Do you want to respond to a disaster to provide medical care? There are certain prerequisites. Not in terms of your medical training – medical care after a disaster is just like medical care before a disaster, only more so: all sort of medical issues, from traumatic cardiac arrest to managing diabetes mellitus and congestive heart failure, and not enough people to provide care.

But there are self-sufficiency prerequisites. There is an apocryphal story of the doctor who turned up after a big disaster and told the County Emergency Management Coordinator “I’m here to help. I will need a place to stay, a shower, and something to eat.” And the County EMA coordinator, whose home had been nearly destroyed, and who had no shower for two days, and almost no sleep for the past three days, said some things to him that can’t be repeated here before threatening to have the county police remove him from the county. (I lied. The story isn’t apocryphal. It’s true. I was there. At least for one of those incidents. I suspect it has happened at other places and times, too.)

In order to not be a burden on those you wish to help, you must be self-sufficient. You may not be able to be totally self-sufficient – for instance, without law-enforcement training, it’s hard to provide your own security. For that matter, even if you have law-enforcement training and a gun, it’s hard to provide security at the same time you’re providing medical care. But you should be as self-sufficient as you can.

Major self-sufficiency requirements for your response to disaster include:

- Security
- Shelter
- Water
- Food
- Communications (and information management)
- Navigation
- Travel
- Medical Self-Care (“Force Protection”) and care for others

This requires having the right equipment. Yes, good equipment is expensive. If, as with most of us, you have to buy it yourself, think of it as a donation to the cause of disaster medical response.

Imagine a really OCD-ish person, one who has been involved in search and rescue and disaster response for 45 years. Imagine the equipment such a person would acquire over the years, and then imagine that this person has made a detailed packing list with lots of footnotes. Better yet, instead of imagining, look at it online: conovers.org/ftp/SAR-Gear.pdf. It may give you some ideas for making your own checklist.

Disclosure: other than having paid $20 back in ~1969 to become a member of the REI co-op (www.rei.com), which I also heartily recommend to you, I have no financial or other connections to any of the gear I recommend here. Really.

Security

You will likely need to “contract out” your security, either to security officers who will travel and stay with you, or to local law enforcement. Best would be a combination of both, to make sure you have someone dedicated to your security, as well as the advantage of local knowledge. In addition to your common sense, you should consult your security experts and take their advice. If you can find some other organization that is responding, you may be able to stay within their secure perimeter. In search and rescue, we have a saying “a dead rescuer never did anyone any good.” It applies to disaster relief as well.

You should also consider public health issues as part of your security plan as well. A sick rescuer doesn’t do anyone much good either. Ever heard stories about an ice rescue gone bad? Or a cave/mine rescue gone bad? The first rescuer doesn’t come back, so a second, and then a third goes in, before people realize that maybe it’s not a good idea to go in. You don’t want to provide such a story for disaster medical lectures. Before going, investigate the expected hazards and prepare for them. My handout on ticks and tickborne diseases at conovers.org/ftp/Ticks.pdf has some advice on insect repellents.
that might be of use, as might the handout http://www.conovers.org/ftp/Poison-Ivy.pdf.

Shelter

In most disasters, there is not enough housing. Hotel rooms are seldom available, and if they are, they often have no electricity or running water, and in particular, no hot water (I have experienced this about 5 times, most recently in San Juan after Hurricane Irma). In some disasters, even finding a place to throw a sleeping bag inside without a roof leaking rain on you is nearly impossible (that happened to me after Hurricane Gustav). For when it is impossible (often) you’ll need not only a sleeping bag and sleeping pad, but a lightweight tent.

At this point you may have realized that we are basically talking about backpacking gear. And indeed, after a disaster, even an urban area can turn into a wilderness. So learn from those who frequent the wilderness and enjoy it – not only backpackers, but, since you’ll be providing medical care in a disaster-induced wilderness – from wilderness search and rescue teams.

There are many similarities between disaster medical response and wilderness search and rescue:

- **TIME:** In both the wilderness and after a disaster, people can’t get medical care right away. It often takes a long time to reach people; sometimes you can’t even find the people who need help. And once you find the people and start providing care, you may be stuck giving care for a long time. The option of calling 9-1-1 sometimes doesn’t exist, or it may take hours for a response.

