Doctors for Disaster Preparedness

A BASIC MEDICAL KIT FOR A 10-20 PERSON SHELTER

compiled by Jane M. Orient, MD, with assistance from many others

Patients often ask what medical supplies they should store. This is a very good question; after a nuclear war it might be easier to find some person with medical knowledge than to locate drugs and supplies. The question is very difficult to answer. Every physician would make a different list.

No physician today would like to be without certain drugs, especially antibiotics. Unfortunately, all drugs are perishable. After the expiration date, they begin to lose their potency, and some (especially tetracycline) may contain toxic byproducts. This means that supplies should be rotated, increasing the cost of this type of "insurance." However, most of us, in a desperate emergency, would use outdated drugs in preference to none at all.

In putting together your own kit, you will need to take your own family's situation into consideration. And you will need the cooperation of your physician for obtaining prescription drugs. Finally, you will need to consider how much you can afford to spend. Do not buy drugs until the basics (food, water, ventilation, shelter, etc.) are provided. Remember that the human race survived for many centuries without modem medicine - but could not survive more than a few days without water.

In constructing this list, various assumptions are made about the situation. One is that major surgery will not be practical under shelter conditions. This requires highly trained personnel and at least $1000 worth of instruments. A person with appendicitis would have a better chance with antibiotics and rest, taking nothing by mouth except medications and clear liquids, than with surgery by amateurs. (In the event of a nationwide disaster such as a nuclear war, our lack of protected hospitals like those that exist in Switzerland would cost lives that might be saved.) Many items could be added to the list. For example, persons who know what to do with them might want to store materials for splinting or casting fractures (which could be splinted by expedient means in the absence of such materials). Intravenous solutions (and the means of administering them) might also be stored. Because of expense, space requirements, and the need for some expertise in their use, they are not listed here.
Wholesale prices (c. 1987), when available, are given in brackets.

DISINFECTANTS

Betadine scrub (1 pt) [$2.70]. Use for cleansing intact skin -- *the detergent is very toxic to tissues.*

Betadine solution (1 pt) [$2.70]. Th*e solution* may be used to cleanse wounds, preferably in a 1:100 dilution (about 3 drops per ounce of water). With dilution, the tissue toxicity is less, and the concentration of free iodine (the antimicrobial agent) is actually greater. Betadine is *not* suitable for water purification. (For that purpose, one can use *tincture* of iodine, which is 2% iodine and 2% sodium iodide in alcohol, at a concentration of 3-5 drops per quart of clear water or 10 drops per quart of cloudy water.)

Chlorine bleach (e.g. Clorox) (a 5.25% solution of sodium hypochlorite)

Dry pool chlorine ("burn out" or "shock treatment") is 65% calcium hypochlorite. A solution of about the same concentration of hypochlorite as commercial bleach can be made by dissolving about 24.5 gm. (about 10 tablespoons) of the powder in 1 gallon of water. CAUTION: The dry

material gives off chlorine gas in small quantities, enough to cause symptoms in some persons. Keep container tightly sealed, and prepare solutions in a well-ventilated area.

Use of hypochlorite for water purification:
volumeclearcloudy 1qt2 drops4 drops 1 gal8 drops16 drops 5 gal1/2 tsp1 tsp
Allow 30 minutes for the chlorine to kill all the microorganisms (see *Nuclear War Survival Skills).*

For cleaning instruments and surfaces, a dilution of 1:10 is recommended. Such solutions are relatively unstable and should be freshly prepared. Scrub off the blood and body fluids (organic materials react with the chlorine and destroy it), then allow the instrument to soak in the disinfectant. *Note that tuberculosis organisms are uniquely resistant to chlorine*
Do not use hypochlorite for irrigating wounds (as was done during World War I), because it dissolves blood clots.

ANTISEPTICS

Acetic acid, 5% (household vinegar, 1 gal). This can reduce the microbial count (especially Pseudomonas) in infected wounds. Half strength vinegar can be used to irrigate the ear in external otitis. Use 3 Tbsp per quart of water as a douche for vaginal infections.

