



## Doc Blue's Emergency Medical Kit

*Do you carry a first aid kit in your airplane or car? According to AVweb's Brent Blue M.D., first aid kits of the drugstore variety are mostly packed with stuff that is totally useless and occasionally harmful. Over the years, Dr. Blue has assembled his own traveling medical kit for dealing with on-the-road emergencies, based on his long experience as an emergency room doc, frequent traveler, pilot, outdoorsman, and dad. He offers details of exactly what's in his kit, why each item is there, and how to assemble a really good kit of your own.*

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One of the things that has always driven me crazy about the commercial first aid kits that you find in drugstores and pilot supply catalogs is that they're filled with crap that is totally useless ... and sometimes even harmful. Never one to be soft-spoken or unopinionated, I have tried to make my feelings known

(vigorously) to various manufacturers of first aid kits, only to be ignored.

Even high-priced aviation-oriented medical kits aren't well thought out, in my judgment. Let me give you an example. [MedAire, Inc.](#) is a company that specializes in providing medical services to airlines and corporate flight departments, training their in-flight personnel and providing emergency "telemedicine" consultation by radio or flight phone in the event of medical emergencies aloft. MedAire offers a series of [very elaborate and expensive medical kits](#) to their airline and bizjet customers. Each of these kits includes a blood pressure cuff and stethoscope. Now that might sound like a good thing to have along, but in my opinion they don't belong in a first aid kit, especially one intended for use by non-medical personnel. Not only are these items bulky and expensive, but they really don't serve a good purpose.

Remember that first aid kits are strictly for first aid in medical emergencies, not for ongoing evaluation of medical conditions. In an emergency, it's not important to know a person's precise blood pressure -- all that's important is whether it's high, normal or low. If



you can feel a pulse in the wrist or groin, the systolic pressure (top number) is at least 90, which is adequate. If the pulse can only be felt in the neck and not in the wrist or groin, the pressure is low -- probably in the 60 to 80 range (systolic). On the other hand, if a pulse is visible in the temple area or are very strong in the wrist -- and especially if accompanied by headache -- blood pressure is probably high. For first aid purposes, a general determination of B.P. as being high, normal or low is all that is needed. You don't need a sphygmomanometer and stethoscope for that.



Another problem I have with most first aid kits is that they contain too much special-purpose stuff and not enough multi-purpose stuff. The folks who design them apparently assume that the user cannot be creative. When I help mountain climbers create medical kits for climbs in the third world, I know that weight and space are at a premium, so I try to give them medications and other items which can be used to deal with multiple problems. For instance, acetaminophen (Tylenol) with codeine is great to treat pain, but is also good remedy for diarrhea, cough, headache and insomnia. Another example: antibiotic eye drops can be used in the ear, but eardrops cannot be used in the eye.



Yet another complaint I have about most first aid kits is the way they're packaged -- typically in a plastic or metal hinged-lid box that requires the user to dump most or all of the contents out to find a needed item. This makes the kits difficult to use, which in turn causes people to avoid using them in anything but the most dire emergency. If you carry a first aid kit in your car or airplane or boat or backpack, think about when the last time was that you actually opened the kit and made use of the contents. For most people, the answer is "a long time ago" or "never." To my way of thinking, a medical kit should be designed to be useful and user-friendly, not a "break glass in case of emergency" affair.

With these concepts in mind, I have developed a first aid kit for my own use which cuts out all the B.S. and contains a host of useful items, most of which can be used for a multitude of purposes. It's not the cheapest kit (we'll talk about cost later), but it includes stuff one is most likely to actually need, and I've tried to include the best and most useful items available, packaged in a fashion that makes the kit truly useful.

## What I Carry, and Why

Let me go over the key stuff I carry in my kit, and explain why I selected each item:

### **Band-Aid-type adhesive bandages**

First, let me admit that I am not a big fan of Band-Aid-type strips. They occlude the wound and make it gooey. You know that white, wrinkly skin you find

under a Band-Aid? The medical term for that is "maceration," and it not only impedes healing but also promotes infections.