- **DISTANCE:** When you want a patient in the backcountry to go to definitive care at a hospital, first, you have to get the patient out of the wilderness. After a disaster, a hospital, particularly a specialty unit such as a burn unit or dialysis unit, may be far away, as local hospitals or specialty units may be closed. Arranging a 3-hour ambulance ride is not uncommon. You may be miles from the nearest hospital – it takes your ambulance and EMS crew hours to get there, and it may take hours for a response.

- **TERRAIN:** Heading across a trackless wilderness to a patient is not for the inexperienced. And after a disaster, roads may be flooded or closed by debris, making travel times far longer than usual. Road signs may be missing, making route-finding (very much needed due to road closures, especially if Google Maps, if it even works, keeps routing you back to a highway with a missing bridge) near-impossible. You may need an axe, bow saw or chainsaw (bring your own gas and oil) to clear deadfall from the road to allow passage.

- **WEATHER:** In the wilderness, you can’t go inside to get out of the weather. The same applies during many disasters. You have to be able to not only survive but to carry out your tasks effectively regardless of the weather. This requires proper clothing for the environment. *(There is no such thing as bad weather. There’s only the wrong clothing. —anon Norwegian)* For those who collect abstruse bits of disaster knowledge: raindrops not only hurt when they hit your eyes at more than 60 miles per hour; but they also deform your corneas and make it very hard to see. When you are doing a belly-crawl in a hurricane, a pair of swim goggles are quite helpful.

- **EQUIPMENT:** When heading into the wilderness, you have to choose your personal and medical equipment with care. You can only take what you can carry on your back, and you can’t zip back home to get something you forgot. In a disaster, you might be able to drive all the way to where you’re going, but you’re similarly limited to what you can fit into your vehicle. And sometimes, you’ll have to carry all your gear, on your back or in your hands, a significant distance. So choosing sturdy, lightweight equipment is key. In wilderness rescue, we frequently judge items based on their usefulness-to-weight ratio. Things that are very light, or have multiple uses, are prized by wilderness and disaster responders alike.

Back to the subject at hand, shelter: teams often provide lightweight backpacking tents, and tend to get ones that do not require guy lines and stakes. Such freestanding tents may be set up on an asphalt or concrete parking lot, and I’ve even seen groups of them set up inside a large warehouse to provide some darkness and privacy for sleep; I pack a Big Agnes 1-person tent on every deployment and have used it inside large buildings multiple times. If you might respond without such group tents, a 1-person REI Passage 1 tent (reicom – great place to get lightweight gear, and recommended as a source) sells for $140 and weighs less than 4 pounds. Lighter versions cost more.

An alternative to a tent is a “jungle” hammock. It can’t be set up on a bare floor, but it can be strung between two trees or similar objects, and keeps you up off the ground (useful when it’s wet, muddy, or there are fire ants). During the hurricane Katrina response, I used my Hennessy Hammock every night; at one point, it was strung up between a couple of pillars on an abandoned hospital. The Ultralite Backpacker Asym Classic costs $230 and weighs 1 lb. 15 oz.

Many experienced backpackers advise people to concentrate more on a good sleeping pad than a good sleeping bag. A sleeping bag gets squished underneath you, and when it’s squished, it doesn’t insulate. To avoid a cold butt, you need a pad that insulates well. You can get one of the fairly warm (R=1.4) blue closed-cell foam pads from amazon.com for for $13 or a much-better RidgeRest pad from REI for $30 (R=2.8, much more comfy). They’re fairly light (10 oz), but they’re quite bulky. And they’re not all that comfortable. Or, you can spend well over $200 on a ThermaRest NeoAir XTherm mattress, which is warmer (R=6.9), weighs a tad more (15 oz for a medium), bulks about a tenth, and at least to me, is

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2. R is a standard value for insulation, whether it's clothing or the insulation under the roof of your house.
...about as comfortable as my mattress at home. There are a great variety of choices in between.

For a disaster sleeping bag, you probably want a mummy bag of artificial fiber: it’s not as affected by water as much as down. You should get a three-season bag rated to around freezing (32°F), as you can always make it warmer with a liner inside it or a sleeping bag cover or even a blanket over it. Such a bag, such as the REI Trail Pod 15, costs less than a hundred dollars.

