel may be obtained at the local gas station in the form of the yellow bottle of HEET brand fuel antifreeze. Alcohol sold as a paint thinner is also a good stove fuel.

There are numerous camping stoves that are compact and provide excellent heat. I would suggest that other than so-called canister (propane/Butane) stoves, none are really suitable for safe indoor use. The cost of the fuel canisters is also a consideration. Another strike against these compact camping stoves is their stability, or lack thereof. You must be quite careful to avoid tipping over your cooking pot.
Storage of volatile petroleum fuels like gasoline or kerosene is another major drawback - for this kit.
Having said that, larger or full sized 'camping' stoves, propane fired, may be a good item for use at home in the event of a loss of utilities. The venerable Coleman brand stove may be had as a propane appliance or an adapter is available to convert a Coleman brand gasoline stove to propane use. The adapter may be sourced from more than one vendor less than twenty dollars! Proper ventilation must always be a consideration when using these larger stoves indoors.

Tin can stove
Don't want to spend money on a stove that will sit in a kit unused? Okay, a Sterno folding stove does sell for 5 to 9 US dollars, the fuel, about four US dollars for a large can. Any food can of a diameter large enough to hold the fuel container may be pressed into service as a pot holder for your fuel. (See photo at end of document)
The holes in the sides were made with a common can opener, the cooking cup is held by two short sections of coat hanger wire. The holes for the wires were made with a small drill bit.
The only critical measurement is to ensure the top of the fuel can is 32mm to 38mm (1.25 to 1.5 inches) from the top edge of your pot support. DO NOT use gasoline or kerosene in this or any alcohol stove. This stove can be used with regular pots by setting the fuel can on top of the support wires.

<u>What about these so-called soda pop can stoves? Are they any good?</u>
There are a large number of plans to make an alcohol burner out of soda or beer cans. They work, but are *fragile*. The Trangia brand burner, made from brass, is very rugged, time proven design. You get to chose, it's your money.

<u>Can I use isopropyl alcohol in one of these stoves?</u>
It's also called 'rubbing' alcohol. If the alcohol is 91% - yes. If the alcohol is marked at less than that, usually 70%, then no, it is not really suitable for use in an alcohol burner. Please note that the even the 91% alcohol will smoke and leave residue on the cook pot.

<u>How do I put out the flame on my Sterno fuel?</u>
Simply place the lid back on the can, loosely, and the flame will extinguish. Once the can of fuel cools, press the lid firmly in place.
On a Trangia burner, the so-called simmer ring is used to snuff the stove.

<u>What other kinds of fuel can I use with my alcohol setup?</u>
There are other brands of 'chafing dish' fuel, read the labels carefully. All are alcohol based. Other alcohol sources, like yellow bottle HEET fuel-line antifreeze burn cleanly

as well. Remember, extra ventilation is needed for any indoor use. NEVER use anything other than alcohol in an alcohol burner.

Campfires -

I'll be honest; I'm not a fan of an open fire for use in a disaster situation. They're a potential source of out of control fires, burns and can produce noxious smoke. Cooking over an open fire is a skill, so if you plan to go this route, some prior practice is strongly suggested.

An open fire will produce both heat and light. And smoke, lots of smoke. A campfire requires an open space, with nothing flammable overhead for safety, and a significant source of fuel. People living in an urban area will be hard pressed to find a viable source of dry fuel to maintain an open fire for any length of time. Bad weather, such as rain and/or high winds also impact on your ability to keep any fire going.

IF you live in an area where fuel is plentiful, by all means, plan on using an open fire for your cooking needs. You'll need more than a few strike-anywhere matches for this, especially if your wood is wet. For those in urban areas, remember that some treated wood products will outgas poisonous fumes when burned, so do all of your cooking outdoors, unless your indoor stove is properly vented.

Lighting:

Light in a grid-down situation can be provided by flashlights, lanterns, and candle lanterns.

For short term situations and small size, it's hard to beat the common flashlight. With the newer LED 'bulbs', battery life can be excellent. For your DIY kit, any number of low cost LED flashlights are available, so many that I won't make a specific recommendation. If you already own a MagLight brand flash, retro fitting for LED 'bulbs' is simple, using a drop in replacement. Check the flashlight section of your local Big Box store. I converted my smaller "AA" battery MagLight for just a few dollars.

A headlamp, ("AA" and LED) as part of your kit will allow you to keep your hands free as you perform a variety of tasks. Again, there are so many low cost lights on the market, I'll just say, consider adding a headlamp to your kit.

The only lanterns that I am aware of on the market for possible inclusion in this kit are candle lanterns and a single kerosene insert made for a specific brand of candle lantern. I purchased and have used an older miniature kerosene lantern (also called a canoil) and found it lacking. The kerosene insert has more than a few bad reviews, so I've mentioned these in passing with a recommendation to take a pass on these products. Fuel storage is problematic if nothing else.

Candle lanterns, such as the UCO candle lantern have been around a long time. Well built, they enjoy a following with replacement candles readily available on line. I have used these for years and within the limitations of a candle lantern, they provide a usable light, burning for about eight or nine hours for a single, full size candle. UCO also makes a lantern which uses the popular tea candles. Either would make a good secondary light source for your DIY kit. Since these lanterns keep the candle inside an enclosed space, they are much safer than a candle sitting out on a plate.

Just remember the storage conditions; heat is not kind to candles.

Items for Capstone project -
Sterno stove and two large cans of fuel
Small pot, spoon and a table setting
Several ZipLock bags to use as eating vessels

Expense items:

Stove	under $10.00
2 cans of Sterno fuel	under $10.00
Cookpot	$0.00 (use what you have)
ZippLock 1 Qt bags	$0.20 (x 10)
LED flashlight and 1 set spare batteries	$7 to 10 dollars, depending on brand.

If you use a Trangia burner, substitute 2 bottles of HEET (Yellow bottle) for the Sterno canned fuel - cost is about $8.00

Chapter Four
Nutrition -- Food & cooking)

This segment focuses on putting together your own meals - ready to eat or otherwise. Using commonly available long shelf life commercial products, you can make your own tasty and easy to cook or heat to eat meals. I discuss several common problems with home-made MREs and show you how to avoid some of those problems. Finally, you should store what you eat and eat what you store.

I'm going to focus on the kit storing about four days worth of food for one individual. You should be able to eat most the items without cooking. The items should have a good shelf life, more than 6 months for storing in the kit and be relatively low cost. I'll talk a bit about stoves again, just because you *can* eat something cold, doesn't mean you should eat a cold meal.

Food for your kit must:

- Require no refrigeration,
- Be easy to make and
- Simple to clean up.

The food should also provide *real* calories. In a disaster you'll need anywhere from 2K to 5K calories per day, depending on the weather. Minimal water use is also something you should factor in as well. Too many commercial '72 hour' kits offer nasty 'dry' food that requires cooking and is very low in calories - as in starvation level low calories. Other kits provide lifeboat rations and a few pouches of water. You're not on a lifeboat. Remember, even if you eat nothing, *you will still need at least two liters of water, per person, per day.*

Let's look at some possible choices for your kit food. I'll stick with brands that can be had even here in Alaska, so you should have no problem finding them where you live as well.

Clif Bars - 230 Calories, 30 calories from fat in a single serving bar.

Oatmeal (so-called quick oatmeal, not instant!) 150 Calories per 1/2 cup serving (4 days is only 2 full cups)

Breakfast bar, Quaker Apple crisp - 130 calories, 23 from fat. Single bar.
Breakfast bar, Kashi, Chewy granola, 140 calories, 45 from fat. Single bar
(These run from 90 to 150 calories based on size, brand and so on.)

Nido, dry milk. 160 calories per 8 oz serving, 60 from fat.
This is four tablespoons of dry product.

CoffeeMate dry creamer 15 calories per packet (1 tbsp) shows 1 g of fat

Sugar, per packet 15 calories

Instant potatoes - (Baby Reds) 4 oz pouch - 110 calories (no serving size listed, I'm assuming per oz as it is a carbohydrate)

Minute rice - 250 Calories per 1/2 cup serving per the producer's website
Note - other sources show 150-185 calories per single cup serving of this 'rice'.
Note - With Minute Rice brand rice - 1 cup dry is a 1 cup serving. For unprocessed rice, it is 1/2 cup rice = 1 cup cooked. Unprocessed rice must be cooked to be eaten.

Peanut butter (JIff to go) 250 calories, 150 from fat. per 1.5 oz serving

SPAM (classic, slice in bag) 250 calories per 3 oz serving. (Other choices are tuna in the larger bag, chicken breast in the pouch, and dry salami. See below)

Trail mix (Planters, 6 oz) 150 calories, 80 from fat per 6 oz bag

Lipton Soup (dry) Chicken noodle. 60 calories per packet - makes one cup

Sun Maid raisins 1.5 oz (28g) box 90 calories

StarKist light tuna in water (Pouch, 2.6 oz) 80 calories, 5 calories from fat.

Bumble Bee chicken breast (pouch, 4 oz) about 150 calories

Sailor Boy Pilot bread - 100 calories per cracker

Snickers bar, 250 calories, 110 from fat

Hormel roast beef and gravy (12 oz can) **?** The product label lists servings as "varies' then shows 130 calorie per serving. Lean roast beef is about 46 calories per oz. Call it 500 calories per 12 oz can.

Tasty Bite, Madras Lentils, 150 calories per serving, 50 calories from fat. Sold in retort pouches, two servings to a 10 oz. pouch. Outstanding over rice or noodles. This company also offer noodles and rice in retort pouches.

Fruit, Diced peaches (Dole) 70 calories per 4 oz serving.

Chili, Campbells, 2 cup microwave serving - 220 calories, 50 from fat.

Soup, Campbells, Sirloin burger w/vegies, 2 cup microwave serving - 120 calories, 20 from fat

Soup, Campbells, tomato, 2 cup microwave service - 160 calories, 45 from fat

A Mountain House Beef Stroganoff (2 serving pouch) gives you 500 calories for 4.6 oz.

A single MRE gives (about) 1250 calories and each one weighs in at between 0.8 pounds and 1.8 pounds (depends of menu item and packer) stripping out the internal packing will shave off some weight. The cost of a single MRE is around 8 US dollars as of the time of writing. Current MRE menus offer 24 meal choices. Eat some at home before you decide which ones would go into your kit.

Hormel Dinty Moore Beef stew, DAK premium canned had (16 oz), Corned beef & corned beef hash, and other canned meats may be more to your taste - this is an exercise in counting calories and trying for some balance in your food choices.
In any item you choose to put in your kit, watch out for things like sodium content, most 'backpacking' foods are very high in sodium. Sodium is important if you are in a hot climate and sweat a lot. If you have high blood pressure or are on a low-sodium diet, check the labels before you buy for your kit.

<u>You've listed soup and stews, how do I cook these?</u>

To reduce clean up, wet items can be both heated in a water bath and served in a Ziplock sandwich bag used as a liner. This bag can then be can be held by a bowl or a cardboard ring. Doing this will reduce your clean up tasks. Parboiled rice and oatmeal only need hot water, stews and other canned food may be (carefully) heated in the *opened* can using a water bath, the water being saved for washing up after your meal.

<u>What kind of meals can we make from these basic ingredients?</u>
How about a big hot breakfast of 1 cup of oatmeal (300calories), 1.5 oz of raisins (90 calories) a couple of CoffeeMates in leiu of milk (30 calories) or milk (80 calories) and a packet of sugar (15)" You end up with 470 calories and a pretty filling start to your day. *Requires hot water to be palatable for most people.
*Optional items, Swiss Miss hot coca mix or freeze dried coffee.

You could try a pair of breakfast bars (280 calories), and a full 8 oz glass of milk (160 calories). 440 calories and no cooking needed.

For a lunch? As most folks are habituated to a noonday meal, even if not necessary, why not try a lunch of 6 oz of trail mix (150) + 1 Clif bar (230) consumed thru the day, these will give 380 calories and will keep you going. No cooking required.
*Optional items would be Crystal Delight or other low-cal drink.

Dinner of SPAM slice, diced (250 calories) in a soup mix (60) over 1 cup of Minute rice (500) gives you a full dinner of 820 calories + drink. A 'desert' of a candy bar will add 250 more calories. So, 1070 calories for the day.
"This requires cooking, making a "One Pot meal".

A Cambells microwave Chili (220 calories) over one cup of rice (500 calories) gives you 720 calories, add in a candy bar and you get 970 calories.

These meals are short of the 2000 calories/day we should have, so keep total calories in mind when planning your menu.

Even the roast beef and gravy over 4 oz of potatoes would still leave you a bit short of 2000 calories. You could add a Jif peanut butter packet on a couple of Sailor Boy crackers at mid-day, which would give you an additional 450 calories - meeting the 2K goal per day.

Taking a few minutes to plan now and making a list of items to pick up as part of your regular shopping cycle will help keep costs under control. Since you may or may not know what your group enjoys eating, ask the others in your group before you buy. These are suggestions to follow when planning your disaster kit food menu choices.