But it's hard to fight all that Johnson & Johnson advertising money. Seriously, adhesive bandage strips are great for bleeding wounds in order to stop the bleeding, but I recommend that the strips be removed after a few hours ... or immediately if they get wet. I prefer the fabric stretchy adhesive strip, particularly for fingertips and knuckles, but the straight ones are great too. Most kits just don't include enough. Mine has a lot.

### **Band-Aid decorated spots and strips**

Okay, these are pretty useless, too, but I have a four-year-old son. Regardless of the situation, a decorated strip or spot can cure a crying attack faster than an ice cream cone, and you can't store ice cream in a first-aid kit (except for the freeze-dried stuff the astronauts have never taken into space).

### **Rubber gloves**

Conventional rubber gloves have their place, but I would not necessarily use them on my family. Paramedics around the country use the blue ones because they do not tear as easily. These blue gloves are so good that I know paramedics who buy their own when their employers are too cheap to provide them. They also can be used to carry water in a survival situation, and as a tourniquet.

### **SAM splint**

Splints do several things. They provide a firm material that can be used on broken arms or legs. The purpose of splinting an injured extremity is threefold: to reduce bleeding, to decrease pain, and to reduce further injury. The splint material I use can be bent easily, can be reused, and does not age quickly. The SAM has detailed usage instructions rolled up with it, but in general the splint should be unrolled, doubled and curved around the extremity. Curving the splint material provides a great deal of rigidity and strength. The splint can be applied to the injured extremity with tape or gauze, or tied on with triangular bandages secured with knots. Upper extremities should also be put in a sling with a triangular bandage after splinting ... the more elevation, the better.



*My personal medical kit is packaged in a professional-grade Cordura EMT bag.*



*The bag contains lots of zippered compartments...*



*...plus 14 clear plastic zip-lock pouches.*

## Provoidine liquid

God, I love provoidine solution. Basically, Provoidine sterilizes everything on contact. It is great for cleaning abrasions (it does not sting like regular iodine) and sterilizing wounds. Any situation where a wound has occurred deserved to be wiped off with provoidine.

I first saw it used (later proven counterproductive) by the Chief of Surgery at my medical school (I am not telling which one). The surgeon mixed the brown solution with peroxide and poured it into the belly of patients who had infections in their abdomen. He called it "brown and bubbly." You should have seen this combo start to bubble out of a belly wound. Looked like Old Faithful or Mount Saint Helens erupting!

## Waterless soap

Antibacterial waterless soap is the best for prepping the hands for working with wounds or any other situation for sterilizing the skin.

## Hand cleaner/prep pads

These are saturated with benzyl ammonia and packaged in individual tear-open packets. They're non-sticky and do not require rinsing to clean up hands. I find them good for everything from cleaning the relief tube to getting ready for dinner, but they're really great for washing off solid or liquid contaminants on the hands or skin.

## Small towels

Several pilot friends recommended towels. They do come in very handy for all sorts of situations, and take minimal space. I use disposable ones.

## Earplugs

Earplugs are important. Hearing loss from loud sound is cumulative, and those of us from the rock-crazed 60s already have problems. Headphones are okay for flying, but there are lots of times on the tarmac that earplugs come in handy. They are also good for passengers (especially infants and small kids) who do not have headsets or do not want to wear them. They



*The pouches detach easily.*



*Kit contents -- click for larger image.*

also work great if you get stuck in a hotel room with a snoring copilot.

### **Antacid chewable tablets**

These tablets can be lifesavers when dietary indiscretions get the best of you. Although the liquid is more effective, the tablets store better and do not spill. Two at a time is the minimum dose, and can be used as frequently as necessary.

### **Throat lozenges (eucalyptus or menthol)**

These help with minor sore throats and coughs. Although they provide symptomatic help only, this medication can really improve a sick person's disposition.