Experienced backpackers and climbers probably have a down bag with a GoreTex or similar exterior, which is half the weight and half the bulk, and three times the cost, but they also use it all the time and know how to take care of it. Only get a down bag if you’re willing to baby it.

Shelter includes clothing, particularly for cold and wet environments. You need to know the principles of clothing selection for such environments, starting with the three Ws.

- **Waterproof**: if you’re going to have to go out in the rain, you need good rain gear made of GoreTex or other waterproof-breathable material. You need both a jacket and pants. Get ultralight version such as the Outdoor Research Helium rain pants ($120) and Helium II jacket ($150): they fold up small enough to fit in a large pocket.
- **Windproof**: if your waterproof-breathable parka doesn’t have pit zips (underarm zippers) for ventilation, and you sweat at all, then you might want to have a separate non-waterproof wind shell. They are very light and some are suitable for mild to moderate rain.
- **Warm When Wet**: mountain rescue people have a saying that “cotton kills.” Cotton blue jeans and flannel shirts are warm and comfy when dry, but soak up cold water like a sponge and hold it against your skin, losing all insulation value. You need clothes – both tops and bottoms – that retain their warmth when wet. Long (and short) underwear such as Capilene (a brand name of Patagonia, a highly-reputable outdoor clothing company) not only retain most of their warmth when wet, but wick sweat – so that your sweat rapidly spreads and dries – are quick drying (you can wash, wring out, put on, and let it dry on you if necessary), and are treated to retard bacterial growth. That last means that, even after several days without a shower, you don’t smell nearly as bad. Wool and polyester fleece have similar qualities.

Any time you deploy to a potentially cool or cold environment, bring a week’s worth of wicking, quick-drying underwear (quick-drying bacteriostatic briefs are appropriate in summer, too), and either wool or fleece tops and pants (fleece dries faster, wool takes longer to get smelly). Consider “soft-shell” pants which have a tough outer surface and a soft, wicking, warm-when-wet lining, and like the underwear mentioned above, may be washed, wrung out, and put back on to dry. I can’t say you will enjoy it, just that you can do it; it’s only a quarter as miserable as wearing wet cotton, and dries maybe ten times as fast. Leaving it hanging overnight to dry is better. Some warm-when-wet shirts, a couple of wool or fleece sweaters, and hat and gloves or mittens, completes your cool-weather wardrobe.

To learn more about how to select outdoor clothing, see my Clothing Materials Table and attendant essays at conovers.org/ftp/Clothing-Materials.pdf.

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**Water**

**Hepatitis A, Giardia, Infectious diarrhea, Amoebic dysentery...** you can get a fascinating variety of illnesses from bad water. And you can’t depend on someone else to provide you with potable drinking water. And sparkling clear water can be full of pathogens.

So how do you make sure your water isn’t bad? There are many sources of badness in drinking water: industrial chemicals, pesticides, and mine drainage, for example. (Take your water from upstream of such sources of such pollution if you can.) But the most common badnesses are the protozoa, bacteria and viruses that cause disease when ingested. To purify water of these pathogens, there are multiple methods.

Simply bringing water to a boil will kill everything that will cause problems when ingested. You need to boil for 10 minutes to kill spores that can cause wound infections, but those spores won’t cause problems if you ingest them.

Or, you can treat water with water purification tablets, available for under $11 for 20 tablets at REI. Get the chlorine dioxide type. Used properly, they will kill off everything you need to worry about.

You can use Clorox bleach to treat water, but the amount and the time it must be in contact with the water varies with the temperature and turbidity of the water, and is suitable more for disinfecting large containers of water.

Backpackers tend to use water filters as they can relatively quickly pump water out of a shallow stream, filtering out the relatively-large bacteria and protozoa as they pump, and the carbon in the filter helps absorb pesticides and other chemicals. However, neither this nor other backpacking water filters will remove viruses such as the Hepatitis A virus. I use an MSR Hyperflow Filter (7.4 oz, $100) myself when hiking – it’s a good way to get clean water out of a shallow stream or pool into a water bag attached to the pump. However, if you want to protect against viruses, too, then you need to treat the water even after pumping.

There are a large number of other ways to purify water – little tiny straws you suck water through, to large gravity-fed filter systems – but none are as appropriate for small groups of responders as what I list above.