Why no MREs? Those are good enough for the Army!
You are correct. Each MRE retails for about 8 dollars, or about 25 dollars a day. You can do better - cost wise. You can certainly plan the evening meal around a single MRE and know you will go to bed with a full tummy and likely have some leftovers to eat the next day.

Canned food? That stuff weighs a ton! Why would you suggest canned food?
This is a DIY disaster kit, not something you would use for crossing the high Sierras on foot. Canned food makes sense if you will be traveling by automobile - I'm sure most of us would prefer that over walking. Canned food (also called wet pack) normally doesn't require additional water to cook, is normally part of everyone's diet and are lower cost than MREs or freeze dry foods.

Why would I pick an MRE over a nice freeze dried meal?
Rarely is a back-packer 'meal' a full meal, normally FD food is sold as an 'entree'. A popular brand of FD food, like Beef Stroganoff, is lightweight and tasty. Add two cups of boiling water and you have -- a bit over two cups of beef stroganoff. You gain a mere 500 calories.
With a single MRE, you get a lot more - for a couple of dollars above the cost of that freeze dried entree, if that much more. Open that funky brown plastic bag and you'll find:

Entree - the main course, such as meatloaf
Side dish - lots of choices here, rice, corn, fruit, or mashed potatoes, etc. These are available separately of you wish to build your own custom menus.
Cracker or Bread choice - tortillas even!
Spread - peanut butter, jelly, or cheese spread. Yum.
Dessert - a cake or cookie choice.
Candy - normally a commercial product, in some cases, not even repackaged.
Beverages - coffee, tea, sport drinks and so on.

Hot sauce or seasoning are found in some menu choices
Flameless Ration Heater - if you don't have a stove or don't want the hassle of a stove, these work pretty well, with MRE packaged items.
Accessories - spoon, matches, creamer, sugar, salt, chewing gum, toilet paper, etc.

I was in the store and saw some "Heater Meals". Are they any good for this?
Good question.
Pros - These and so-called microwave pacs are lighter than canned food, these wet pack items can be readily heated in a hot water bath. The Heater Meal brand has something like the MRE flameless ration heater to warm the meal. I have regularly eaten several different menu choices as lunch while working in Cubeville. Most are decent tasting - but I will caution you to try *any* of your choices first to avoid any ugly surprises later.
Cons - These are not as rugged as canned food. You *must* be careful on how you pack and carry these, least you open your disaster kit and find it full of spaghetti and meatballs. The same caution applies to the peel-top cans as well.

How about those sandwiches from the new First Strike Ration?
I was a bit excited when they first came out at the backpacking stores here. The reality was less than thrilling. They are long on bread, short on filler. At four or more dollars, *per sandwich*, I find them pricy. That said, I still have some in my bag because you can eat them cold - ugh. I sit mine on top of the canteen cup as I boil up water for a cuppa. Warmed up they are something of a comfort food and require no real effort to prepare.

I don't think I could eat a whole can of...say, chili. What can I do?
There are a host of smaller, 'lunch-sized' items in peel-top cans which, when heated and poured over rice, potatoes or pasta make a good, filling and hot meal. There are a host of 'microwave meals' that offer additional choices that are about half the size of a #303 can.

I don't like the taste of parboiled rice. I don't want to carry the fuel needed to boil the water for 20 minutes to make real rice. Any suggestions?
I hate to make those kinds of choices as well. I carry a wide mouth thermal flask and use it to cook 'real rice' and real oatmeal, for that matter. It's also great for heating water the night before to make a hot breakfast without fussing with a stove in the morning. Check out any number of "Thermos cooking" websites for more ideas. For this - practice makes perfect...so practice before you need the cooked food.
Don't forget that multiple vendors offer rice and noodles in retort pouched that are tasty and easy to heat.

What else will work for breakfast? It's a big deal for the start of my day.
There are several dry mix products that will allow you to cook pancakes, grits, bannock (AKA fry bread or pan bread) - or you can roll your own and store the ingredients in a zipbag or plastic container. Ensure your fuel budget covers the extra cooking time and that you have enough water for both cooking and cleaning up.

I dunno, this all looks pretty complicated.

Good point, if you eat out all the time or your meals are mostly fast food, canned food or made for you, this can seem intimidating. In that case, the MREs are your friend. If you have even basic cooking skills, you can mix and match to suit your tastes.
It is really as simple as taking a piece of paper and making a 4 x3 grid - three meals for 4 days, and filling in the blanks.
Add up your calories and estimated fuel use of the item is to be cooked or heated. Remember to check the "Use by" dates on any food before it goes into your DIY kit and make a note of the dates you need to swap out your food supplies.
If you only do one or two practice campout trips a year, you can eat the food before it expires and get to practice your cooking.
If you chose not to camp out, at least cook the food using your kit stove.

I covered stoves in Chapter Three. The choice of your food items will be the big driver in the stove you pick to go in the kit. If you only need to heat some water for the food you have packed, the simple Esbit brand solid fuel stove would be a good choice.
If you plan on doing some real cooking, then the Sterno stove, a quality alcohol burner and some pots and pans are in order. Both Esbit and Trangia make low-er cost alcohol stove cooksets worth a look.
If this is something you plan to leave parked in the closet for a year at a time, then cost should be the major driver in stove selection. I'd hate to have you spend a lot of money on a stove/cookset that might only get used once a year.
Finally, if you go the all MRE route, ensure you get the MRE heaters to go with the food, all of the menu choices are much more palatable when warmed.

Military surplus field mess kit

I had originally planned on my Capstone kit to use a Swedish surplus cook kit only to discover they are no longer available. So I'll suggest a Sterno Emergency Preparedness kit.

Kit includes one portable, folding stove, (4) unscented candles and (2) cans of cooking fuel

- (4) unscented candles provide up to 28 hours of candle light
- (2) 7-ounce cans of Sterno brand cooking fuel for a total of 4 hours of cooking time

You use one of you own pots for cooking.

Chapter Five
First aid and medical

"Baby, you put me stitches..."
The DKR Rockers

Summary -
As a former licensed EMT and having worked (while in the Air Force) as a small unit military medic, the focus here for you should be on ***First Aid training***.

I'll outline a basic First Aid Kit (FAK) and let you know why this basic kit is important. I describe an advanced FAK, one that is layered - so that the supplies you do buy are appropriate and may be inexpensive.

The types of injury you can treat with the FAK are discussed as are the issues related to Over the Counter medicines. While you can build yourself a very nice FAK for less than a commercial offering, *training is one area where you are advised to obtain commercial training.* I've listed sources for hands on training and give you sources on the 'Web for follow-on and self-training.

Every first aid kit begins with *TRAINING!*

I find one of the better training providers here in Alaska is the American Red Cross - a National organization. They are a good first place to check for your training. I'm providing this listing of classes for your convenience. Current information can always be found at www.redcross.org.

Online Blended Learning

The American Red Cross program blends web-based technology with traditional classroom learning. Complete the online tutorial at your pace and the written test online. Then complete your skills session in two hours. all your local office for more information.

Wilderness First Aid - 2 Year Certification

This two-day class consists of hands-on activities about how to respond to emergencies when away from the EMS system. Co-developed by the Boy Scouts of America, students will learn a variety of topics including advanced wound care, head and spinal injuries, shock, environmental illnesses and winter survival. Includes free first aid kit. Wilderness First Aid is valid for two (2) years. Check for current fees.

Adult CPR/AED with First Aid PLUS Child and Infant CPR

The CPR/ AED component of this class includes conscious and unconscious choking, rescue breathing, and CPR for adults, children, and infants, and AED

. CPR/ AED certificate is valid for two (2) years. First Aid includes caring for sudden illnesses, bleeding control, caring for burns, etc. First Aid certificate is valid for two (2) years. Check for current fees

Adult CPR/AED with First Aid
The CPR/ AED component of this class includes conscious and unconscious choking, rescue breathing, and CPR/ AED for adults. CPR/ AED certificate is valid for two (2) years. First Aid includes caring for sudden illnesses, bleeding control, caring for burns, etc. First Aid certificate is valid for two (2) years. Check for current fees.

Standard First Aid
First Aid includes basic care for sudden illness, bleeding control, care for burns, poisoning, allergic reactions, etc. This is the *Minimum training* that should be taken by everyone. First Aid certificate is valid for two (2) years. Check for current fees.

Self-aid and Buddy Care
Military (USAF) first aid training found on-line. http://capnhq.custhelp.com/ci/fattach/get/399/0/filename/afh36-2218v2.pdf

The Red Cross recommends that all first aid kits for a family of four include at least the following:

- First Aid Manual - a must have.
- 2 absorbent compress dressings (5 x 9 inches)
- 25 adhesive bandages (assorted sizes)
- 1 adhesive cloth tape (10 yards x 1 inch)
- 5 antibiotic ointment packets (approximately 1 gram)
- 5 antiseptic wipe packets
- 2 packets of aspirin (81 mg each)
- 1 blanket (space blanket)
- 1 breathing barrier (with one-way valve)
- 1 instant cold compress
- 2 pair of nonlatex gloves (size: large)
- 2 hydrocortisone ointment packets (approximately 1 gram each)
- Scissors
- 1 roller bandage (3 inches wide)
- 1 roller bandage (4 inches wide)
- 5 sterile gauze pads (3 x 3 inches)
- 5 sterile gauze pads (4 x 4 inches)
- Oral thermometer (non-mercury/nonglass)
- 2 triangular bandages
- Tweezers

An excellent First Aid manual I recommend to anyone is the *A Comprehensive Guide to Wilderness and Travel Medicine* by Dr. Eric A. Weiss. is available at no cost on-line. Use the title as a search term.

The most current edition of the printed manual is available from Amazon (new ~$20 and used for under $10) or from Adventure Medical Kits directly.

Alternately, if you have had some training, Army Field Manual FM 8-230 (720 pages, be warned) dated Aug 1984 can be found on line. Note the techniques and data are somewhat dated. Find the manual at:
http://www.webpal.org/SAFE/aaarecovery/7_medicine/Medicine%20-%20Severe/FM%208-230.pdf

The newer 68W Advanced Field Craft: Combat Medic Skills is 602 pages and found on line (some as a free download) at several sites. The Kindle version is $131, but is formatted to work with your Kindle.

Okay, that covers the basics. Now what?

In my experience. many first aid kits seem to have been built with either a limited vision or a lack of foresight regarding their use in a disaster situation. Worse, some kits contain items that if misused or improperly used can further injure a person, permanently cripple, *or even kill the 'patient'*. Hence my emphasis on professional training, it is easily as good an investment as any you'll ever make.

What do I *really* need in my First Aid Kit?

I was fortunate enough to have had the opportunity to receive training from both the military and the EMT community to provide field medical support and to work in military hospital ERs for several years. I was a State licensed and Nationally Registered EMT for many years as well.

Using this field and clinical experience, I have some ideas on First Aid Kits that I think may be of use to you. I'll make suggestions on how to build a multi-layer kit, offer some specific advice on items not normally found in First Aid Kits and the reasoning behind the suggestions.
Finally, I've posted an image of a multi-layered kit, just to you can see what I've been going on about.

DISCLAIMER - I am not a doctor, and I've never played one on television.
Always seek consultation with a medical professional whenever possible.

If you have not been trained on certain procedures, ***do not*** attempt to perform the procedure. You can harm, permanently injure or worse, cause a lifelong disability.

This information is for educational purposes and for discussion.

It will hopefully get you started on your own training program and help you to build a First Aid Kits that will support you, your family or group.

No first aid kit, no matter how advanced, well stocked or massive is ever going to substitute for training.

Concept

The multilayer approach in building a layered kit is focused on supporting you, your family or small affiliated group in a short term abnormal situation. The kit should provide the means for you to provide escalating support for different types of injury and illness found in a situation with limited or no routine medical care access, such is found in disaster areas.

Each kit supports or provides items to be used with the next level kit. Modular in nature, this allows for the medical supplies to be carried by multiple members of a group, should displacement occur.

Kit Limitations

Some injuries are so grievous that without surgery, drugs, specialized medical equipment and techniques, the odds of patient survival are extremely limited. Likewise, some injuries while non-emergent, require very specialized treatment; for example, a detached retina. Finally, some diseases require special testing in a lab setting to determine the course of treatment. *All of these fall outside of what I and many others would consider 'first aid'.*

You can, however, provide real first aid care for an injured or sick person that will allow them to recover from their injury, with or without advanced medical intervention. You will find this the driving focus here. *Items listed are suggestions, feel free to change or add as you see fit to match **your** level of training.*

Multi-layer - what does that mean?

It means you have a series of medical resources (First Aid Kits) or modules if you prefer, each with different levels of items and equipment to match possible treatment of what the patient is presenting to you, the care provider. Simply put, the modules are designed to support the treatment of different levels of injury.

These levels are:

- Minor injury,
- Minor trauma, individual with limited bleeding
- Expansion module for minor trauma kit to deal with significant bleeding
- Major trauma - as bad as it gets
- Clinical or ‘sick call’’ type issues

Minor injury

Failure to care for even a seemly minor injury can kill you. Really, really. Dead.

How's that? My Grandmother was very alert to minor problems - she often told me that “The President's son *died* from an untreated blister” just before dosing me with some noxious concoction. As it turns out, she really had remembered a tragic death in a Presidential family, that of Calvin Coolidge Jr in 1924, from an infected toe blister.