### **Hydrocortisone cream**

Now available over-the-counter without prescription, hydrocortisone cream is the best remedy available for dry skin, irritation, and most scaly rashes. It's particularly good for contact dermatitis such as poison ivy or poison oak. A small amount applied frequently works best -- you do not need to goop it on.

### **Suntan lotion**

The water-based children's type is our favorite, since it doesn't tend to blind you when you start to sweat and it drips into your eyes.

### **Mosquito Repellent**

Citronella-based repellent is the best. It is non-toxic to children, smells okay, and won't melt plastic like DEET (which is also toxic to children). Citronella has one huge advantage in addition: It repels flies and other biting insects besides mosquitoes that DEET does not.

### **Ibuprofen (Advil, Motrin)**

Ibuprofen is one of the truly great drugs developed since aspirin, and is part of a drug family known as NSAIDs -- non-steroidal anti-inflammatory drugs. Non-prescription dose is 400 mg (two tablets) every six hours, while the prescription strength is 800 mg (four tablets) every six hours. It is useful for headaches, sunburn, pain, muscle aches, and general soreness. The only downside is that it can cause stomach upset, so it should be taken with food.

### **Acetaminophen (Tylenol)**

The acetaminophen dose for adults is 1000 mg every four hours for fever and pain. Acetaminophen differs from aspirin and ibuprofen in that it has no anti-inflammatory effect, but is much easier on the



*The kit can be carried...*

stomach.

## Aspirin

Aspirin is similar in effect to ibuprofen, and has similar stomach side effects. Dose is two to three 325 mg tablets every four hours for fever, arthritis, headache, or other pain.

## Tee Tree Oil

Doug Ritter of [Equipped To Survive®](#) turned me on to this stuff. It is the best thing I have found for insect bites (stinging ants, bees, mosquitoes, etc.). The thick stuff should be dabbed (not rubbed) on the site on an "as necessary" basis. It also works well for minor burns almost eliminating the pain immediately. Friends have reported to me that it also works well as an anti-fungal to relieve athlete's foot and ringworm.

## Non-adhering dressing

If you have to cover a wound, this is probably the stuff you want to use. The Telfa pad supposedly keeps it from sticking, but sometimes you have to soak it off a crusted wound.

## Unstarched roll gauze

This unstarched gauze is great for wrapping large wounds. It is not elastic so it will not go on too tight (unintentionally). It conforms to the area it is placed and tends to stay there.

## Cohesive compression bandage

Although this stuff looks like an Ace bandage, it is not. The material sticks to itself, is waterproof, and can be reused to some extent. It's great for wrapping wounds, especially over unstarched gauze, and eliminates the need for securing clips or tape. It's important to note that it is elastic, so take care not to wrap it so tight that it impedes circulation. Although it's intended for dressings, it's also perfect for splint applications, creating a makeshift sling, and all sorts other uses. Think of it as the duct tape of first aid kits.

## Ace elastic bandages

Ace bandages are for general support of joints and for compression dressings. Support of ankles, knees, wrists, and elbows are the most frequent use, but Ace bandages can also be used with gauze pads and or unstarched gauze rolls for keeping a wound from bleeding. Ace elastic wraps can be dangerous if wrapped too tight, causing a tourniquet effect and cutting off circulation. If used to stop bleeding, an Ace bandage must be loosened periodically (every 30 minutes is fine) until bleeding is controlled, and then reapplied less tightly for gentle pressure. They can be washed, re-rolled, and reused.



*...or strapped on fanny-pack style.*

## **Gauze pads**

Gauze pads are good for cleaning and dressing wounds, and are better than plain cotton dressings since they do not leave fibers in the wound. They're also great for applying proviodine, etc.

## **Tape (zinc and plastic)**

Zinc tape is more conforming, but plastic tape does not absorb water. Only experience with use will help you decide which tape is the best for each job. I carry a roll of each in my medical kit.

## **Mastisol tape-skin adhesive**

This stuff is the Crazy Glue of first aid kits. Put this on the skin and tape will stick forever, even in water! Great for steri-strips (see below).

