



**Personal Wilderness Medkit Version 1.1<sup>1</sup>**

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**I. Principles**

**A. Durable:** Must be able to last a long time despite abuse

1. Must be able to withstand mechanical trauma: crushing, drop shocks
2. Must be able to withstand temperature extremes
3. Must be usable despite occasional outdated medications
4. Must be **waterproof<sup>2</sup>**

**B. Flexible:**

1. Must be able to handle most common or serious problems with combinations of equipment and medications
2. Must be usable for dogs and horses
3. Medications must have multiple uses
4. Must be able to separate into smaller modules for short tasks, so as not to have to carry entire kit on every task, especially if it is a "bash" team trying to get into a patient as quickly as possible<sup>3</sup>
5. Must be adequate for mutual aid requests to other regions (i.e., must carry medications for high altitude illness, even for cave rescue personnel)

**C. Simple and Small:** must be light and compact<sup>4</sup>

**D. Extensive Enough:**

1. providers should have enough medication to start treatment for common problems in the field, then to get home, get an appointment with their family doctor, and have the condition re-evaluated, a minimum of 3 days
2. can add medications from the team medical kit for known conditions of patient, e.g., phenytoin, insulin

**E. Inexpensive:** prehospital personnel must purchase medications with own money (SAR teams can't afford to provide medications) so medications must not be too expensive

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<sup>1</sup>This version contains a section on Principles and many explanatory footnotes. A "pocket" version with none of these additions is also available.

<sup>2</sup>This document will not specify how to pack and store the medical kit. It is up to SAR teams or individual medics to establish packaging suitable for their own environment and uses. A companion document with ideas for packaging will be produced at some point.

<sup>3</sup>Selections for these modules are based on most common task lengths in the WEMSI primary service area.

<sup>4</sup>1.1.> We had considered adding an ampule of 50% dextrose to the kit. But, it is very heavy, and in almost all cases, one can get some oral glucose in any hypoglycemic patient in the wilderness. For that matter, instant glucose test strips weigh very little; however, they have to be kept in an airtight container that is fairly large, and have a short shelf life when exposed to heat (as in a pack or car in the summer). Since almost all wilderness patients need glucose or food calories, we did not include glucose test strips in the kit.



**F. Safe:**

1. Must contain instructions on safe use of medications<sup>5</sup>
2. Should not contain medications that are unsafe after exposure to environmental extremes, or if outdated

**G. Accountability and Security:**

1. Must meet DEA requirements for controlled drugs:
  - a) Dispensing to individual Wilderness EMTs
  - b) Logging distribution
  - c) Logging use
2. Must be kept secure, as much as possible during wilderness travel (small, lightweight travel lock on nylon case)<sup>6</sup>

**H. Easy:** Must have easy way to keep medications up to date for Wilderness EMTs<sup>7</sup>

## II. Organization

- A. **General:** the kit is divided into several modules. The **Minimum Kit** (and the **Advanced Module** for those with ALS accreditation) is always carried, even if on a rapid response for a rescue, or a small, highly mobile scratch ("hasty") search team. The **Search Module** is carried for most search tasks, especially if the team is fairly large or will be in the field for an extended period. For some searches, both cave and above ground, it may be appropriate to "stage" a Search Module at a central location that will be easily accessible to all search teams, should a team member require its use. For a large team that may split up, several WEMTs may each take a minimum kit with only one WEMT carrying the full search module. The design of several commercial medical kit bags allows a large belt pouch which can Velcro into a larger bag. The belt pouch would be ideal for the minimum kit, and the larger bag for the search kit. (See diagram, last page.)
- B. **Minimum Kit:** every WEMT who has "command" shall carry this kit whenever on a search and rescue operation.
- C. **Advanced Kit:** in addition to the Minimum Kit, every WEMT with advanced training (EMT-Intermediate and above) and WEMSI accreditation to perform advanced skills should carry this additional kit whenever on a search and rescue operation.
- D. **Search Kit** This includes drugs for common or serious problems that might affect a team member if involved in a long search task, but are unlikely to be a significant problem on a short task. This should be carried by WEMTs whenever going on a search, as opposed to rescue, task.

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<sup>5</sup>Will be included in Standing Orders.

<sup>6</sup>Comment> I doubt a small travel lock will be much of a deterrent to anyone who really wants to get into a nylon case.  
Reply> No, it won't, but DEA says you've gotta keep narcotics under lock and key, and there's no point in anything more secure than such a little lock for a medical kit that is in a nylon bag. Even a Pelican case ain't much more secure, and weighs a \_lot\_ more. I favor putting things into a hard case only when really needed.

<sup>7</sup>The prescription form will have a place to note expiration dates.



## Minimum Kit

(Prescription-only items are noted by *Rx*)

### Pain Meds<sup>8</sup>

- #20: ibuprofen 200 mg tablets (e.g., *Advil*®, *Nuprin*®, *Motrin*\*®)<sup>9</sup>
- Rx* #25: acetaminophen with hydrocodone tablets (e.g., *Vicodin*®, *Lortabs*®, *Anexsia*®: 500 mg acetaminophen, 5 mg hydrocodone)<sup>10</sup>

### Allergy

- Rx* #1: injectable epinephrine anaphylaxis kit (*Epi-Pen*®) (may omit if have advanced module with injectable epinephrine)
- Rx* #1: albuterol Rotocap® inhaler<sup>11</sup>
- Rx* #4: Rotocap® albuterol capsules for above
- #6: diphenhydramine 25 mg tablets (e.g., *Benadryl*®)<sup>12</sup>
- Rx* #20: prednisone 10 mg tablets<sup>13,14</sup>

### GI<sup>15</sup>

- #12: 2 mg. loperamide tablets (e.g., *Imodium*®)

<sup>8</sup>In Minimum Kit because: WEMT-Basics may need to give pain medications to the injured to assist self-rescue.