Now, in real time - I worked with a youngster in the ER who presented advanced sepsis (blood poisoning). His knee was swollen, with ‘angry’ or bright red lines running up the leg. He was in pain with an elevated temperature. We used a large bore syringe to remove over 70cc of pus and cloudy liquid from the swollen knee before a drain was

installed. He was given IV antibiotics. After a hospital stay, he was released and made a full recovery.

What happened? He fell while playing, scraping his knee. His folks washed the area but *did nothing further*. Even as the child complained of pain in his knee, no further 'first aid' was attempted. On the morning of the second day after injury, he presented a swollen knee. Again, nothing was done until late that night, when his now frightened parents brought him into the ER. A string of bad moves that could have easily killed the child.

A simple **Individual First Aid Kit** (IFAK) would have been enough to properly treat this child for what began as a minor injury. In a multi-layer system, the IFAK is the first of four layers. The IFAK should have items that will:

-allow you to *thoroughly clean* an injury,
-provide some antibiotic ointment and
-give you something clean to cover the injury.

I keep one of several IFAK at hand, work or play. The size factor is focused on something small enough so that you always have it hand - in a pocket, purse, briefcase, or toolbag.

ISSUE - One per individual, extras for workspace.

Suggested contents: (you can have whatever you want, these are just suggestions)
Case - something to hold it all together. The case should be as waterproof as you can manage. Anything from a glasses case, to a Ziplock plastic bag to a small bag or pouch will work just as well.

Inside are

Several adhesive bandages - both strip and 'dot'
4 Providone-Iodine prep pads
2 foil packets of Betadine antibiotic ointment
2 foil packets of 'triple antibiotic ointment' - also sold as Neosporin
2 individual doses of eye drops in individual 'tear-off' dispensers
1 foil packet of lip balm (Blistex brand)
1 packet of Aspirin (2 tablets in packet)
1 2x2 sterile gauze packet
1 2x3 no-stick gauze packet
1 steel splinter tweezers
1 small LED'squeeze' light (optional)
1 book of military waterproof MRE matches (optional)
1 card with 5 ft of duck tape wound upon the card. - one 'stripe' of tape is 1/2 in wide, the other 1.5 in wide. The card itself is an old 'credit card sized' plastic card

The kit also has a 'manual pencil sharpener' which looks like a small folding barber razor. Small, it has a two inch 'razor' blade that folds into its handle for safety. It's just the thing for scraping off cactus needles and the like. There is room for a flat Fresnel lens to spot splinters. I keep one of these lenses in my wallet to save space.
The case is secured with a large rubber band, which helps keep the case inside of a pocket and can further be used as 'tinder' if a fire is needed.

A **Minor Trauma kit** is the next level in the multi-layer approach.

Minor trauma may be falls, twisted or sprained joints, cuts or minimal depth penetrating injury. This is not adequate for large lacerations, avulsions or deep penetrating injuries, it should do for the risk posed by your day to day outside activities.

ISSUE - One per individual, extras for the work area. Works with 'expansion' module listed next.

Why? On summer breaks from college, I worked for a geophysical exploration company. In remote Montana, one of our field crew was struck just below the knee with a chainsaw in a brush cutting operation. The saw cut deep, into the bone. The location of the injury allowed us to both treat and self-evacuate while treating. The crew person required surgery and a hospital stay but thanks to the care given in the field, was able to fully recover with no permanent loss of mobility. The module described here would meet the needs of this type of accident.

The basis (container) for this is the well known military Individual First Aid Kit, Field (NSN 6545-01-521-8502).
Still small in size (4-3/4 inches high by 2-3/8 deep by 4-1/2 wide) the kit pouch was designed to accommodate a waterproof plastic insert box which contained the components of the military Individual First Aid Kit. The first pattern (preferred) has snaps to fasten the cover flap. The case can be attached to any belt via two ALICE clips. This makes a good platform to build upon. The nylon cover is larger than the 'insert' allowing for additional items to be added. This container is available from multiple surplus sources on line.

This is for dealing with minor trauma with limited bleeding. Inside the nylon case you can place:

8 Providone-Iodine prep pads
2 hand wash packets (commercial - to clean your hands before or after)
1 aluminized mylar 'survival blanket' - this to wrap the patient should shock or cold be an issue
1 gauze eye pad
1 set (or more) latex or Nitrile gloves in Ziploc bag, not sterile, but clean
1 Insert, First aid (plastic)
The plastic insert box holds:
3 Dressing, First aid, Field, Individual Troop, 4x7 inches
(Optional - 2 Israeli trauma compression bandages)
1 Bandage, muslin, compressed - a triangular bandage, or cravat
2 Band-Aid brand bandage 2x3 in (larger than the 1 x 2 in ones used in simple kits)
1 Band-Aid bandage, extra large
6 adhesive bandages - 4 'normal', 2 small
2 foil packets, triple antibiotic
2 foil packets, burn get (Lidocaine)
4 large safety pins - for use with the cravat
1 packet electrolyte tablets
1 eye drops in tear-off dispenser

If you will support an industrial type operation, you may wish to add a pair of tourniquets. *Keep in mind, any use of a tourniquet will require you to seek advanced, professional medical care at a hospital or trauma center* ***as soon as possible***.

This **expansion module** is for the above listed kit. It is for more extensive trauma, with bleeding. This should be adequate for large lacerations, avulsions or deep penetrating injuries - but not penetrating chest injuries which result in a tension pneumothorax or those resulting in evisceration.

ISSUE One per two group members involved in industrial or dangerous activity with a high risk of injury minimum - one per person is better.

For my kit, this module is housed in a soft-sided nylon case 8 x 6 x 3 in deep. It has a strap handle and a clip to hold the case, should that be required. Color is optional, mine happens to be bright red with a First Aid logo on the exterior, but almost any waterproof container will work.

We had a call to respond to where a person had pushed their hand through a plate glass window. The person had severe and deep lacerations to the hand, with soft tissue avulsion ('meaty' parts of one finger removed to the bone). This kit would be adequate to deal with this level of injury.

This module contains:

2 sets of latex or nitrile gloves in Ziploc bag
1 package of 10 cotton applicators (Q-tips)
3 5 x 9 sterile combination dressing
2 Dressings, First Aid, Field 4 x 7 in
5 3 x 4 in non-adhering sterile gauze pads (Adaptic brand)
2 tongue depressors/splits
1 bandage compress, muslin - also called triangular bandage or cravat
1 non-stick gauze pad
1 eye patch
1 Band-Aid - extra large
1 roll, 2 in self adhering bandage
1 roll, 2 in bandage gauze with 2 safety pins
1 tourniquet
1 set steel tweezers
1 'travel sized' vial of 200mg Ibuprofen (22 tablets)
1 vial of spray Neosporin
3 swabs, tincture of benzoin for use with SteriStrips
2 packages of 'SteriStrip' wound closure strips, butterfly bandages are a substitute
15 Providone-Iodine prep pads
30 adhesive bandages (1x 2)
Plastic hard case insert (3.5 x 4 x 1 in deep)
5 2 x 3 non-stick gauze pads
1 3.5 x 5 in moleskin patch
5 eye drop doses in 'tear off' dispensers
4 large safety pins
1 #10 sterile scalpel blade

2 foil packets triple antibiotic ointment
2 foil packets ‘burn gel’ (lidocaine)
6 tabs Imodium (OTC)
2 packets electrolyte tablet (2 tabs per packet)

Major trauma is the next level module .
Mine is housed in a surplus M-3 Medic bag, it has supplies for dealing with major trauma, heavy bleeding, crushing injury. At this stage ***any*** injury you treat will require professional medical care found at a hospital or trauma center.

This level of kit is designed to provide pre-hospital treatment of large lacerations, avulsions or deep penetrating injuries which may result in a tension pneumothorax or those resulting in evisceration**.**
These kits are normally built based on the advice of a trauma physician and include items not covered in training at a level below P-EMT.

As such, I will just list *some* items to provide an idea of the level of care that might be provided -

4 sets latex or nitrile gloves
2 N-95 masks
1 set eye protection
1 SAM brand splint
2 Quick-clot gauze, large
2 Quick-clot gauze, small
20 5 x 9 sterile dressings
20 4 x 4 sterile non-stick pads
2 hot packs (hand warmers are fine)
2 cold packs
2 6 in Ace bandages
2 4 in Ace bandages
2 4 in self-adhering bandages
4 rolls 4 in Kerlex
2 Israeli Emergency Bandage 6 in with slider
1 Israeli Abdominal Emergency Bandage - 12"
or
1 Silver "H" Compression Bandage (optional as it is specialized)
1 set of OTC meds (ASA/INN/antacid/Sudafed) 10 packs of tablets in OTC doses
1 headlamp - LED - stays in kit.

This is a *sample* - I **strongly suggest** you discuss the items for this module with your own medical professional and factor in **your** level of training, location and risk exposure. I don’t discourage the view that having more ‘advanced’ supplies is a good thing, if for use by medical professionals to treat your group members in case the pros supplies are exhausted.

I will caution you about those 'advanced' supplies. In some States suturing, for example, is considered surgery, and requires professional licensing to perform. If all goes well, fine. If things go badly, you can expect trouble on many fronts. The Good Samaritan laws I am familiar with **do not** cover you if you perform advanced medical procedures

without the documented training and licensing required by the local authorities. If society collapses, this is most likely not going to be an issue. If this 'system' is for disaster support, it *will* become an issue. You can make that decision for yourself. Do not make it lightly.

Both so-called M-3 and M17 based "Medic kits" are offered online. The M3 bags are far smaller and easier to carry and work with in the field.
Prices range from under $30 to over $300.
You must examine the offered contents closely! The "trauma items" offered by some vendors includes such items as a 100 count package of Q-Tips, 100 adhesive strips (Band-Aids) and so on. These items are quite useful, but are not normally considered in the same class as pressure dressings or tourniquets.

Other vendors offer "Medic kits" as surplus and may include IV setups, IV solutions and other advanced treatment items. All of these advanced items have "use by" or expiration dates and may have issues with packaging that has not kept the items sterile. Use common sense or ask a professional. The medic bags may be purchased empty and filled as you deem appropriate. This is usually the best option. Consultation with a professional can save you money by not purchasing unnecessary, outdated or overpriced items.

The **clinical treatment** module is the final layer.
Here is where most of the 'hardware' resides. For me, it is a two part setup. I use a large tackle box which provides water resistant protected storage and a means to organize the items. The other is a commercial 'first aid' bag that folds out presenting many pockets to hold items. These are used to provide follow-on treatment and treat 'sick call' type complaints - earaches, foreign object in the eye, colds, hay fever and so on.

Typical contents are:

1 box of latex or nitrile gloves
Surgical soap or Betadine or Hibiclens Soap for cleaning your hands and any wound areas that require cleaning. Check with your medical professional on cleaning tips.
Eye protection and masks
5 x 9 sterile pads for wound dressing changes
Adaptic pads for still draining wounds or burn dressing changes
Steri-strips for reclosure of lacerations, if needed, when changing dressings
Multiple swabs, tincture of benzoin. for use with SteriStrips
Several oz of medical saline solution for wound cleaning, eye wash and so on.

- Several 2 oz squeeze bottles of saline are better then one big container.

Commercial dental kit + several teabags. Ask your dentist what is best for you.
Stethoscope and sphygmomanometer to monitor blood pressure in long term care, monitor for pulmonary sounds (like rales) and to check for distal pulse sounds.

Note - while the simple 'nurse' type stethoscope is just fine, the slightly more expensive Rappaport (two headed) type, with changeable diaphragms, offers better sensitivity.

A quality otoscope, for ear examinations, is an important item if your group includes small children. Some are sold with booklets containing color photos of different ear conditions.

A UV or Cobalt Blue light for in use in conjunction with orange dye (fluorescein) to detect foreign bodies in the eye or damage to the surface of the eye.
Used with saline solution eye drops, it can be used to confirm all debris has been removed from the eye. Ask your medical professional to demonstrate correct use before you use these items.

I'll suggest adding a set of 'hobby' headband magnifying lenses - very handy in most examinations - and allows hand-free use.

Some kind of notebook or other means of recording treatment. These records can be important in the long run, certainly valuable to medical professionals if you seek care after treatment.

Activated charcoal and syrup of ipecac are **not** included in this module. The American Academy of Pediatrics recommends that ipecac syrup **not** be stocked at home, the same for the charcoal. Activated charcoal can cause 'concretions' in the intestines, an often fatal condition.

You should closely examine those items your group will carry and consult with a poison control unit to determine risk and treatment if the substance is ingested, **now**. Examples include water treatment tablets, prescription medicines and so on.