## **Steri-strips**

Steri-strips are modern day butterfly bandages. They will aid closing and/or keeping a wound closed (especially when used with Mastisol). However, I have concerns about putting steri-strips into a first aid kit, because wounds are very difficult to keep sterile when closed in the field. It is essential to remember this caveat: Open wounds rarely get infected, and when they do it is usually minor. Closing a wound, however, creates the potential for an abscess and blood poisoning that can create a disaster. The scarring from a wound that is not closed might be greater than one that is closed, but that can be dealt with later by a plastic surgeon. Blood poisoning or abscess formation while camping can be lethal, especially if it occurs in a survival situation or a third-world country. In most cases, it's better to leave the wound open.

General wound care should start with cleaning with soap and lots of water. Painting with proviodine completes the cleaning. If soap and water are not readily available, irrigating with the proviodine is best alternative. For a dressing, I am personally fond of using gauze lightly wetted with proviodine directly on the wound, with a layer of dry gauze on top -- a so-called proviodine wet-to-dry dressing. A few studies have shown proviodine to be irritating and destructive to live cells, but my personal experience is that the wet-to-dry dressing works extremely well for sterilizing wounds and preventing infections.

## **Triangular Bandages**

There are good for making slings and tying extremities to splint material for stabilization. They can also be used as a tourniquet as a last resort for uncontrollable bleeding.

## **Mosquito hemostat with fine nose**

These are the surgical equivalent of needle-nose pliers, but made of springy steel alloy and with a self-locking feature. They are great for removing splinters, fishhooks, and a variety of other missions.

## **Bandage scissors**

These are small scissors with one blunt blade, allowing bandages to be cut off without injuring the bandage. (I also carry a Robin Safety Boy Rescue Cutter for heavy-duty jobs like cutting seatbelts and breaking out windows, but it's too big and heavy to include inside the medical kit, and should be stored within easy reach in the event of a crash.)

## **Diphenhydramine 25 mg chewable (Benadryl)**

Benadryl is good for allergic reactions, itching, and insomnia. Adult dose is one or two tablets every six hours, or half that for children.

## **Sterile needles**

I carry several hollow bevel-point hypodermic-type needles in my kit. They're the best thing I've found for digging out small splinters and making small incisions. They're not recommended for draining abscesses, since a needle-punctured abscess will reseal and form again. (An abscess should be lanced with a scalpel blade.)

## **Scalpel blade**

This is incredibly sharp, good for large splinters and incising (making a large cut in) an abscess for drainage. Also good for cutting thread. The blade can be clamped in the hemostat.

## **Dimenhydrinate (Dramamine)**

Dramamine works as well as any other over-the-counter drug for motion sickness (which is not particularly well). The tablets are chewable and the dose is on the packet. (The [ReliefBand](#) provides far more predictable and effective relief for most people.)

## **Zip-Lock bags**

These are good for everything from transporting water to ice packs to disposing of used dressing material. They have zillions of uses, and are invaluable.

## **Safety pins**

Used to secure triangular bandages, replacing lost buttons, and a variety of other useful applications.

## **Folding paper cups**

I find them handy.

## **Cotton-tip applicators (Q-Tips)**

These applicators can be used to apply medications, clean the external part of the ear, cleanse wounds, and remove foreign bodies from the eye.

## **Moleskin**

This stuff is used to protect the feet and take pressure off of blisters. Self-adhesive, but best used with Mastisol. To take pressure off a sore area of the foot, cut Moleskin in the shape of a donut with the central hole slightly bigger than the blister or other lesion.

## **Instant ice**



These chemical cold-packs can be used on a contusion, sprain, strain, or other traumatic injury. The cold reduces bleeding and swelling. They will not last long, but will help immediately and are better than nothing while you find some ice. Heat should not be applied for 72 hours.

### **Eye wash**

Use this for washing out contaminants (battery acid, chemicals, dirt, etc.) from the eye. The eye must be held open for this to work.