Not only do you need to purify water, you need something in which to safely store it. Most people bring a single one-liter water bottle, but a way to store larger
amounts is a good idea. An MSR DromLite bag that will hold 6 L (1.5 gal) weighs less than six ounces. Platypus brand water bottles fold flat and weigh almost nothing. A multi-use device is the Sea to Summit Pocket Shower. Folding up to the size of a couple of cellphones and weighing less than 6 ounces, this serves not only as a water bag containing 10 L (2.5 gal), it also has a tiny shower head, allowing it to be used to take a shower when no running water is available. Unlike the MSR bag, though, it doesn’t have an easy-to-use spigot. However it has a very high usefulness-to-weight ratio. Mark that concept – usefulness-to-weight ratio – and keep it in mind when selecting gear.

Food

When one thinks about disaster food, one thinks about MREs: military Meals, Ready to Eat. Once upon a time, a Disaster Medical Assistance Team Strike Team was sent to an island off the Gulf coast right after hurricane Katrina, with cases of mixed MREs as their sole food. However, the cases were mislabeled, and they contained nothing but pepper steak dinners. If you buy me a beer sometime I will tell you what they thought (and said) about MREs. However, being old, I have survived on C rations and even tasted K rations (the canned predecessors to MREs) and I will tell you that MREs are fine and I (and you) can subsist on them indefinitely without being too unhappy (at least if they’re not all pepper steak MREs).

MREs are available with flameless heater bags that will heat a main course even in deep winter.

MREs are a bit low in dietary fiber, and high in fat to provide lots of energy for fighting troops, so if you eat a healthy diet, supplement with something high in fiber. Some dried fruit seems to be a fairly universal addition to people’s MREs.

I know many DMAT members, who are required to carry a day or so of food in their packs, who just thrown in an MRE or two. The only problem with that is that MREs are heavy. There are lighter alternatives. Again, look to backpackers and climbers: they tend to take freeze-dried meals, which are very light. There are also compressed versions that pack small; the Mountain House brand is (deservedly) the most popular, though there are several reasonable alternatives. They do require water for rehydration but if you read and heed the previous section you shouldn’t have a problem providing the water.

P.S. Those little tabs of chewing gum in the MREs? No, they’re not laxatives. Maybe they should be. But they’re just gum. I have this straight from Dr. Askew, who designed MREs and many other interesting foods for the military, including high-carbohydrate pocket milkshakes for working at altitude.

There are other things worth taking; recently the fat in nuts has been found to have health benefits, and fats provide far more energy per unit weight than carbohydrates (starch and sugar) or protein. Almonds are my favorite: salted for the summer, plain for the winter. Stoned Wheat Thins are a fairly dense, sturdy cracker that makes a pretty good survival food, though I really like those MRE crackers and I bought a bunch online and a can of tuna in olive oil or can of Costco chicken, and MRE crackers dipped into a small cup of applesauce, is my entire family’s favorite day-hiking lunch.

Communications

It’s hard to stay organized in the face of a disaster. There are multiple aspects of keeping organized; while this isn’t the place to discuss it in detail, using the Incident Command System (ICS) has major benefits, especially since it’s now almost universal across the US. As boring as the courses might seem if you’ve never been in a disaster, you really, really, really need to take some online ICS courses. They are free. Go to training.fema.gov/IS/crslist.asp and take at least IS-100), IS-700, and IS-800.

I once responded to a disaster (can’t tell you the details without shooting you first) where one of the primary needs was for what I call “information first-aid”: things were so busy before we got there that keeping track of patient care was very, very fragmented.

You should figure out some method of medical charting for when you get there. Simply having pencils and lined paper and clipboards and some waterproof folders in which to keep your records might be enough. Having carbon paper (remember carbon paper?) to do charting in duplicate may help when you need to send medical records out with a patient. Having a pre-planned system for tracking patients and charting on them is even better, but beyond the scope of this tutorial. If you are thinking about some sort of an electronic charting system for your group, remember that you may very well have no electricity; bring a generator and fuel. And check out my blog at ed-informatics.org about design and usability of tracking systems.

Cellphones can be quite useful in a disaster, provided you have a way to recharge them (I carry a spare battery, both AC and DC chargers and a solar charger). However, if cellphone towers are down, as after a big earthquake or hurricane, they are useless. Satellite phones are very useful for communicating out of the blacked-out disaster area, but very expensive.