A separate Over The Counter (OTC) carrier. These may hold:

24 Aspirin, 325 mg Tablet
24 Acetaminophen, 325 mg Tablet
24 Ibuprofen, 200 mg Tablet
24 Diphenhydramine, 25 mg Capsule
24 Diamode, 2 mg Tablet
24 Diotame Tablet
24 Alamag Tablet
24 Sudafed Tablet
3 Cera Lyte 70, 50 g Packet, Lemon
24 Loperamide tablets (Commercial name - **Imodium)**
12 Triple Antibiotic Ointment
12 Hydrocortisone Cream 1%
Printout - of all OTC meds, showing reactions, contraindications and safe dose levels
(Consult a PDR guide if unsure on OTC meds and interactions)

Checking with a medical professional on your selection of OTC meds is a good idea if you have members with prescription medicines or long term health issues.

Prescription drugs and antibiotics are best discussed and obtained from your health care professional. In many jurisdictions possession of prescription items without the accompanying script is a *felony*.

Do not carry any medicines or pills in unmarked containers. Period.

Why? Officer Friendly and his trusty canine companion just may not understand all those pills you carefully stored in baggies to save space in your BoB…. Avoid that dirty boot on the neck and those cold steel bracelets - *ensure all items are in the original and marked containers*. I buy my OTC meds in the foil packets that

are fully labeled. I've worked with Offer Friendly, so, you know, a word to the wise.

I have covered a module based approach for first aid treatment of:
*Minor injury, individual
*Minor trauma, individual with limited bleeding
*Expansion module for minor trauma kit to deal with significant bleeding
*Major trauma - as bad as it gets
*Clinical or 'sick call'' type issues
In layers that provide for mutual support, ease of carry and distributed carry - avoiding a 'all eggs in one basket' for medical support.

A milti-layered kit does not need to be expensive or massive - it does need to be tailored to you, your family or group. Check with your local health provider and get training *before* you need a FAK.

First aid supplies for your DIY kit should be determined by *your* level of training.

Chapter Six
Personal and clothing hygiene

More men were lost in the Civil War to poor sanitation than were ever killed in battle; this is true for the Boer war as well. I'll cover basic field sanitation, describe ways to wash your clothes in a disaster situation and list several ways to bathe while in less than ideal conditions. Being clean isn't about smelling bad, it is a health issue. This chapter assumes you have been forced from your home, and are not at a developed campground or shelter - that is to say, worst case. I'll cover in-home issues as well.

Field Sanitation

Sanitation in the field can be problematic. Water is normally in short supply and unless you are staying at a shelter or developed campground, there are no toilet facilities. If you cook your food, disposal of the wash water (and food scraps) will quickly become an issue as well. The U.S. Army has a manual, FM 21-10 (Or FM 4-25-12) should you wish to look at how the Big Army handles this - unfortunately, almost none of the material is of use for a small family or individual.

Since we've already covered 'Water' in a prior chapter, we'll move onto some of the more gritty aspects of the subject. Remember - DO NOT DRINK UNTREATED WATER>

Field Sanitation:

<u>Personal items and equipment.</u>

Some of the personal items that you should have in your kit *(for each individual)* are:

-Toilet paper and baby wipes - put these in a plastic bag to keep them dry (toilet paper) or from drying out (baby wipes).
-Lip balm and sun screen. Your skin is an entry point for disease, protect it.
-Foot powder
-Insect repellant - bugs will drive you crazy and some carry disease.
-Hand sanitizing gel - several small bottles are better than one large container.
-Toothbrush and toothpaste or tooth powder - good dental hygiene is important.
-Washcloth
-Large hand towel or microfiber towel
-Hand soap - several brands are sold for camping, like Dr. Bonner's.
*If you live in tick country, a small container of baby oil or Vaseline
*If you live in a very bug/mosquito prone area, a headnet and square of bug screen are a big plus.
*If you have the space, a hand-pump spray bottle or fold-up solar shower will come in handy.

<u>Equipment items:</u>

You will need at least a trowel or small shovel for individual use. For a family group, you'll find quickly that you need a real full-sized shovel if you will be on your own for

more than a couple of days. A modern 'tool, entrenching, folding' should be more than enough for a couple of days.
*Metal buckets - if you think you will be forced from your home for an extended period, a set of 3 gallon metal buckets are worth their weight in gold. I'll explain why, even if they don't make into our short term DIY disaster kit.

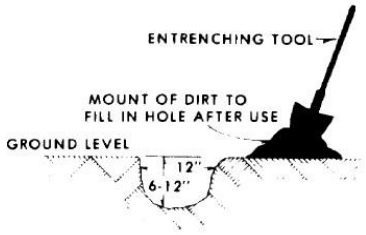
Bears poop in the woods, what about me?

Human waste *must* be deposed of properly as it poses a tremendous health hazard. If you do not have access to a cesspit or outdoor toilet, you will need to dig your own latrine or slit trench for human waste. ALWAYS bury your waste. This helps to keep it out of the local watershed and reduces the spread of disease.

Why? Simple - During the response to the Haiti earthquake, a single response team from Nepal started a cholera outbreak - from their toilet faculties leaking into the Meye river. In 17 months cholera had killed more than 7,050 Haitians and sickened more than 531,000, or 5 percent of the population. Lightning fast and virulent, it spread to every Haitian state, erupting into the world's largest cholera epidemic despite a huge international mobilization still dealing with the effects of the Jan. 12, 2010, earthquake.

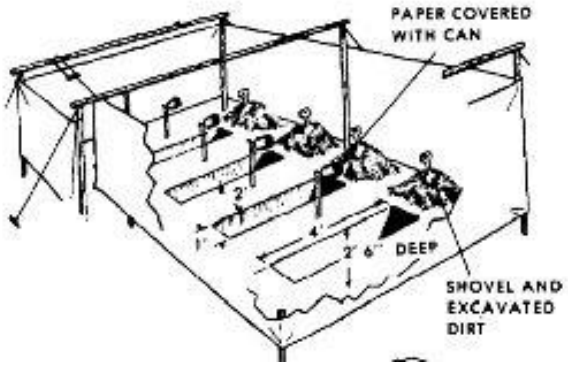
What should I do if hiking to a new or different location?

If you are on the move, you can dig a fast 'cat hole' (see image below) to bury your waste on a individual basis. The hole should be about a foot (8 to 13 inches) deep and about a foot across. If you are on grass or sod, cut the sod and lay it back, you'll use it later; set the evacuated dirt to one side. Once you have finished your business, I have seen recommendations to burn your toilet paper before burying the waste. After cleaning your hands, use the evacuated dirt to bury the waste and restore the sod, if at all possible.



Okay - what about a campsite with no facilities?

If you are forced to camp in an unimproved area, you will want to dig a slit (saddle) trench for disposal of human waste. The trench should be about 2.5 feet deep and as wide as you shovel. Pile the dirt at one end to cover your waste after each use of the facility.



(From Field Manual 21-10)

Is a squirt of hand sanitizer good enough to clean up after a bowel movement?

Wash hands your carefully after a bowel movement or face the consequences. I recommend washing with soap and water, and then use a hand sanitizer to endure your hands really are clean. Adults need to monitor children closely to ensure they clean themselves well and wash their hands as described. Locate your latrine well away from any water source and your camp.

What about my camp? What do I need to do there?

Food scraps and wash water.
These attract animals and insects. Wet garbage/food scraps may be disposed of in the slit trench if buried immediately. Dig a dry well (French well) and use it to dispose of your wash and rinse wastewater.

Garbage.
Gather and dispose of all garbage as it is generated, ensuring your disposal methods meet local laws/ordinances in this regard. Garbage is an attractant for animals and can pose a health hazard. If you are forced to bury your trash, dig a deep pit and cover the garbage as it is pitted. Burning of garbage may reduce bulk, but check local ordinances to ensure you remain legal. I'll have a bit more on this in the next section.

Food storage. Store food away from your camp area and secure it from insects. Inspect food closely prior to cooking to ensure it is free from contamination. In the case of your DIY disaster kit, a simple inspection to ensure the food container has not been breached should be enough.

Okay, I have everything for the camp - what about me?

Personal hygiene is important, no matter your circumstances. Washing your hands is the best defense against disease, and being clean is a major morale factor.

Brushing your teeth is not just polite; it can prevent larger medical problems, so pack a toothbrush and toothpaste or toothpowder for each member of your group. Mom was right, brush after every meal.
Concentrated "Camp soap" can be used for everything but brushing your teeth. Consider putting a bottle or two in your kit. Dish soap will do for hand washing, but remember, over time it can cause issues with your skin. If you don't carry camp soap, several of the smaller hand soap bars, often found in hotels, will work just as well. Shampoo in travel sized containers is a real morale booster - clean hair just helps you to feel better.

<u>You said something about a shower?</u>

You can take a 'shower' with very little water. I can assure you from personal experience, even cold water will work to clean your body, but tepid or even warm water makes for a better experience. Children fuss less with warm water. So, how do you take a field shower with little water?
Having been in short water situations, I first make a small 'basin' in the soil and put a plastic bag in the basin to catch the wash water runoff.
Add a couple of cups of hopefully warm water to your spray bottle. Strip and stand in the basin, then wet yourself with water from your spray bottle.
One cup of water (less, actually) will make a standard size washcloth more than dripping wet. Add soap or place bar in cloth work into a lather.
Wash. That is to say, scrub away. (If you are going to bathe more than one person, put the washcloth in a baggie/plastic bag to keep it both wetted and clean(er).
Use the remaining water in the spray bottle to rinse.
As dumb as this may sound, if you've never taken this kind of shower, practice at home first. Tell the children it's a science experiment. Measure how much water you use to wet and rinse yourself. If water is not an issue, then the so-called Solar Showers that hold anywhere from 4 to 5 gallons of water provide a more familiar experience. I keep one for camping and love it for showers.
The metal buckets, used over a stove or campfire, will heat two to three gallons of water for bathing, dishes washing or even laundry.

<u>Why make a basin to stand in?</u>

Capturing your wash and rinse water allows you to recycle it for washing your clothing. Yes, I know, ick! Think of it as a pre-wash - to get the worst of the dirt out before you hand wash and rinse the clothing. This kind of rough clothes washing isn't much of an issue with your DIY disaster kit, as we're aiming for no more than 4 days of support.
The metal buckets I mentioned earlier are just the thing to warm your water, use them as clothes washing tubs and to do your dishes. Obviously, they won't fit inside your DIY kit.

At Home Sanitation.

Water.

Most people are completely dependant on municipal water systems for their water supply. One item that I recommend to everyone with a bathtub is a bathtub bladder. These bladders will hold 100 gallons of pre-disaster water, presumably safe to drink. (SeeWaterBoB or bathtub bladder on-line).

Human waste disposal:
If you are on a septic system, you will likely have no issues, outside of a flooding situation. If you are on a city sewer system, you may have real issues and more quickly than you realize. Many of these systems use lift pumps to transfer sewage and when the power is out, the sewage will quickly back up, sometimes into your living spaces.
If you don't already have a backflow preventer, you should check to see how your local sewer system is configured, then decide if a back flow preventer is a good investment. I would recommend it in any case.

If you are on a septic system, use your kitchen and bath wash water or any other gray water to flush your toilet. Don't waste potable water - you need it to drink!

If you are unable to use your home sanitation system, you need to decide how you will deal with human waste. Sneaking out at night to dump your waste into a storm drain or runoff ditch will not make your neighbors happy.
A simple 5 gallon bucket, some trash bags and kitty litter will work, but again, you will need to have some way to dispose of the waste that is...call it ethical.
My best suggestion is to check with your local authority for what your best and or legal disposal options are in a disaster, *before* the need arises. Begin with your local Emergency Services Department or Emergency Operations Center. Don't be surprised if they cannot offer any specific plans to restore basic services as it is hard to plan for an event that hasn't yet happened.

Garbage:
A metal 55 gallon drum equipped with a wire hardware mesh cover to prevent embers from escaping may be your best bet for disposal of trash that will burn. Several holes in the bottom and sides of the drum will aid in the combustion of the trash. Cans may be crushed after burning to save on volume. Again, check with your local authority for trash collection locations in a disaster. Use caution when burning your trash.

Wash day:
Washing day need not be too terrible, but it will be work, make no mistake about it. A pair of plastic bins that hold several gallons of water as well as some kind of agitator will get you started. If clean water is in short supply, you will have to decide what will need washing the most.
Rather than re-invent the wheel, so to speak, I'll direct you to this excellent Brit site
http://www.tes.co.uk/teaching-resource/History-Washday-3004412/

Current non-electric cleaning offerings may be found at Lehman's on line.
https://www.lehmans.com/c-235-washing.aspx

Kit items:
Personal hygiene items listed above.

Optional - Collapsible buckets or washbasin. Check camping stores for possible sale items.

Chapter Seven
Communication and signaling

Communication is more than a cell phone. In this segment, I cover communications planning, alternate means of communication and the 'how it works' of commonly available communication equipment. Specifically, MURS, GRMS, CB, FRS and Ham radio are all discussed. I'll discuss crystal radios for fun and battery free listening.

Why do any planning?