### **Electrolyte powder**

This is particularly good for fluid replacement for diarrhea, and for treating dehydration due to heat exhaustion or heatstroke. Plain water is next best choice. Remember that hot dry climates may precipitate dehydration more suddenly than you might expect. My physiologic rule is that if you are drinking enough to have to urinate every three hours, your tank is full.

### **Liquid tears**

Good lubrication for irritated eyes of any cause. Not for washing out a foreign body or chemical unless nothing else is available. Eye wash or even plain water is better for irrigation of contamination.

### **Lip balm**

Always handy for routine use.

### **Trash bags**

Good for everything from trash to holding ice for ice packs.

### **Sanitary napkins**

Also can be used for holding pressure on bleeding wounds.

### **Tongue depressors**

Can be used as finger splints, looking down the throat, or toys for kids. Can supplement large splints.

### **Urine/puke bag**

The [#1 TravelJohn](#) is the best of the products we have tested. The internal polymer absorbent material gels any liquid, making it spill-proof, and neutralizes odor. These cannot be used for water storage or transport because it cannot be recovered from the gel. Can be used for ice or cool packs when placed in a freezer or filled with cold water.

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## **How I Package My Medical Kit**

To my way of thinking, packaging of a medical kit is

almost as important as what it contains. The contents do you no good if you can't find what you need when you need it. Furthermore, a kit that is a pain to unpack and repack is unlikely to be used very often. My kit is designed for frequent use and rough handling. I take it wherever I go -- flying, hiking, skiing, camping at Oshkosh -- and use it often.

After surveying a wide range of boxes and bags, I finally settled on a professional-quality urethane-coated Dupont Cordura bag manufactured by [Nocora, Inc.](#), of Pinedale, Wyoming. Nocora builds these bags specifically for Emergency Medical Technicians. They're extremely rugged, bristling with carefully-organized zipper pockets, and with more than a dozen rugged clear-plastic zip-lock-type pouches specifically designed to secure and organize medical items in a logical and easy-to-find fashion. It can be carried or strapped on and worn as a fanny-pack. As you might imagine, packaging like this is not cheap (the Nocora bag costs close to \$100), but it makes all the difference between a truly usable medical kit and one that sits unused year after year.



***This Cordura EMT bag is rugged, and organizes all the contents in a logical, easy-to-find and easy-to-use fashion. It's expensive, but worth it. (Click on photo for larger image.)***

If you carry a first aid kit in your car or airplane, it's also important to make sure it's mounted in a location that's easy to access in the event of an accident. You should also check your kit periodically for replacement of used or depleted supplies. Most of the medications I carry are long-lived, but a few expire and should be replaced periodically.

## Assembling Your Own Medical Kit

To assist you in putting together your own medical kit, here's a detailed listing of exactly what I carry in mine:

Item	Qty	Where It Goes
1"x3" Woven (Swift Brand)	30	Bag Set #7
3" Cotton Tip Applicators Sterile 2's	30	Bag Set #5
3"x4" Non-Ad Pad	5	Bag Set #6
4x4 Gauze	40	Bag Set #6
7/8" Plastic Spot (Swift Brand)	30	Bag Set #7
Arizona Sun SPF 30 1oz	1	Elastic Loops
Aypanal Extra Strength (Acetaminophen) 2's	32	Bag Set #5
Benadryl Caps 25mg	24	Bag Set #2
Betadine Pads	20	Bag Set #1
Betadine Solution 1/2oz	2	Elastic Loops
Blistex	1	Elastic Loops
Buffered Aspirin 2'S	32	Bag Set #4
Cedaprin (Ibuprofen) 200mg 2's	32	Bag Set #4