When cellphones are down, or even when they aren’t, FM handheld radios are often used for local communica-
Navigation

**Most road and street signs are down.** One out of every ten streets is blocked with debris or flooding. Half of the interstates are closed at one point or another. You have some information about which routes are passable but the information is questionable, and likely only reflects a portion of the closures.

You drive into the disaster area, heading for your assigned rendezvous, using Google Maps. However, when you follow the Google Maps directions, you run into a closed highway. Google Maps gets traffic and construction updates – but as you enter the disaster area, you lose connectivity and this stops working. For that matter, without connectivity, once you reach your destination using the route map that Google Maps automatically saves, you can’t use Google Maps any more.

How do you get to your destination?

Well, if you’re in the know, you used the Google Maps Offline Maps function to save a map of the disaster area before you headed there.

The simple answer is to go back to pre-GPS navigation: map and compass. You did remember to grab a couple of maps of the area, right? Well, you can use a pencil (not a pen) to start marking closed roads on it. This can be ones that you’ve heard about, or ones you discovered yourself. You can then plot a route around the roadblocks and start following it, updating the map as you get more information or discover closed (or occasionally, newly-opened) roads.

A small compass makes a nice complement to your map. When you have no idea where you are, you can use the compass to at least orient the map the right way, making it more likely you’ll figure out where you are. Even if you’re navigating by car, map and compass can work pretty well.

An app called Gaia for iPhone and Android allows you to download detailed topographic maps to your smartphone before you head into the area. Highly recommended, I always do this.

You also need to learn a bit about grid systems, so you can communicate your location, or locations that you’ve been to and that need help, to others. You need to learn about latitude and longitude, the UTM system and its variant the US National Grid system. There are good resources online to learn about these. There is a great reference to the US National Grid System at earth-info.nga.mil/GandG/coordsys/grids/1Sheet_USNGInstruct_v3.pdf.

If you will ever use a GPS, you also need to learn about **datum**. There are competing datums for grid systems, and if your map is set to one and your GPS is set to the other, your positions may not jive for hundreds of meters. Read about this online at Wikipedia.

If you want to learn more about land navigation – and **anyone** who has responded to a disaster thinks they need to learn more about land navigation – I suggest you learn a bit about orienteering, which is the sport of running through the woods while navigating to various checkpoints. The principles you will learn apply equally well to navigating while driving. Search the web for “orienteering” and you should find some good tutorials, or get a book on orienteering from amazon.com or rei.com. Better yet, find a local orienteering club and go out and run (or walk) a few orienteering courses; you’ll acquire a useful skill while having fun.

Travel

**Assuming that you can find a route,** you’ll need to travel to your destination, and likely move from point to point in the disaster area.

If the disaster is far away, you’ll likely go by air. So you’ll need to pack your gear appropriately for air travel, and rolling luggage is great for moving around airports. But sometimes you’ll need to transfer to vehicles, or even travel by foot over terrain where you can’t roll luggage. So experienced disaster responders tend to use a rolling duffel and a pack. The rolling duffel is great for more civilized travel to the area, and if you need to take some gear on a trip in less civilized areas, you can leave the rolling duffel at your base and throw what you need in the pack. I have destroyed multiple rolling duffels, sometimes on a single disaster deployment. I finally got an inordinately-expensive Tumi rolling duffel which has lasted for decades and more than paid back its initial purchase cost. Many opt just for a big backpacking pack. Such a pack will set you back about $150.

If you’ll be traveling across rugged terrain or through
debris – which is likely – you’ll need good foot protection. Federal disaster teams require military-style boots, and you can find fairly good military-style boots (as well as cheap, poorly-designed ones). But if you, unlike me, don’t have to be in uniform, then a pair of good medium-duty hiking boots is ideal. If responding in deep winter, though, you’ll need something warmer. Thickly-insulated winter boots (Sorel and Salomon are good brands, Sorel Conquest is a favorite) are not too expensive ($135 for a good pair and will prevent frostbite.

You will need to break in your boots prior to deployment. This is critical. Blisters on your feet are no joke. I can’t count the number of times disaster responders show up in new boots and then are disabled because after the first couple of days they can barely walk. I would recommend that you walk or hike 30-50 miles in a pair of boots to consider them broken in.