Years ago, I lived in Las Vegas and at the time (mid to late 80s) the gangs and their seemingly non-stop drug turf wars were making the area quite dangerous to just go out and about. We had driven down a major road late in the evening, and the tires began to make a crunching noise. I stopped and used my searchlight to see what was making the noise. The road was covered with spent center-fire cartridges.
I saw mostly 9mm, but with a sprinkling of 7.62x39 brass thrown in for good measure. It seemed odd but at the time, I wrote it off as maybe someone had dropped a bucket of range pickings off the back of their pickup truck. As we drove on, we heard a mass of sirens approaching.
The next day, I mentioned this odd occurrence to a buddy of mine who worked for the local PD. He asked the place and time and then turned pale. We have driven down the street in the quiet spot between when the shooting stopped and the cops showed up from a 911 call.
A few minutes earlier and we could have driven into the middle of a firefight.

I had just purchased a new ICOM 2SAT handheld, a nice ham radio and one with a wide-band receiver. I was able to receive NOAA weather broadcasts and participate in the Air Force MARS system as well.
My wife was unhappy with the expense of the radio, and I have to say, in retrospect, she had a right to be unhappy. To her, it was just an expensive *toy*.
After this 'near death' experience, I quickly found I could monitor the local police dispatch calls on my new radio. One day shortly after that, we were on our way to a local computer store to pick up a part when the scanner reported an armed robbery in progress - in the very store we were going to visit! We were in the parking lot of the strip mall. Quickly pulling up to a big box store, we ran inside, stopping in the paint isle. When folks asked why we were crouching behind the cans of paint, we explained about the armed robbery going on next door.

Okay - neat story. So why does it matter?

By having and using the radio and the *real time information* it could provide, we were saved from walking into an armed robbery in progress. After that, we didn't go anywhere without the scanner. Period. As a bonus, I never take any static on the purchase of new

rigs, if they include a scanner function because now my wife sees that radio not as a toy, but a important *information gathering tool*.

So what does all this have to do with this planning?

I had never taken the time to assess my needs for communications and what, if anything, the comm equipment I did have could provide me in the way of information in a disaster. I knew about the NOAA weather radio stations, but hadn't given it much thought past that.
I see this planning effort as a two part process, how do I gather information of use to me and how do I communicate with the people I need to contact?
So, it was time to reassess my needs and see what I could live with and without. Here's a look at what communication assets are out there for *information gathering*, and how those assets can assist you.

Asset - Public communications.
I define this as broadcast reception of public / commercial AM/FM stations and NOAA broadcasts. These are a good source of information, but for the most part, rarely provide detailed information in *real time*.
For traffic reports, weather and weather alerts, a Sony SRF-M37W Walkman sport radio more than meets this need. Easy on batteries, and headphone only, it is a digital AM/FM/NOAA weather compatible and is without a doubt the best low-cost portable (and small) receiver I have seen for this band set. It runs on a single AAA battery, the only radio I own that uses this battery.

Planning issues -
The plus on these sources is that they are wide area; generally high power (easy to receive) and also provide an entertainment component.
The minus is that the 'news' and reports are rarely in real time and for the most part commercial radio stations just regurgitate whatever the local police and fire 'press releases' contain. It seems like nobody has old school reporters anymore.
Another down side is that of trust. Has the information released to the public been *screened* to prevent embarrassment of a public official or action taken by a political entity? You have doubtless seen the many and recent instances of bad or erroneous information put out over these outlets. Can you trust them for good data in a disaster? You can decide if these outlets are good enough for you. They most certainly are a source your neighbors will be listening to in a disaster.

Asset - Public Service communications.
This isn't just the cops anymore. Police, fire and utilities - here the power, water and sewer utilities are owned by the Municipality. They may be in your area as well. All of these services can have a direct and immediate impact on my life and that of my family. By monitoring these comm channels, I can gather additional information normally *not* contained in public press releases. I'm also experienced enough to know these comms may be less than accurate as well. But, just the same, it is information I want and nearly always in *real time*.

Planning issues -
You will need a wide-band scanner to receive these communications, and in many areas, the local government has used Homeland Security grants to add encryption to their everyday communications. You can check any number of scanner sites on the web for frequencies and technical characteristics of the comms in your area that are of interest to you. Some of these comms may be on so-called trunked systems, using a digital (P-25) common air interface. While scanners are sold that can easily receive trunked P-25 (and other) digital comms, they are not inexpensive and have a steep learning curve.
Radio Reference dot com is a good source of local public service communication systems. Shop around and read reviews before purchase.

Asset - Specialty communications.
All the wealth of other comms carried by radio is out there - air traffic control, railroad, private security, and on and on. While I don't normally monitor these, I do have a 'book', listing the frequency, owner and the technical specs should I think these communication links are something I want to monitor.

Planning issues -
You may be overwhelmed by the sheer number of licensed radio users in your area. Sorting out what can be of use to you is also a bit troublesome. For example, is the chatter between taxi drivers of any worth to you - day to day? Here it may be worth your time to see if there is a scanner club or like organization in your area to check with. Ham radio clubs often (but not always) have members knowledgeable on and willing to share about the local communications 'scene'. It doesn't hurt to ask.

CHECK LOCAL LAWS before carrying a scanner in your automobile. Some jurisdictions have made it illegal to carry a scanner in your car.

Asset - Amateur (Ham) radio.
I have enough portable equipment to cover all of the bands and modes of interest to me. Again, while information on a disaster might be carried on the ham bands, I also realize that the information may still be suspect or incomplete. To be sure, if I lived in tornado country, I would have the SKY WARN channels selected to monitor in any bad weather.

Planning issues -
Amateur radio operators are, by law, not allowed to encrypt or otherwise disguise their communications. A basic scanner will allow you to listen in on any comms that are on going. A side note is that ham radio is a dying hobby in many areas, due in part I believe, to inexpensive cell phone service. Just the same, if you have a scanner to listen to police/fire/ambulance calls, a little bit of work will provide a list of all the active ham radio repeaters in your area. The Radio Reference site mentioned earlier has a tab for ham radio.

<u>How can I talk with others if the cell service/telephone lines are down?</u>

Talking with other people requires several things. A receiver, a transmitter, power for the equipment, an antenna and any required license to legally use the transmitter. The person you wish to communicate with must have equipment that is compatible with yours. You must have an agreed upon frequency or channel where you will meet and you both should know how to operate the equipment both lawfully and in a technically competent manner. Wow - sounds like a lot, eh?
This can be as simple as both of you agreeing to meet on a CB or FRS channel at a certain time.

Looking at MURS, GRMS, CB, FRS and Ham radio shows:
MURS - The FCC website pretty much says it all:
The Multi-Use Radio Service (MURS) is in the 151 – 154 MHz spectrum range. The most common use of MURS spectrum is short-distance, two-way communications using small, portable hand-held devices that function similar to walkie-talkies.
Similar services include General Mobile Radio Service (GMRS) and Family Radio Service (FRS).

Background
The Multi-Use Radio Service (MURS) dates back to when the FCC changed the rules for five industrial/business frequencies known as the "color dot" frequencies. You've likely seen this kind of radio in use at big box stores.

Licensing
The Multi-Use Radio Service (MURS) is licensed *by rule*. This means an individual license is not required to operate a MURS device. You can operate a MURS device regardless of your age and for personal or business use so long as you are not a representative of a foreign government.
If you are interested, the FCC service rules for the Multi-Use Radio Service (MURS) are located in 47 C.F.R. Part 95.

Channels
There are five MURS channels and the channels are either 11.25 kHz or 20.00 kHz each.
151.820 MHz (11.25 kHz)*meets new narrow band requirement
151.880 MHz (11.25 kHz)*meets new narrow band requirement
151.940 MHz (11.25 kHz)
154.570 MHz (20.00 kHz)
154.600 MHz (20.00 kHz)

Operating a Multi-Use Radio Service (MURS) Device
You can operate a MURS device in any place where the FCC regulates radio communications. *A MURS device must be certified by the FCC. A certified MURS device has an identifying label placed on it by the manufacturer.*
None of the MURS channels are assigned for the exclusive use of any system. You must cooperate in the selection and use of the channels in order to make the most effective use of them and to reduce the possibility of interference.

No MURS unit, under any condition of modulation, shall exceed 2 Watts transmitter power output.
Unlike FRS, you *are* allowed an external antenna, which will extend your range considerably.

Bottom line -
So, MURS - No license, 2 watts, VHF, no-restrictions on and external antenna okay. For non-hams, likely your best bet for limited range VHF-FM communications. You can lawfully use high gain antennas and there are no height odious restrictions for the antenna. A wide range of commercial equipment is available. See my note below on the new FCC rules.

GRMS - The General Mobile Radio Service (GMRS) is in the 462 - 467 MHz spectrum range. The most common use of GMRS spectrum is short-distance, two-way communications using small, portable hand-held devices that function similar to walkie-talkies. Bowing to reality, in 2010, the FCC proposed to remove the individual licensing requirement for GMRS and instead license GMRS "by rule". As with MURS, this means that an individual license would not be required to operate a GMRS device. **This proposal is still pending**. There are currently 23 GRMS frequencies or channels.

Operating a General Mobile Radio Service (GMRS) System
A GMRS system consists of station operators, a mobile station, often comprised of several mobile units and sometimes one or more land stations. A base station is a radio that has an antenna no more than 20 feet above the ground or above the tree on which it is mounted and transmits with no more than 5 watts effective radiated power (ERP).
None of the GMRS channels are assigned for the exclusive use of any system. You must cooperate in the selection and use of the channels in order to make the most effective use of them and to reduce the possibility of interference. You can expect a communications range of five to twenty-five miles.

Bottom line -
So, GMRS. *Maybe* no license, 5 watts, 23 channels, UHF, limited external antenna okay. For non-hams, likely your best next best bet for limited range UHF-FM communications. Remember, today, a license is still required. A wide range of commercial equipment is available.

An important note on GMRS and MURS. Radios manufactured after November 13, 2000 are not legal on MURS, unless it was a purpose built for MURS (Type Accepted). Why? In an effort to promote greater spectrum efficiency, the FCC is requiring all Public Safety and Industrial/Business licensees using 25 kHz VHF and UHF radios systems migrate to minimum 12.5 kHz efficiency by January 1, 2013.
So here we are. A lot of older commercial radios are currently flooding the market - and at very attractive price points. *Before you buy anything*, ensure it meets with current FCC bandwidth rules.

FRS - Family radio service. Mandated low power (0.6 watt) and no external antenna allowed relegate this to the 'toy' category. Also known as "kiddie-talkies", they may be of some limited use in and around a campground to keep track of family members.

CB or Citizen Band. Operating at the top end of the HF spectrum (27 Mhz), this service has been around, well, almost forever. Limited by law to 4 watts on AM modulation and 12 watts on SSB, it offers a solid choice for low-population rural areas. External antennas have no restrictions, offering a low-cost way to extend the range of your 'system. While expensive, I would say that a SSB system is the only viable type of CB to own or operate and have any expectation of communication with others in your family/group.

Amateur Radio.
This is the preferred disaster communication system. Entry level licenses are simple, code-free and easy to obtain. In many areas, ham clubs offer free testing. Licenses are good for 10 years. You will have access to multiple bands and impressive power levels. With this also comes the *responsibility* to operate your equipment within the rules and in a technically competent manner.
Visit the www.arrl.org website for more detailed information - it is far more than can be covered here.

What other things should I worry about?

No matter what equipment you decide on for your use, consider the following.
Battery type. All of my equipment runs from "AA" batteries and I have the adapters/cables to run from 12VDC auto systems as well. If you have a piece of equipment that has a NiCAd or NiMH battery pack, ensure you can run it from a secondary power source. Most personal communication radio sets have an "AA" battery tray to replace the NiCad or NiMH battery. Buy it when you purchase the radio, you won't be sorry.
Antennas - Or, rather, antenna connectors. No matter what you end up buying, get adapters to allow use of both BNC and so-called UHF cable plugs.

Have a plan! All the radio equipment in the world is of no real use if *everyone* in your family/party cannot operate the radio. Plan ahead, write down the plan and practice with the radios. Children as young as 8 years old are more than capable of operating complex equipment, if you take the time show/train them. My son got his ham license - back in the day with the code test, at age nine.

I was looking at ham radio equipment and man, is it expensive!

I guess this is how you define expensive. *Quality* gear will cost some real money. Don't expect that Big Box store bubble pack radio to give you much in the way of good service - they are low cost for a reason. Quality, but older VHF FM radios can be had at a very good price point if you just look a bit. If you are not a real gear head, enlist the help of

someone who knows their stuff, just as you would for any purchase of used equipment - chainsaw or radio.

Why do you say the FRS a no-go?

Originally pushed by Tandy/Radio Shack, they were aiming for a UHF, no-license rule to sell low-cost radios. There are so many restrictions, from power to antenna types that the range is abysmal and there are so many users that in many areas, the service is all but useless. You have better choices - take them.

Is CB any good to stay in touch while we travel?"

Yes. Yes, it is. Even though I have an Extra Class ham license, I carry and sometimes use a small CB set to stay in touch with others as we travel, very convenient. Listening to the truckers adds an element of entertainment not often enjoyed. I have a quality magnetic mount external antenna I leave in the rig.

What can I do to keep my communications on the ham bands private?
Nothing. Any attempt to disguise your communications is expressly prohibited by law. The FCC has absolutely no sense of humor. I would add that fines *start* at $10,000, for each infraction. Bad idea.