Hydrogen peroxide, 3% solution (1 pt). Some use peroxide to cleanse wounds. It is helpful as a *mouthwash for* oral ulcers or Vincent's angina.

DRESSINGS

- Bandaids (also useful in construction of a Kearny fallout meter (2 boxes)
- Sanitary napkins (1 box) to use as pressure dressings
- Gauze pads (4 by 4 inches, 4 packs of 200 each) [$35.00]
- Conforming gauze roller bandage (4") (12) [$4.70]
- Tape (1 inch, 12 rolls) [$12.35]
- Ace (elastic) bandages (4 inch) (2)
- Safety pins (box of assorted)
- Bedsheet for making triangular bandages, strips as required
- Sewing shears

SURGICAL INSTRUMENTS (FOR MINOR WOUND REPAIRS)

- Iris scissors (1 curved, 1 straight) [$3.75, $3.45]
- Mayo type scissors (one sharp, one rounded blade) [$13.45]
- Needleholder [$4.95]
- Hemostat (Kelly clamp) (2) [$5.80]
- Splinter forceps.
- Tissue forceps with teeth [$2.10]
- Scalpel handle (#3) [$6.95]
- Scalpel blades: (10 each, #10, 11) [$4.70]
- Suture needles, assorted (I dozen 0000 nylon, $13.15]
- Reusable needles obtained from veterinary supplier
- Suture material (catgut from veterinary supplier; cotton and nylon thread)

DIAGNOSTIC EQUIPMENT

- Thermometers
- Sphygmomanometer [$21.75]
- Stethoscope (nurse's) [$4.50]
- Flashlight and extra batteries

OTHER CLINICAL SUPPLIES AND EQUIPMENT

- Latex gloves (box of 100) [$14.95]
- Surgical masks (box of 50) [$13.15]. A mask helps protect against airborne infections and would be of some benefit in preventing inhalation of small particles if one needed to go out of doors in fallout conditions.
- Syringes (1 box of disposable 3-5 cc syringes and/or several of reusable glass; several 1 cc syringes for administering adrenalin) [$11.95/100]
- Assorted needles (21, 25 gauge) [$7.50 per box of 100]
- KY jelly (2 tubes) [$1.90]
- Cotton-tipped applicators
- Baby ear syringe (a rubber bulb useful for suctioning mouth of newborn or for irrigating ears)
- Umbilical clamps (strips of clean cloth can substitute)
- Plastic oral airways of assorted sizes [$4.95]. This simple device can keep unconscious patient from "swallowing his tongue".
- Foley catheter set [kit that includes catheter and drainage bag, $7.50]
- Enema bag
- Notebook, pencils, pens
- Soap
- Measuring spoons
- Dropper bottles
- Plastic bags

OVER THE COUNTER MEDICATIONS

- Acetaminophen (Tylenol) 500-mg "extra strength" (1000 tablets) [$13.90]
- Acetaminophen liquid for children (1 bottle)
- Antacid (1000 aluminum-magnesium hydroxide tablets) [$5.75]
- Antihistamines

    - Chlorpheniramine 4 mg and/or
    - Diphenhydramine (Benadryl) 25 mg (1000 tablets) [$15.65]. Benadryl is also useful for hives, and of some value for nausea.

- Aspirin 300 mg or 10 gr (1000 tablets) [$9.50]
- Kaopectate (Some physicians are skeptical of the value of this time-honored preparation, and recommend Pepto-Bismol instead.)
- Laxatives (200 senoxon tablets and 1000 milk of magnesia tablets) [$4.40, $6.15]. In small amounts, milk of magnesia can also help to replace magnesium lost in chronic diarrhea.
- Petrolatum (vaseline, 1 lb) [$1.80]. This lubricant and emollient is especially good for diaper rash or for making nonadherent dressings.
- Pseudoephedrine 30 mg (1000 tablets) [$7.95].Give one or two tid-qid as a decongestant.
- Tolnaftate powder (Tinactin, 45 gm) [$2.10]. Apply bid-tid for fungal skin infections.
- Zinc oxide (1 lb) [$3.75]. This mild astringent and antiseptic is used in diaper rash and various skin diseases, or as a sunscreen.