Character Strips 3/4"x3"	30	Bag Set #7
Co-Flex 3"	1	Interior Zipper Pocket #1
Cold Pack	2	Interior Zipper Pocket #2
Cough Drops Menthol Eucalyptus	24	Bag Set #3
Dermicel Tape 1"	2	Exterior Zipper Pocket #1
Dermicel Tape 2"	1	Exterior Zipper Pocket #1
Dramamine	1	Bag Set #3
Ear Plugs Max (NRR 33) Pr's	4	Bag Set #3
Elastic Bandage 2"	1	Interior Zipper Pocket #1
Elastic Bandage 4"	1	Interior Zipper Pocket #1
Elastic Bandage 6"	1	Exterior Zipper Pocket #1
Electrolyte Tablets	32	Bag Set #2
Eye Wash 4oz	1	Exterior Zipper Pocket #3
Fingertip "8" Woven (Swift Brand)	30	Bag Set #7
First Aid Book	1	Bag Set #6
Flexicon 2"	2	Interior Zipper Pocket #3
Flexicon 4"	2	Interior Zipper Pocket #3
Flexicon 6"	2	Interior Zipper Pocket #3
Folding Paper Cups		
Gloves Nitrile (Blue) Large PR's	2	Belt Wings
Golf Towels ultra Compressed		
Hydrocortisone 1% Foil Pack	5	Bag Set #8
Imodium AD	1	Bag Set #5
Kleenex	2	Bag Set #5
Knuckle Woven (Swift Brand)	30	Bag Set #7
Kotex Maxi Pads (Individually Wrapped)	2	Bag Set #6
Liquid Children's Tylenol 2oz	1	Exterior Zipper Pocket #3
Mastisol	4	Bag Set #8
Moleskin 4"x12"	1	Bag Set #6
Mosquito Hemostat 4"	1	Velcro Keeper
Natrapel (deet free repellent) 2oz	1	Elastic Loops
Nu-Tears 1/2oz	1	Elastic Loops
Pepto Bismol Tablets	48	Bag Set #2
Porous Cloth Tape 1"	2	Exterior Zipper Pocket #1
Porous Cloth Tape 2"	1	Exterior Zipper Pocket #1
Safety Pins Assorted	1	Bag Set #3
Sam Splint	1	Exterior Zipper Pocket #2
Scalpel Blade #10	3	Bag Set #1
Small EMT Shears	1	Velcro Keeper
Steri-strips 1/4x1-1/2 (Envelope of 6)	1	Bag Set #8
Steri-strips 1/4x3 (Envelope of 3)	1	Bag Set #8

Steri-strips 1/8x3 (Envelope of 5)	1 Bag Set #8
Sterile Needles 18gauge	3 Elastic Loops
Tampons	2 Bag Set #6
Tee Tree Oil (Burn Away)	1 Elastic Loops
Tongue Blade (non-sterile) 3/4" x 6"	15 Bag Set #5
Trash Bags 20qt	4 Top Slip Pocket
Triangle Bandage	3 Interior Zipper Pocket #1
Urine/puke bag (#1 Travel John)	1 Exterior Zipper Pocket #2
Vacuum Packed Wash Cloths	
Vionex No Rinse Jell 4oz	1 Exterior Zipper Pocket #3
Wash Up Towelettes	30 Bag Set #1
Zip Lock Bags 12" x 15"	2 Bottom Slip Pocket

In preparing this article, I tried to price out what all this stuff would cost if you bought it at retail (including the fancy bag, but excluding a few hard-to-find or physician-only items), and came up with a total of a bit over \$500. You could obviously shave a little off that figure by reducing the quantities, and shave a fair amount off by using less sophisticated packaging than the \$100 Cordura EMT bag that I chose. Basically, you get what you pay for.

**NOTE:** For those who may be interested, I've made up some medical kits substantially identical to the one I use (including the fancy Cordura bag), and made them available on the [Aeromedix.com Web site](http://Aeromedix.com) for \$350. (As an emergency room doc, I can buy most of the stuff in the kit in bulk and/or at discount.) If you're interested in one of these kits, you can [order it online](http://Aeromedix.com) or phone Aeromedix.com at 888-362-7123.



## ***About the author...***

*Brent Blue M.D. is a Senior Aviation Medical Examiner and was the physician for the U.S. Acrobatic Team at the World Competition in 1994. He serves as AVweb's aviation medicine editor, and is also on the EAA's Aeromedical Council.*