That said, you can reduce the number of folks listening into your communications and do so quite legally. ICOM sells a series of D-STAR radios that feature digital communications.

D what?

The D-STAR stands for Digital Smart Technologies for Amateur Radio. It is an open-source standard digital communication protocol established by the Japanese Amateur Radio League. Since it is an open source standard, it is legal to use. I don't know of any commercially made scanner that has D-STAR capability, so your communications will have a low probability of intercept as we used to say in the military.

For HF, the AOR corporation sells the ARD series of 'voice modems'; a vocoder that goes between your mike and the SSB radio. You need a pair of these, one at each end, to work. Without the proper equipment, your communications are unintelligible. Again, perfectly legal. Both of these modes are expensive, so it is no cheap fix. In my book "*World of the Chërnyi - Going Home*" I have the characters use other, legal, means to communicate and reduce their chance of intercept.

For the technically adept, FreeDV is an open source sound card based digital voice system worth a look. It requires two sound cards to operate. A small device is now for sale that will do the same thing, no PC needed. Called the SM 1000 Smart Mike, they sell for around 200 dollars each. You'll need at least 2. Look up Rowetel on line.

One last thought related to secure or private communications. Unless you are prepared to invest in a pseudo-random frequency-hopping, direct-sequence, spread spectrum radio system, legal by the way for hams, you are not going to have 'secure' communications. If you emit *any* electromagnetic radiation (EM), over a very wide range of frequencies, you can be tracked and your location pinpointed - quickly. Face it; if an EC-130 Compass Call is out looking for you, you've already lost.

Stay within the law and be a good communicator.

If you want a fun no-battery, non-EM emitting radio receiver, look back in time to the crystal radio set. When set up, they do not need batteries, can be made to cover shortwave broadcast frequencies and are completely inert - that is to say, they do not emit any radiation. FM reception is not possible with a basic crystal set.
Build your own or buy a kit. I once took a group of Cub Scouts out into the desert around Las Vegas and we found everything needed to build a radio in the junk that people had thoughtlessly dumped out in the desert.

Kits can be found here - http://www.midnightscience.com/kits.html
The XS-402 The Little Wonder Crystal Radio Kit is one of the smallest crystal radio kits I've seen, just the thing for your Bug Out Bag.

My suggestion for a disaster receiver?
A Sony SRF-M37W Walkman sport radio in water resistant bag

Optional-
A wide-band scanning receiver. I have found older units for as little as $15 at garage sales.

Chapter Eight
Tools and Repairs

In this Chapter, I'll briefly discuss the common, lightweight tools you should have on hand for use in a disaster.
The classic saw of "A stitch in time saves nine" is more correct than not. I'll describe a small but comprehensive sewing kit and a larger tool for use in repairing large tarps, backpacks and the like.
Since this DIY disaster kit is designed to support you for about four days, absent access to a shelter or other infrastructure, you should have some simple equipment in your kit.

Recommended DIY Disaster Kit tools:
Common pocket knife, folding.
Your fingernails and teeth are with you all the time, but won't be of much help you try to open a can of food. So, a *quality* knife is called for as a priority. One I have found useful is a ***Camillus*** brand US Stainless Steel Knife. This knife features a 2 3/8" blade, can opener, punch, and screwdriver/cap lifter. The blade doesn't lock, so some care in use is required. If you choose to add a locking blade knife, check your local knife laws! Another good choice is a classic Swiss Army Knife, one with a can opener, but not much more.


Camillus brand knife

Multi-tool.
If a folding pocket knife doesn't seem like it provides enough flexibility, there are several multi-tools on the market that include everything up to and including a socket set. I have found that a 'real' pliers and a pocket knife provide more functionality than a multi-tool. YMMV as they say. There are many, many types and brands of multi-tool on the market today, use care when purchasing.

A minimal sewing kit.
This may be a simple as a single needle pre-threaded and stored in your first kit to a dedicated sewing kit with multiple needles and a variety of threads, buttons and scissors in a small case all by itself.

A commercial kit, say one sold by WebTex, has needles, thread, scissors and a folding case, you can build your own for less, but sometimes a pre-built kit has the advantage of saving you time to gather and case the items yourself. I'll describe how to build one in a bit.

*Sewing awl.
This is a heavy duty tool for repairs of webbing, backpacks, even your shoes. Optional.

A knife sharpener.
A simple tool used to keep your knife sharp. One I have found to be both effective and easy to use is marketed by Gerber as their "Pocket sharpener". Under four dollars each, they work well. Lightweight, they can be attached to your keychain.

Hand trowel.
In an earlier chapter, I listed a trowel or small folding shovel. I wouldn't recommend a plastic trowel, but there are many good choices in your local garden section. True surplus folding shovels should provide good service as well. I checked the price of new, USGI issue folding shovels today (1/12/13) - they are priced at $80.61! Just so you know.

Heavy leather gloves.
Yes, I consider these to be a 'tool'. I have listed these here as a pair of good quality, heavy leather gloves should *stay* in your disaster kit. They will go a long way to protect your hands, because if you injure your hands, you will find life becomes much more difficult. You need these to handle hot pots, firewood - if you have a fire, and other rough chores. Consider carrying a set in your vehicle as well.

Means to start a fire.
I suggest that both a disposable lighter and a ferrocerium fire starter be in your kit along with a small container - say, a 35mm film can, with a few cotton balls soaked in Vaseline. While I have strongly suggested that an alcohol stove is your best bet for disaster cooking, many will want the psychological support that a campfire offers.

LED headlamp.
A flashlight is nice; a headlamp allows you to have both hands free to perform a task. One that has multiple light (output) settings and an adjustable headband is best. I would avoid those lamps that use so-called button batteries, an AA or as a second choice, AAA battery powered units generally provide better service.

Duck tape.
Yes. Duck tape is the Universal fix-it. Tear your pants? A strip of duck tape will keep things together until you have the time to break out the sewing kit. Wind several feet on an old credit card.

Hatchet or axe?

For the most part, no. It is unneeded. Most of the wood you would burn will be small enough to break with your foot, and if too large for that, burn it in half and push the ends into the fire. Many jurisdictions consider this as a potential weapon, most shelters will deny admission if you have one in your possession.

Water tote.
Unless you know you will have a nearby source of good water, a means to carry up to a gallon of water is something you should consider. This can be a pair of 2 liter soda bottles or a folding water bag. Remember, one gallon of water weighs eight pounds.

Can opener.
A military P-38 or its larger cousin, the P-51 take almost no space, but work a wonder at opening cans. Even if you don't have canned food in your kit, I still recommend having one at hand. I have found them useful for any number of things.

*Earlier I mentioned a small AM/FM/NOAA radio set with headphones and a spare battery. Since it is equipment, I'll list it again hear as a 'must have' - consider yourself nagged.

Car kit
I add more equipment in a 'car kit' as an outgrowth of this personal DIY disaster kit.
I'll mention a so-called Pioneer Tool Set. Common to the military, it is something to consider for your truck/Jeep or other off road vehicle.
This set is a full sized axe, a full sized shovel and a mattock or pick-axe. Often added to this is a 20 pound double jack and a 'Hi-Lift' jack. Others have added a come-along or hand winch, rated at two tons or more. If you are not trained in the use of an axe - and it is a skill, a bucksaw or hand chain saw will work well. Always include a file and a stone to keep the tools sharp.

Any number of websites provide a massive number of lists of 'must have' items in a disaster kit. These authors offer any number of reasons why you need such and such an item - and these may be valid reasons. Since this kit is designed to pretty much sit in a closet until needed, I would think that cost is a major driver in both the quantity and quality of the items you select to put in your kit. I'll make suggestions, you make the choices, as *you and only you* know the needs you may have and the skills you pisses.

* * * * * *

A simple sewing kit.
You can purchase any number of pre-made kits, but you can build your own for a lot less. Start with an old gift card or other flexible plastic card about the same size. Make two small cuts - slits, really - about 1/4 in deep at the end away from the end where you will wrap your tape.
Wrap one end -twice - with duck tape. This will allow you to place a #1 Sharps (a type and size of needle) on the card by pushing it into the tape. Sharps are normally sold as a set for a few dollars - so shop around. A #1 Darner needle may be a good substitute. I suggest adding a second, smaller needle. Thread both before you add them to your

sewing kit. Now you can wrap more thread - both thick and some thin, around the card using the cuts in the card to hold each end of the thread.

A credit card sized sewing kit.

One thing to consider adding to your sewing kit is a thimble and a threading aid. This kit is small, has everything you need to make a simple repair in the field and should fit into one of your Individual First Aid Kits with room to spare.

Again, these are suggestions for equipment items to have in your disaster kit, items of most use to you will be driven by your location and where you plan to shelter if forced to leave you primary residence.

Capstone items-
Everything listed in this section.

Chapter Nine
Safety and Personal Defense

This Chapter is a brief discussion of safety issues faced by those displaced by a disaster. I'll list some ways to protect yourself and family members, your valuables and offer suggestions on ways to avoid problems before they impact you. A brief discussion covers the pros and cons of carrying a firearm - since laws in the US vary so wildly, I cannot offer specifics for your area.
The safety issues faced by people displaced by disaster are multifaceted. Even if you seek shelter in an 'approved' Red Cross or other organizational sponsored shelter, you need to remember - "Safe" is relative term.

For this reason, I'll begin by saying, *if you don't <u>have</u> to leave your home, don't.*
Some climate related or technological accidents (man-made disasters) will leave you no choice. Flooding, long term loss of utilities or the releases of deadly toxins from a transportation accident are just a few of the reasons you might have to leave home. You should have a plan and "Know Where to Go" should you be displaced. Your County, State or maybe even a local Emergency Services department should have a list of pre-approved shelters and who is slated to run those shelters. That is no guarantee that the shelter will be, open, habitable or livable, but it is a starting point and one you should know.
Weather extremes - hot or cold, are the primary reason I suggest knowing where your nearest shelter is located. These normally have at least minimal facilities for heating/cooling and basic sanitation - normally.
What if a shelter isn't available or is full/uninhabitable? Friends or relatives used to be the place to go, but as many families are scattered across the Nation, this option has become less of a choice for many - especially if transportation is difficult or impossible and distances to relatives are great. A nearby motel is a possibility, but if the disaster is widespread, likely these facilities are damaged as well. Last choice would be a developed campground. These will usually have basic sanitation (cesspits) but water may be an issue in the best of times.
Living out of your vehicle in a parking lot or on the street is the ultimate *last* resort. You'll find no relief from the heat or cold, face the lack of water and no sanitation will soon show this option is the worst of all possible options. If you own an RV, things may be acceptable for a short period, but without a sewer dump station and fresh water, even these soon become unacceptable.
Bottom line - if you are forced to displace from your home, you will likely need to travel some distance to find a place to live until and if things return to normal.

Once you leave your home, you have become a "refugee".

<u>What do I do now?</u>

Once you have found shelter, you need to decide how you will ensure your own safety. Few public "shelters of last resort" will have an assigned security staff or police and are intended for very short term use. This means you are on your own. Determine where the exits are located and if they are actually operational. If you are traveling/sheltering as a family, plan on one adult staying awake as the others sleep. Most shelters have no food or water, if the public water system fails. In my research, most jurisdictions tell you to bring your own food and water to a shelter. Most people won't. If you travel by car, I would suggest you leave any food items in the auto trunk. I'd hate to be the one person with a packet of cookies surrounded by a mass of unprepared folks who haven't eaten all day...

Rarely do public shelters have cots, bedding or blankets. More organized areas and Red Cross shelters do have cots and may even have blankets. This is why you have a blanket in your DIY kit.

Sanitation will be a big issue, so bring your own toilet paper and hand sanitizer. Putting these in a small bag or purse makes it easier to carry. Understand now, that at unstaffed shelters, the sanitation faculties will get nasty - fast. Women may want to consider carrying one of any number of available 'sanitation devices' or female urination device (FUD) (this is how they are found on the Internet) which will allow use of the facility without the need to make personal contact with a filthy toilet surface.

Water from public sources (water mains) may be compromised after a disaster. Unless you *know* the water has been treated, any water obtained from drinking fountains, facets or hose bibs *must* be treated. The water tote in your DIY disaster kit will make a great 'holding tank' for the time it takes for your treatment method to take effect.

Public shelters may or may not serve cold meals.
Consider the following. If you can't wash your hands with hot, soapy water after a bowel movement - neither can the food handler. Unless the food is pre-packaged, I would exercise extreme caution on eating anything served. Life may be miserable, but life in a shelter while fighting a bad case of diarrhea from contaminated food or water is a far more miserable existence. Use some sense, and have at least some packaged food in your kit.

A shelter will be noisy. A few sets of foam earplugs will go a long to allow you to sleep when it's your turn. For the same reason, a set of earbuds for your radio will go a long way to reduce tensions in a shelter area.

Finally, most shelters are in public schools, so find a comfortable corner, set up in the corner and be prepared to make the best of it.