The other thing you need to do is to fit your boots with the proper socks, and make sure you have the proper socks. And fit your boot with those thick winter socks on!

The military have focused a lot of effort on the problem, as it’s so disabling to troops who have to spend a lot of time hiking and walking, especially during boot camp (there’s a reason they call it boot camp!) at Camp LeJeune.

Murray Hamlet, of the US Army Research Institute of Environmental Medicine, in Natick, MA, is the world’s leading expert on a number of things, including the use of yaks in warfare, but we are particularly interested in the fact that he spent years of research, using recruits at Camp LeJeune as guinea pigs, on blisters.

One thing he found (and most outdoorspeople know) is that cotton makes bad socks. Wool is much better, even in the summer. It doesn’t hold water against your foot, and it doesn’t mat down into a hard plate under your foot like cotton, it keeps providing some cushion for your sole. The best as I type this are Darn Tough wool boot socks worn inside out. (Yes, this cuts down on blisters)

There’s more in my essay and table on clothing materials (conovers.org/ftp/Clothing-Materials.pdf).

For more about outdoor survival-type topics, see the Appalachian Search and Rescue Conference’s Essentials for Search and Rescue.

Medical Care

This handout is about self-sufficiency, so I’m not going to be covering the medical supplies and equipment you should take for patient care. That depends on many things: your weight and size limitations, the level of expertise of your medical personnel, and what your particular role will be at the disaster.

But you also need to think about something called force protection. You will need to take care of your own medical needs so you can provide care to others. Federal disaster teams have special kits designed to take care of their own team members; a lot of thought has gone into these kits. A standard Mobile Medical Kit fits into a few 2’x2’x3’ Rubbermaid boxes. Most of this is IV fluids and supplies, diagnostic equipment including BP cuffs, stethoscopes, a pulse ox, an AED, a standard paramedic-style Advanced Life Support drug bag, and airway/intubation gear. But one fairly large pack is the “sick-call kit” and is filled with common medications, mostly oral but some topical medications, eye medications, and common IV medications including antibiotics. Any team planning to deploy to a disaster would do well to emulate such a kit.

You can also argue that, for teams that may be split up into smaller and smaller units (and during disasters, this always seems to happen) that each team member ought to have a personal medical/first-aid kit. The topic of first-aid kit contents always generates much discussion, and the contents should really depend on the member’s personal medical problems, and type of training and expertise. So I’m not going to give specific recommendations. But to get some ideas, you might want to enter conovers.org/ftp in your browser, then look through the listing for PDF files such as “Everyday-Emergency-Kit” and “Daypack Medical Kit” and “Personal Wilderness Medkit.”

One of the problems I always encounter in disaster medical situations is that the light’s no good. Even when I was young and had a sharper eye, this was a problem. Trying to suture a wound when you can’t really see it just doesn’t work. And even if there is someone free to hold a flashlight (almost never), they always get distracted and end up shining it in the wrong place. So the one piece of “medical” equipment that I always carry, unique to disasters, is a good headlight. For about $30, you can get an excellent headlight from REI. Get a Petzl Zipka (shown). It takes 3 AAA cells which fit in the body that straps to your forehead, or a rechargeable lithium-ion battery. Yhe weight on your head is negligible. The light easily fits in your pocket.

Whenever possible, you should use Energizer disposable lithium AAA cells, as lithium cells perform better in the cold, have a longer shelf life, last longer, and weigh less than alkaline cells. They cost roughly twice as much per battery, but they also last roughly twice as long; it ends up costing the same, and you don’t have to change batteries as often.

Altered Standards of Care and Altered Contexts

The phrase “altered standards of care” can excite doctors, lawyers, and legislators. Are hospital staff guilty of manslaughter for the death of patients who could not be evacuated during a disaster? Should hospital staff, like the captain of a ship, go down with the hospital, staying and dying if they can’t get all the patients out to safety?

As fascinating as this subject is, I don’t want to discuss it in a handout on self-sufficiency. I said at the outset that medical care after a disaster is the same as medical care before a disaster. It is, in the sense that the problems are pretty much the same.