<u>From the Grocery Stores</u>

Baking soda is most important for oral fluid replacement -- see below. It has been used as an antacid, though it is certainly not ideal. Persons who need to restrict sodium intake should not take soda for an upset stomach.

Coca-Coca syrup [$6.50/gallon]. One consultant suggested this as being surprisingly effective for nausea and vomiting.

POTASSIUM IODIDE

To block thyroid gland to prevent uptake of radioactive iodine contaminating food and water, take 4 drops of a saturated solution daily. (Fill a brown dropper bottle about 60% full with crystals, then add water until bottle is 90% full. Shake. Check to be sure that some crystals remain out of solution. See Nuclear War Survival Skills p. 114.)

PRESCPTION DRUGS

The following is not intended as a self-treatment guide, but as a guide to choosing drugs for storage. Always seek medical advice before using these potent drugs, all of which have potentially serious side effects, including death. Antibiotics should not be used when they are ineffective and unnecessary (as in viral infections) because of side effects and the risk of selecting out resistant bacteria.

For guidance in determining quantities, the usual duration of treatment for an episode of illness is about 10 days. Adult dosages are given unless otherwise indicated. Abbreviations: bid=twice a day; tid=three times daily; qid=four times daily.

Do not take outdated tetracycline, as kidney damage may result
Always ask the patient whether he is allergic to the drug. If he has a history of hives (an itchy skin rash) or wheezing or swelling in the mouth or *throat, do not give the medication, as a fatal reaction may occur.*

Antibiotics

Penicillin V 500 mg (1000 tablets) [$48.50]. Give 500 mg qid for Streptococcal, pneumococcal infections, anaerobic infections "above the diaphragm" such as abscessed teeth. Although its spectrum is limited, this drug is relatively cheap and causes fewer side effects such as diarrhea and vaginitis. Unfortunately, streptococci and pneumococci are increasingly resistant.

Amoxicillin 250 mg (500 capsules) [$40.75]. Give 250 to 500 mg id for urinary, middle ear, and lower respiratory infection. This is a broader spectrum penicillin. Staphylococci are usually resistant.

Ampicillin or amoxicillin for oral suspension 250 mg/tsp (60 doses) [$15.40]. The suspension is for children who cannot swallow amoxicillin capsules. Give 1/2 to 1 tsp qid, depending on the size of the child.

Erythromycin ethylsuccinate 400 mg (500 tablets) [$69.35]. Give two tablets bid for pneumonia or Streptococcal sore throat. The drug is also of some benefit in Staphylococcal skin infections.
Tetracycline 250 mg (1000 capsules) [$17.70]. Give 250-500 mg qid for plague and various other insect-born infections; urinary infections; bronchitis; infected animal bites; some venereal diseases; Rocky Mountain spotted fever. Avoid this class of drug in pregnant women and young children, if possible.

A more expensive drug in this class is doxycycline 100 mg, which is given once daily (twice for severe infections). Doxycycline has fewer gastrointestinal side effects and is better absorbed than tetracycline with food in the stomach, but is more likely to sensitize the skin to sunlight. [Cost is $47 for 500 100-mg tablets; for the higher doses that is $0.18 per day vs. $0.14 per day for tetracycline.]

Oxytetracycline for intramuscular injection (250 cc, 200 mg/cc) [$24.50 from veterinary supplier]. The dose is about 500 mg bid for severe, life-threatening infections, or 100 mg tid for mild infections, in which case oral treatment is probably preferable. The injectable form may be necessary in patients too ill to take oral medications or for illnesses like plague or anthrax which may be fatal before oral medication is absorbed. Intramuscular injection causes pain; a local anesthetic may be given simultaneously.