<u>What about my valuables?</u>

Real valuables, that is to say cash, money, precious metals and so on should go into a lock box at your bank. I've not seen any bank vaults wash away in a hurricane. Paper items should be sealed in a plastic bag just in case the vault floods.
Banking with a large bank or credit union - one with branches far outside of your local area, will provide the best bet to have or retain access to your bank account information and the money it represents.
Contact your insurance agent to confirm what documentation you need to file a claim - and gather the necessary paperwork or photos/images now.
Your paperwork and copies of your insurance documentation can go into your lock box - again, protected from moisture. But before you lock the papers and photos up in your lock box, take the time to scan them and then store the data on a so-called USB thumb drive.

RENTERS SHOULD ALWAYS HAVE RENTERS INSURANCE! Sorry, didn't mean to shout, but a basic policy is only about $100/year. Just to replace your clothing and kitchen 'stuff' would cost many times that much. Spend the money, you won't regret it. No, call your agent right now. Don't wait.

You may not have the paperwork in hand, but a digital copy is normally enough to at least get started on the claims process. The price and size of these storage devices have fallen, so more than one copy is not only possible, but recommended - but take the time to put some kind of simple encryption on the device is case you lose or it is stolen. The internet has many, many sites that describe just how to encrypt this kind of data. Find one that matches your operating system and hardware. One last thought - save your 'paperwork' as an image file onto a SD chip device. If needed, a one hour photo can 'print' out your paperwork for claims...

Carrying large amounts of currency after a disaster is almost a necessity - if the electricity is out, credit cards are worthless.
Avoid displaying large amounts of cash! In private, put different amounts in different pockets. Remember, small denominations are best, a mix of one, fives and tens are best. If few places will take a hundred dollar bill now, even fewer still will want to bother with them in a disaster. One exception to that would be to pay for lodging. Combo lock car safes are available that bolt under a seat. Give this some real consideration if you live in an area where frequent evacuations are required. Money belts are an old school solution worth considering as well.

When I say security, most folks I know think of some kind of firearm. And while being armed can provide a sense of security, please take the time to think things through. Once you pull the trigger, you own that bullet until it stops. And forever after. Don't believe that a shooting event in a disaster will be treated differently - it will not. In the afterwards, and there will always be an afterwards, you will have to face the results of your actions.
Having said that, there are predators that inhabit disasters, so check you local gun and knife laws *now* to fully understand what is legal and more importantly, what is not. If

you haven't received professional training of the safe handling of firearms, get the training now.

What about safety once I return home?

Safety equipment.
Heavy leather gloves, safety glasses, hard hats, dust masks and thick soled leather boots should be part of your clothing choices if you will be doing any kind of cleanup or demo work at home. Debris will be scattered and present sharp surfaces that can injure you. If you are planning on doing any backhaul/salvage of home contents, you still need the gloves and good hard-soled shoes.
If your community has a debris removal/disposal plan, ask for a copy of it now. If they don't, consider bringing up the subject at a planning or Emergency Services meeting.

Sanitation -
If you are on a septic system you generally won't have a problem, if on a city sewer system, check to see that it is operational before using your home facilities, if they are even available.
I've covered water and food in an earlier segment.

Home security.
This is another area where folks might think a shotgun is all that is needed. I would suggest a bright search light/floodlight and someone to use it will provide a lot more security for your belongings. Thieves will generally stay away from an area they know is being watched. So, again, one adult should plan of being awake all the time until things return to 'normal'.
Here is where knowing your neighbors and watching out for each other is golden. If you belong to a Neighborhood Watch, it is worth asking about what actions are planned, post-disaster. It is certainly worth asking. If you don't have a Neighborhood Watch, at least consider asking your closest neighbors what might work for your area.
I hope this segment has given you some things to think about now and the push to add these items to your overall planning.

So, are you saying a having a gun is a dumb idea?

No, I am not. What I am saying is that security is a lot more than having a firearm. And depending on where you live, the laws covering firearms can very - wildly - from city to County to State. So if you chose to carry a firearm, ensure you *know* the laws in your area. A jail cell is a crappy place to shelter. I am also saying that you ensure you know how to employ that firearm, legally, before you start packing. That means professional training. Get some - training. Again, a jail cell can be a lonely place to be.

So, where is a good spot in a shelter?

If you are forced to stay in a public shelter, find a small space, with a fire exit, or window. A corner is better, as you have two walls to your back. Some spot as far away

from the toilets as possible, for obvious reasons. If you can snag a couple of chairs or a table to use with your blanket to make a 'tent', you will find it easier to sleep and have a tiny bit of not-quite privacy. The reality, of course, is that there is no 'good spot' inside a public shelter.

What services can I count on in a public shelter?

That's an easy one to answer. NONE.

Okay, what options do I have?

Do you own your own home? I've built a 10 x 12 'shed' in my back yard, and set it up to support a stove, if needed. It is insulated and has a small sleeping loft. This shed can be pressed into service as a shelter should my primary residence be so damaged as to be unlivable. My fall back is a 5th wheel RV. Both are expensive options, but I live where it is both cold and suffers from earthquakes. I look at the shed as dual use, holding my gardening equipment now and the RV is our summer escape vehicle. If you rent a home or duplex with a yard, the landlord may allow a small storage shed. A camping tent may allow you to at least stay near the remains of your home as you recover what belongings you can.

Man, you seem pretty hard over on renter insurance, why?

I've seen people burned out of their rental unit, with the loss of *everything* they own. Then it hits them, with no insurance, they are starting all over again - from scratch. Basic policy coverage starts at under $100 a year, the least expensive coverage you can buy. Well worth the ten bucks a month. The landlord's insurance won't cover you, so you need to cover yourself.

Refugee? Are you kidding me?

Noun
A person who has been forced to leave their home or country in order to escape war, persecution, or a natural disaster. Homeless and without support.
Do you want to be that person? I don't.

Where can I learn more?

FEMA has on line lessons covering, among many things, shelter operations.
See: training.fema.gov/is/
Course IS-7 *A Citizen's Guide to Disaster Assistance*
and
Course IS-22 *Are You Ready*? An In-depth Guide to Citizen Preparedness are recommended as your first courses. There is no cost for these on-line courses. I've complete most all of the courses. This training will help you understand better what the Federal Government will for you and to you in a disaster.

Capstone items-
USB thumb drive, encrypted. Encryption software is on the drive as well.

Chapter Ten
Travel and Navigation

If you can't tell the players without a program, you'll find travel far more difficult without a map. I'll discuss common map products, then provide a listing of where and how to obtain free or low cost map products for your use. I'll cover compasses, and point you to free, on-line training sources for the use of your compass. While a GPS receiver is nice, it does have some real-world drawbacks, I'll discuss those drawbacks.

Just like at the ball field, if you can't tell the players without a program, you may soon get lost if you lack a map to keep you on track. So, let's start this discussion with why have a map in your DIY disaster kit? Simple, you need one.

Why do I need any Maps?

If you're like most folks I know, you have a favorite route to get places. If asked to give directions, I suspect you'll use phrases like, "Turn at the gas station" or "Go two blocks past the school, then turn right." You drive or travel places everyday - to work, the grocery store, to see friends and even over the river and though the woods to visit grandmother. For your everyday needs, this kind of landmark based navigation it works great.

What happens, though, when the river overflows its banks and wipes out the bridge you always use? Where is the next bridge up or downstream? Is a ferry available? How do you even get *to* the next bridge? Where are the low spots most likely to get flooded when the river escapes its banks? Is there even a long way around to get home? Well, if you had the right set of maps, and understand how to read the maps, you would have a lot less to worry about. Tornados can remove familiar landmarks, a map will help you navigate in this circumstance.

What kind of maps do I need? Are there different kinds?

There are many styles and types of maps - almost too many to list. So, for this DIY disaster kit we will examine just a few. Back in the day, gas stations would give away or sell at low cost a variety of travel maps. These provide a basic layout of a defined road system and give a general idea of distances between fuel stops or towns. These fill a legitimate need and for what they are, doing a good enough job, if everything is going along normally. Many do not show secondary roads and may have outdated information. Nothing ruins your day like finding a bridge that been washed out for two years or a highway under construction stopping your journey cold. The older the map, the more likely you are to be surprised - in a bad way.

Several vendors offer trip planning services with current information and a map printed just for your trip. Many people find this service useful enough to support a minor industry. Other vendors offer travel guides that are updated yearly, One of the more

famous travel guides is the "Milepost" magazine - it details, mile by mile, the ALCAN highway and several side trips. The magazine says it is updated yearly, but as with any published guide, it's best to check in advance for price and availability for lodging, repair services and so on. Businesses come and go all the time, so any published guide is just that - a guide. The older it is, the more suspect the information within. "Lonely Planet' offers a series of guides that enjoy wide popularity.

Are these guides any good for a disaster kit?

I would suggest there are better products.

The better choice would be a Gazetteer for your State/Providence or a select series of topographical (topo) maps. The DeLorme series of maps are nicely bundled for each state and contain both topographical type maps and well the road system for major cities. Each book, or atlas as they are called, runs about 20 US dollars and for the information they contain, are a wonderful bargain. At 11 by 15.5 inches they are handy without being too large to handle. (http://shop.delorme,com) Each of the atlases has a key to explain the sometimes cryptic marks on the map.

A dedicated topo map of a specific area, usually sold by the US Geological survey (USGS) gives the most data at scales varying from 350,000 to 1 all the down to 24,000 to 1. Put another way, at the 1 to 24,000 scale, one inch equals 2000 feet. The maps are sold by Quadrangle and section. They may also be referred to by how many minutes they cover - that is 7.5 minutes, 15 minute and so on. USGS map products do show cityscapes, but as with most any printed document, can suffer from the lag time to print - and therefore may be less than accurate in a fast growing area. The more development in an area, the more all maps suffer from this lag.
(http://nationalmap.gov/ustopo/index.html to order maps from the USGS)

To obtain free (and current) USGS topo maps go to -
http://nationalmap.gov/ustopo/index.html and select the map for your area of interest. You can print these at home. I must warn the scale will not be exactly as listed owing to how your printer works.

Are you kidding me? Free maps?

Yes, indeed. Your tax dollars at work. They are free because you print them out. If you want a map that the scale matches the printed product, then order the paper product from the USGS, the instructions are on the same page. About 10 dollars per 7.5 minute map.

Will this work for everyone?

The free maps download to your computer as a .pdf product. It will work as well as any other (large) .pdf. Be warned, most files start about 18 Megs in size, not for the faint of heart or those with dial up modems.

What if I don't have a printer or want a full scale map?'

Stores that sell and service drafting plotters often offer a print service for customers. Take your .pdf file down and see if they will print it for you - expect to pay for this. You may also have you map printed on opaque mylar or Tyvek, both offer a durable and water resistant product. Finally, outfits like REI offer custom printing of maps for a reasonable fee.

I use (brand name) maps on my (iphone/android phone/gadget) - why should I use USGS maps.

The USGS is the *standard* for map accuracy. Software based maps have so many issues; I will not recommend them to anyone.

What's will all those lines? Are they of any use?

That data, those lines, are what make topo maps so valuable. The USGS page has an explanation of what each line represents. This information is both on-line and too long to cover here. Go, read, learn.

What is a compass and why do I need one?

For a quality topo map to be of the most use, it should be oriented, that is to say, lined up north to south the way it is drawn. This alignment makes it easier to relate terrain features you see to the map in front of you. To navigate - travel - using a map as a guide, a compass is a necessary tool.

What kind of compass should I get for this kit?

There are so many different kinds and styles of compasses, from cheap button compasses to pocket transits costing several hundred dollars, the new user can get confused. Let me list a few simple things to remember -

-Real Quality costs real money. There is a reason that 'Chinese marching compass' or 'military style' compass *will not* work as good as a US made, milsurp prismatic compass - Quality. That is why one costs 5 dollars and the other costs 60 dollars. Just as there is no free lunch, there is no 'cheap and accurate' compass. The world just doesn't work that way.

-The *best* compass is one you know how to use to get the most from your map. Each compass has a purpose. A hand bearing compass works differently than a Pocket Transit - both can be used to navigate. I'll narrow this down in a bit

-If you will use the compass in North America, buy one made to work in North America. Don't pay extra for a so-called World Needle - it's legit, you just don't need it.

-In my opinion, a compass that will allow you to set declination (offset between the real Geographic North pole and the Magnetic North pole) is a worthwhile extra cost feature. You will make fewer mistakes.
-A compass that has some kind of sighting system will allow you to navigate more precisely.
- Get a compass marked in degrees unless you plan on running a field artillery unit. (360 degrees vs 6400 mils found on military units)

So, now what?

So - lets look at a very expensive compass - and some better suited to your kit.
First is a Brunton Pocket Transit. Arguably the most accurate hand-held compass you can buy> At several hundred dollars copy, it is certainly expensive. While in college, I worked for a GeoEx company and we used these Pocket Transits to lay out mining claims. I would love to have one for the cool factor alone, but it is serious overkill. What's next?

Next is a Cammenga brand military prismatic compass. Cost - about 60 dollars or so. The dial is marked in degrees (in red) and mills, the needle is glow in the dark and as you can see, East and West are highlighted. The outer dial is marked in one degree notches, so you can use it in the dark.
An excellent bit of kit and is well worth the money. Okay for your kit, but still a bit of overkill. What's next?