However, the context is different, in the sense that you may be confronted with the same problems, but you may have limited resources to diagnose and treat them. Sometimes you may be supplementing staff in a hospital with full capabilities, in which case the context is virtual-
ly the same as your everyday job. Other time, you may be working in a tent, with no X-ray machines and minimal lab testing. Or even in a parking lot with nothing but the pack on your back: what we call a truly austere context.

There is already consensus guidance on altering standards of care for different contexts, at least for the most austere context: in the wilderness. The Wilderness Medical Society publishes consensus guidelines, refined over decades in the journal Wilderness and Environmental Medicine. They lay out how the standard of care is different in the wilderness for a number of common emergencies. There is an old compendium, from before they started publishing separate guidelines in the journal, that covers some things that have not yet been covered in journal articles.

For example, the standard of care “on the street” (where rapid transport to a definitive-care facility is available) for impaled objects is to stabilize in place and transport; in the wilderness it is to attempt removal. In the community, one does CPR until an Advanced Life Support ambulance arrives; in the wilderness one does CPR for half an hour then gives up. This may provide you some guidance in the most austere disaster settings.

More

To learn more, so as to be better mentally prepared to respond to disasters, there are many opportunities. I’ll list things available near my home in southwestern Pennsylvania; you may need to search to find similar opportunities if you live elsewhere.

If you want to get more outdoor experience to prepare yourself for austere deployments, join an outdoor club or wilderness search and rescue team and spend a couple of hours at one of the local REI stores (rei.org) chatting with a knowledgeable member of the sales staff.

If you want to get your ham license and learn more about radio communications, go to arrl.org (American Radio Relay League) and search for ham radio classes near you.

If you want to get experience at managing complex and time-pressured emergency operations, attend some training and respond to a large lost-person search with Allegheny Mountain Rescue Group (amrg.info), or one
How to Read US National Grid (USNG) Coordinates

**Background.** The Federal Geographic Data Committee’s (FGDC) consensus based USNG standard provides a nationally consistent language of location -- optimized for local applications -- for maps, Global Positioning System (GPS) receivers, and mapping web portals. It is an alpha-numeric point reference system overlaid on the Universal Transverse Mercator (UTM) numerical grid. Truncated USNG coordinates (geoadresses) range in precision from 1,000 to 1-meter and provide universal map index values for streets and other features. USNG and Military Grid Reference (MGRS) values are identical when referenced to WGS 84 or NAD 83 datum -- USNG only uses a single 100,000-m Square Identification scheme regardless of datum. This example locates the Jefferson Pier at USNG: 18S UJ 2337 0651.

**Grid Zone Designation (GZD):**

6° x 8° longitude zone / latitude band.

**100,000-m Square Identification:**

Grid Coordinates:

Users determine the required precision. These values represent a point position (southwest corner) for an area of refinement.

Four digits: 23 06 Locating a point within a 1,000-m square.
Six digits: 233 065 Locating a point within a 100-m square.
Eight digits: 2337 0651 Locating a point within a 10-m square.
Ten digits: 23371 06519 Locating a point within a 1-m square.

Only an 8-digit grid is typically required to locate a modest size home out of a local area.

Full USNG: 18S UJ 2337 0651 - World wide unique.
Without Grid Zone Designation (GZD): UJ 2337 0651 - Regional areas.
Without GZD and 100,000-m Square ID: 2337 0651 - Local areas.

**Reading USNG Grid Coordinates.**

- The UTM 10,000 and 1,000 digit values are known as Principal Digits.

- Coordinates are always given as an even number of digits (i.e. 23370651).

- Divide coordinates in half (2337 0651).

  - Read right to grid line 23. Then measure right another 370 meters. (Think 23.37)

  - Read up to grid line 06. Then measure up another 510 meters. (Think 06.51)

**Examples:**

<table>
<thead>
<tr>
<th>Grid:</th>
<th>Examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>228058</td>
<td>FDR Memorial:</td>
</tr>
<tr>
<td>231054</td>
<td>George Mason Memorial:</td>
</tr>
<tr>
<td>2338 0710</td>
<td>Zero Milestone:</td>
</tr>
<tr>
<td>2275 0628</td>
<td>DC War Memorial:</td>
</tr>
<tr>
<td>213017</td>
<td>Ft. Scott Park:</td>
</tr>
</tbody>
</table>

USNG values are formally written as a single string: 18SUJ23370651 or parsed to ease viewing: 18S UJ 233065