Metronidazole (Flagyl) 250 mg (500 tablets) [$21.80]. The usual dose is 500 mg tid, higher for some infections (e.g. amebiasis). The drug is effective against certain protozoans including amoebae and Giardia, and for anaerobic bacteria such as those that normally inhabit the bowel and the female genital tract. It can be extremely useful in intraabdominal , pelvic, and wound infections caused by such bacteria.

Chloramphenicol. The dose is 500 gm qid for anaerobic infections; typhoid and other Salmonella infections; psittacosis; rickettsial infections; or meningitis due to Hemophilus or Meningococcus. This drug is very well absorbed from the gastrointestinal tract and penetrates well into the cerebrospinal fluid (hence its value in meningitis). However, it causes fatal aplastic anemia in about 1 in 50,000 persons treated with it, and some drug companies have stopped manufacturing it.

Trimethoprim-sulfamethoxazole DS (Bactrim, Septra) (500 tablets) [$41.15]. Give one double strength (DS) tablet bid for urinary infections and some types of bacterial diarrhea, or as a back-up drug for sinusitis, bronchitis, ear infections (for resistant organisms or allergic patients). Others: Some excellent broader-spectrum drugs, especially amicillin with clavulanic acid (Augmentin), cefuroxime (Ceftin), and ciprofloxacin are not included solely because of expense.

For allergic reactions and asthma

Adrenalin (epinephrine) for injection (30 cc vial) [$5.55]. Give 0.1 to 0.5 cc of a 1:1000 solution subcutaneously for acute anaphylaxis from a drug or other allergy such as bee sting, or for a severe asthma attack.

Prednisone 5 mg (1000 tablets) [$11.25]. The dosage is variable, usually starting with 40 to 60 mg, tapering as rapidly as possible. Prednisone is used for *severe* cases of asthma, poison ivy, sunburn, and allergic reactions, but is not a substitute for epinephrine because the response is not sufficiently rapid. Use with great caution because steroids depress the immune response, among other side effects; however, the drug can be life-saving.

Theophylline preparation (Theodrine 1000 tablets) [$10.95]. Give 100-3100 mg tid or qid, for asthma. Combinations with ephedrine (such as Theodrine), while out of favor these days, may be much cheaper. Theophylline is being used much less often. Tea contains a little theophylline. Alupent inhaler [$15.65]. In asthma or acute allergic reaction with wheezing, this has a more rapid action than theophylline.

For nausea and vomiting

Prochlorperazine (Compazine) 25 mg (100 tablets) [$10.75]. Often used for nausea and vomiting, this drug also may be of some value in acute psychosis. One consultant recommended promethazine (Phenergan) 50 mg instead [$9.00/1000]. Phenergan does not have the additional indication for therapy of psychotic disorders.

For Psychologic distress

Phenobarbitol 60 mg (300 tablets) [$11.55]. 30-60 mg is useful as a sedative. The usual anticonvulsant dose is 90 mg daily. CAUTION: Barbiturate addiction is very dangerous; fatal withdrawal reactions have occurred.

Haldol (15 cc vial, 2 mg/cc) [$16.35]. Start with 1 mg intramuscularly for otherwise unmanageable acute psychotic reactions. *Monitor the blood pressure.*

For Pain

Xylocaine 1 or 2% (two 50-cc vials) [$6.50]. For local anesthesia.

Acetaminophen with codeine 60 mg (1000 tablets equivalent to Tylenol #4) [$44.05]. Codeine is both cheaper and more effective for pain relief in combination with acetaminophen (or aspirin). It also relieves severe cough.