The Silva brand 'Ranger' compass. This item is listed at 51 US dollars on the Silva website.
Rugged, has a sighting system, can be used to quickly orient you maps and has map scales on the base plate. Huummm, almost prefect. This model allows you to dial in the declination. And then?

The Silva Guide model 426 - ahhh, just right. About 15 dollars on-line. Comes a variety of colors, and it floats. The sighting mirror has a Vee notch at the top of the mirror's sight line. The compass needle itself is made out of tungsten steel with a friction free sapphire bearing -so it moves freely. The compass is filled with clear antistatic liquid, so no annoying bubbles inside the dial or needle flutter. You can fold the cover back behind the compass if you want it be out of the way, say, while using a map. 2.5 inches square, it takes up little space. Did I mention, it will float? The dial is divided in 2 degree increments.

There are other compasses out there. Many are well made and a quality product. I've been using Silva and Suunto products for over 5 decades and they have never failed me. I'm writing this, so the Silva Guide is my recommendation. You can make your own choice, of course. Please take the time to compare features and quality, and then worry about the cost. Because if your cheapo compass fails or is inaccurate, how big a bargain is it in the end, really?

Okay, now I have a compass. How the heck do I use it?

Books have been written on this, so I'll point to several on-line resources and let you pick the one you find easiest to understand.

www.uvm.edu/~goldbar/FM3_25.26.pdf
Field Manual 3-25.26 Map Reading and Land navigation. The Army way of using a compass. A good read covering all the basics, and them some. Features a prismatic compass as seen above

http://www.learn-orienteering.org/old/
A series of lessons on orienteering, itself a kind of race requiring navigation to precise locations. An oldie but goodie

www.nwcg.gov/pms/pubs/475/PMS475_chap4.pdf
Easy to read illustrated guide for the beginner or advanced field person.

http://www.ussartf.org/compass_basics.htm
Short version for folks wishing to brush up on old skills.

The only way to be comfortable using a compass - is to use one. Buy a map of your local area and then use the compass that will go in your kit to navigate from point to point! It can be a fun family activity. Try it.

Is a (brand name) compass better than...

Some compasses are priced higher than others. More money doesn't always better quality, but Quality does cost. Sapphire bearings cost more than those without, and so on. There are a number of Indian knock-offs of the Brunton Pocket Transit made of brass that are great paperweights. I'd never count on one to find North.

Do I really need to orient my map?

When you are doing so-called paper exercises, planning, measuring distances, identifying hazards like low lying areas - no. In the field using the map to get from Point A to Point B, I would argue that you do need to orient the map for best results. Any one terrain features may look the same as another if you aren't sure of your exact location.

I don't need a compass, I have a GPS!

I'm happy for you; I hope you live to tell your friends about your adventure. Most GPS units offer a heading feature - acting *like* a compass. I *know* the compass I use is accurate to + / - 1/2 of one degree.
What about your GPS unit? Good luck on finding that information for your unit. I have a nice GPS unit and use it when doing photography overseas for industrial operations,

marking the place I captured the image in a database and log. This is different than land navigation - a lot different.

Are you saying a GPS is no good?

No. I am saying - *be careful*.
Printed maps and GPS coordinates may not always agree. Some map products - mostly outside of North America anymore, may be 'off' by upwards of several miles. The older the map data, the more likely this is to happen. Why? Because some products are using data obtained before the GPS system was in place. I have maps based on 1950s data, the data on the map is good. Think about it, mountains haven't moved, but the geophysical coordinates don't match up to my GPS - all owing to systematic surveying errors from back in the day.

You've likely heard to the stories of people blindly following their in-car 'navigation system' and driving into lakes, rivers or even the ocean. A map requires a bit of care and should always be considered an aid to your travels. The older the map, the more care should be exercised, items build by man may be removed by nature, so any map you use to navigate from your home to a place of refuge should be vetted.
Pick and drive your primary and alternate routes at least yearly. City road maps should be replaced on a regular basis, especially if you live in or near a fast growing area. Use your maps in advance to find choke points - bridges or overpasses/railroad bridges that could collapse and block the roadway. Mark and know the low lying areas that may be prone to flooding.
Maps are a wonderful tool, once you know and understand how to use them. Take the time now to do that before the need arises.

Capstone items-
Local maps
Military lensmatic compass - simply because I have one.

Chapter Eleven
Morale and Mental Health

If you have children, you already know dealing with a bored child is almost as bad a dealing with a bored adult. I discuss some low cost and light weight items to carry that can make a difference in the inevitable down time faced when away from home and familiar surroundings.

The pounding on the door in the middle of the night, the fire crews shouting - "Get out, get out now!" You throw your kit in the car, grab the kiddos and head down the street. Listening to the radio, you discover where a shelter is located and now here you are, happy and lucky enough to be sitting on a cot, amongst rows of cots, in school gym or large indoor sports complex.
Now what? Well, if you have the items listed in this kit, you should be good for a couple of days, but that about the fire/flood/earthquake/disaster? Is your home/condo/apartment/hovel safe, or even still there? How do you get news, and keep the kids occupied?

Morale - What is it and why does it matter?

Morale is often defined as the mental and emotional condition of an individual or group with regard to perform the function or tasks at hand OR the level of individual psychological well-being based on such factors as a sense of purpose and confidence in the future. If you're worried sick about your home and contents, it may be hard to impossible to focus on the simple day to day tasks in front of you.
For this I can offer scant advice. Having valuables, certain papers and negatives or photo files in a safe place like a bank lock box and good, quality insurance will go along way to reduce the worry.
Keeping your mind occupied will help. Not knowing and boredom can quickly wear a person down. This is the primary reason for having a small portable radio with headphones or earbuds so that you may listen for local news.

I have a radio, but what else can I do?

Having a book (or two) to read can help reduce what will quickly become a forced idleness. A small notebook and a ball point pen to journal your thoughts will also go a long way to help reduce the tension.
Some folks will argue that modern cell phones have a multiplicity of games and other entertainment, and I will agree, up to the point of the ability to keep that device charged. I would also caution that display of an expensive device in a public shelter may not be the smartest thing in the world. Keeping these simple caveats in mind, I will agree that a good cell phone is a valuable asset, for both entertainment and for gathering data.

Other small and inexpensive items, like a deck of common playing cards, a small cribbage board or an inexpensive multi-game 'travel kit' take little space but will yield hours of entertainment.

What about my children?

Children in a disaster situation pose some unique issue sets. Past diapers, cleaning wipes and formula that should always be in a diaper bag - babies are not 'easy' to keep entertained. As a grandfather, I enjoy watching young families as I move through airports on my travels. Air travel is the closest thing I can relate to a shelter situation. You have limited space, may well be in crowded public areas and cleanliness for your child is always a concern. Infants may be kept in their car seats, but once they become active, that choice becomes limited.

A urethane or vinyl coated 'painters tarp' cut into squares may offer the best of many choices. Cut into 4 foot by 4 foot squares these can laid on the floor to offer a clean and waterproof play space or clean area for your small child. A single 8x10 'tarp' will give you two play squares and two 4x6 floor ground covers for keeping you blanket clean. If you find yourself outside, these will make nice picnic table covers should you find yourself in a campground.

For older children, a small backpack - for just that child, with a change of clothes and a couple of their toys will go a long way to reduce tensions caused by boredom. If you are one of the folks that count on the television to entertain your child, be forewarned, you will have problems. Children that watch a lot of video - TV or movies, tend to have shorter attention spans and as a result may become easily bored. I would say observing the child at play with the toy you plan of taking will give you an idea on suitability. Don't forget, as children age, their needs and taste in toys will change.

Important note - Noisy toys are *never* a good choice in a shelter situation.

Mental health

Volumes of books have been written about mental health during and after disasters. If you have a family member or are a full-time caregiver for a person with mental health issues, consult with your professional health care provider. Take the time to describe those hazards that your planning has led you believe will cause displacement and the shelter/refuge you plan on using. Checking with local authorities to determine what, if any, special needs shelters or similar spaces are available should be part of any planning. If there are no special needs shelters, consider asking your local authorities to designate one as such.

Capstone items-
Paperback book
1 set of miniature playing cards

Chapter Twelve
Important Documents

What should I do about my important documents (passports, insurance, license, etc)

It's a fact of life that we all have a paper trail following us through our life. If your home is damaged, or destroyed, having the right papers can make a major difference in how rapidly your life can be restored. Take a few minutes now to determine the documents you should have with you, and what other measures you can take to safeguard important documents such as birth certificates, DD-214s from military service, marriage certificates, insurance papers and so on.

I'll begin with a service most political entities (State or County) offer - recording of documents. This is where the document is 'recorded' by the State, so if needed, an 'official' document may be produced for legal use should the original document be lost or destroyed.

What can be recorded? Here where I live in Alaska - the State will record.
The following list indicates some of the various types of documents that are recorded in the official records of the state of Alaska:
Deeds, Mortgages,
Assignments,
Modifications,
Reconveyances,
Notice of Liens,
Claim of Liens,
Release of Liens,
Uniform Commercial Code Financing Statements,
Security Agreements,
Judgments and Decrees from courts,
Federal and State Tax Liens,
Child Support Enforcement Liens, Satisfactions and Releases of such liens.
We also, from time to time receive Last Will and Testaments, Birth Certificates, Military Discharge papers (DD-214),Death Certificates and Marriage Licenses.
However, we are not the normal and customary place for filing these records, if they meet minimum acceptance criteria, they will be accepted and placed in the public record

County offices often offer such recorder services. I took the time, and paid the fee, to record my military discharge paperwork. The title to my home has also been recorded. Items such as replacement auto titles and the like are usually covered by the division that collects taxes on the item.

I've made digital copies, as both .pdf and .jpg of other important documents and placed them on an encrypted thumb drive. ALWAYS ENCRYPT any such storage device. This allows me the option of printing the document or having it produced as a photo. The documents are then stored inside a thick (6 mil) zip bag, inside of my bank lock box.

Take the time now to ask your insurance agent how the claims process works for the company you have chosen for your insurance coverage, if this is a document, it is worth taking the time to scan and store in your lock box. Check yearly to see if the process has changed. Knowing where to start and a road map of the claims process can reduce the pressure after a disaster.

Another important document often overlooked is photographs or images of your property. Literally thousands of high quality images can be stored on a USB thumb drive or SD card for use in filing an insurance claim. Having dated images of your furniture, clothing and other household goods will go along way in the claims process. Check with your agent for the type and quality of images needed for a claim. Getting that information in writing is even better. Store the thumb drive or SD card in your lock box or someplace off site. The data will do you no good if it is destroyed as your house burns down.

A color copy, laminated, of your main passport page - the page with your image, may allow you to leave that document in safe storage, and use the copy. Having the page copy will make replacement less stressful.

A complete listing of all credit card numbers, company contact information and related data stored in a safe place at home will be more than handy if you lose your wallet/purse and there may be legal reporting requirements involved - check with the card issuer.

In closing up this chapter, I remind you that the cloud of paper you are surrounded with is an inevitable by-product of modern life. Protecting that paper, keeping copies of that paper and having a means to reproduce the paper documents is now longer a luxury - it is a necessity. Take the time to examine your personal cloud of paper and protect those most important.

Capstone items-
Credit card listing

Capstone Project

Okay - show and tell time!

Here is the Yukon rucksack discussed above. This is the material for the kit wrapped up in the tarp. I used a length of rope I had on hand to tie the package. This rope is oversized so you can get an idea of how it was tied up. So - what does this hold?

Skivvy roll, unrolled. The underwear sits atop of the nylon shell pants/top. The polypro long johns sit atop of the other clothes.

The blanket is folded in half, then in thirds. The clothing is folded into the blanket as it folded in thirds.

The blanket folded. You can see the Nalgene bottles.

This is the ground cover and insulation mat. A standard windshield sunscreen is long enough to provide insulation from your shoulders to your knees.

Ground cover folded for stowage.

The tarp is folded in thirds, then in thirds again. This will create a pocket that will hold the blanket items. Here you can see the thirds, thirds, thirds fold pattern.

Completed Yukon ruck before rope added.

The wrapped product was seen on the cover. Feel free to experiment on this part - there is no "right' way.

I made this prototype Yukon ruck and luggage cart as part of my research for a story in my "*Tales of the Chërnyi*" book. In one of the stories, the main character makes this kind of 'system' to carry items he finds as part of his camping/survival gear. This prototype has a set of ALICE shoulder straps and waist belt I happened to have on hand - to my surprise, they worked better with this setup than with the LC-2 frame issued by the military. The cart was a $2.00 garage sale item.

Here's a better view of the prototype. The milk crate is for scale. The poncho and paracord were left outside for ease of access. Here you see the ruck tied up with paracord and held with webbing. Experiment, what works for you, works for you!

Now - about pitching that tarp...

How hard can it be? I turned an eight year old loose with some string, some nails, a stick and said "Make a shelter". This was big enough for my six foot frame.

Here is a USGI surplus poncho laid on top of a standard size nylon shower curtain. In another "*Tales of the Chërnyi*" story, the main character uses a shower curtain as a shelter. This gives you an idea of the relative sizes of both.