Proparicaine ophthalmic solution 0.5% (2cc) [$2.25]. 1 to 2 drops will anesthetize the cornea of a patient with a foreign body in his eye. *Use only once to enable you to remove the foreign body. Continued use may allow severe damage to the eye to occur without the patient's awareness.*

Nalbuphine hydrochloride (Nubain) (two 10-cc vials, 20 mg/cc) [$29.90]. 10 mg intramuscularly, or more, relieves severe pain. This drug is considered to have less potential for abuse than morphine because it is also a narcotic antagonist (that is, it will cause acute withdrawal in an addict).

For heart and blood pressure

Hydrochlorthiazide 50 mg (1000 tablets) [S6.80]. One tablet daily helps to control, high blood pressure or congestive heart failure.

Nitroglycerin 11150 gr (200 tablets) [$6.30]. One under the tongue as needed relieves angina (heart pain).

Lanoxin (digoxin) 0.25 mg (100 tablets) [$9.10]. Use under physician's advice for certain cardiac conditions such as congestive heart failure or atrial fibrillation with rapid heart rate. The usual maintenance dose is one tablet per day or 1/2 tablet in the elderly.

Atropine 0.5 mg/cc (30 cc) [$1.35]. Because it speeds the heart rate, this drug is useful in some heart attack victims if they have a profound decrease in pulse. More importantly, it is an antidote to many poisons (such as organophosphate insecticides, some poisonous mushrooms, and chemical warfare agents such as tabun and sarin).

Miscellaneous

A year's supply of any prescription drug needed by a family member. Rotate each year. This is especially important for drugs with a short shelf life, such as insulin. (Insulin lasts about six months at room temperature, but for only two to six weeks at 80 degrees F.)

Immunizations, especially tetanus, should always be kept current. (Tetanus toxoid should be given every ten years. For dirty wounds, a booster may be given if the last dose was more than five years prior to the injury.)

ORAL FLUID REPLACEMENT

Burns

Slightly rounded teaspoon of salt in one qt of water (the equivalent of half-normal, i.e. 0.45%, saline). Have victim drink 4 to 8 quarts in first 8 hours (sipping slowly), 4 to 8 qts in the next 16 hours, then as dictated by thirst.

Cholera or other severe diarrheal illness

To one qt: of water add scant tsp Lite-Salt (a mixture of sodium and potassium chloride); 10 tsp, sugar; 1/3 tsp sodium bicarbonate. (The Russians use activated charcoal to absorb toxins.)

BOOKS

Cain, Harvey, ed. *Emergency Treatment and Management,* 7th ed, WB Saunders, 1985 (indispensable).

Emergency War Surgery (First US revision of *The Emergency War Surgery NATO Handbook),* Desert Publications, Comville, AZ 86325.

Kearny, Cresson. *Nuclear War Survival Skills* (indispensable).

Lindsey, Douglas. *Simple Surgical Emergencies.* Arco Publishing, New York, 1983 (simple wisdom from the ER front lines).

Physician's Desk Reference. This is a compendium of package inserts from various drugs. It is not the best book for learning about drugs, but doctors get a free copy every year, courtesy of pharmaceutical companies. Your doctor might be willing to give you an old one.

Sanford, Jay P. *Guide to Antimicrobial Therapy 1988.* Order from www.sanfordguide.com.

Werner, David. *97tere 7here Is No Doctor A Village Health Care Handbook.* The Hesperian Foundation, PO Box 1692, Palo Alto, CA 94302. (the basics--including how to give an injection, how to treat some dislocations and fractures, the use of common drugs, and assisting at a normal delivery).

Wilkerson, James A. *Medicine for Mountaineering.* The Mountaineers, Seattle, Washington, 1985.

A Merck Manual and/or a copy of *Current Therapy* (the latter comes out every year so check the used bookstore).

A textbook of medicine, such as Harrison's Principles of *Internal Medicine* or Beeson-McDermott *Textbook of Medicine,* a textbook of obstetrics, such as Williams *Obstetrics,* and a pediatrics textbook are also helpful. (Again check the used bookstore.)