<sup>9</sup>Oral pain medications may allow a patient to self rescue and thus are part of the Minimum Kit. The Advanced Kit contains injectable narcotics but a basic provider might have to use the kit and thus should have access to oral medications.

<sup>10</sup>Some suggested sublingual morphine as a noninjectable stronger narcotic; I've not been able to find any morphine products marketed for this use, nor any good information on any pill formulations that could be used this way. Also suggested was Duragesic) slow-release fentanyl patches; however, they take a long time to build up, and thus are not very appropriate for immediate acute pain. They might be acceptable for long-term pain relief during an evacuation, but that's not the purpose of this personal wilderness medical kit. They might make a good addition to a team kit.

<sup>11</sup>Comment> I would recommend using a metered dose inhaler rather than RotoCaps in a wilderness environment. Though it is controversial, many of my pulmonary colleagues think there are potential problems using RotoCaps in humid (i.e., coastal, rainy, the South in the summer) environments. When humid, the particles may aggregate and not be deposited effectively in the distal airways.

Reply> Interesting. I hadn't heard about this. A dispenser and the four rotocaps that fit inside (with a little trimming of the blister packages) is less than half the size of a metered-dose inhaler, and about a fourth the weight. And remember, we're asking people to carry this stuff with them \_all\_ the time. Is the extra weight worth it? Ask your pulmonary friends, add in your own memories of carrying a pack during a long search, and please get back to me with your thoughts.

Another commentor also queried whether there would be problems with the Rotohaler working well in the field.

Re-Reply> When I queried the attendings I have heard express skepticism over the use of powder inhalers in the past, none of them could provide a reference to support their claims. On searching the literature, I could find little objective data to substantiate this as a big problem. In fact, the best article (Hiller et al, J. Pharmaceutical Sci 1980; 69(3):334-7.) indicated that ALL aerosols tested had increases in particle size at high humidity and that MDI's [Metered Dose Inhalers] tended to be MORE unstable than powder-generated aerosols! Given these facts, I retract my concerns about use of powder inhalers and vow to distrust all of my attendings for at least 6 mos.

I still think MDI's might offer some advantages in terms of # of doses per oz. and more universal knowledge of technique, but I don't feel strongly enough to recommend one system over the other. The point may become moot over the next few years as CFC's are banned in other products and the price of MDI's goes up (maybe a lot) since the propellant will be less widely available.

<sup>12</sup>Comment> Does one need two sedating antihistamines (benadryl and chlortrimeton)? Perhaps Seldane) would be preferable to the latter.

Reply> 1. Don't like the Seldane/erythro interaction.

Reply> 2. Seldane is a poor antihistamine for acute (as opposed to chronic) use.

Reply> 3. We wanted both a short, strong-acting antihistamine (diphenhydramine=Benadryl) for acute short reactions (beestings, dystonic reactions, etc.), and something longer-acting for more long-lived problems (rhinitis, poison ivy, etc.) and Chlor-Trimeton 12 mg extended pills are the least sedating good Q12H antihistamine we could find.

<sup>13</sup>In Minimum Kit because: may be needed to treat bronchospasm or allergy, and the epi and albuterol will wear off in relatively short order (hours).

<sup>14</sup>Comment> I would recommend more prednisone tablets. 60 mg is one dose for an asthma exacerbation.

Reply> Agree. Increased from 6 to 20 to allow multiple large doses for problems such as high altitude cerebral edema, severe allergy, or severe asthma.

<sup>15</sup>In Minimum Kit because: motion sickness, vomiting and diarrhea may all immobilize a rescuer.



- Rx #10: prochlorperazine tablets 10 mg. (e.g., *Compazine*)<sup>16</sup>
- #4: 25 mg. chewable meclizine tablets (e.g., *Bonine*)<sup>17</sup>
- Rx #4: *Trans-Derm/Scop*<sup>®</sup> transdermal scopolamine patches

#### Stings and Bites<sup>18</sup>

- 1: Sawyer Extractor<sup>™</sup> Kit
- #1: 15 cc bottle *Sting-Eeze*<sup>®</sup> solution<sup>19</sup>

#### Cardiac

- #30: aspirin tablets, 325 mg (5 gr.)<sup>20,21</sup>
- Rx #6: nifedipine 10 mg capsules (e.g., *Procardia*<sup>®</sup>, *Adalat*<sup>®</sup>)<sup>22</sup>

#### Antibiotics Etc.<sup>23</sup>

- Rx #24: erythromycin tablets 250 mg.<sup>24</sup>
- Rx #12: ciprofloxacin (e.g., *Cipro*<sup>®</sup>) 250 mg. tablets<sup>25</sup>
- #3: 1 g foil packets bacitracin or povadone-iodine ointment<sup>26</sup>
- #1: 30 cc bottle mild liquid soap, e.g., *Hibiclens*<sup>®</sup>; or, a small piece of solid soap (to save weight)<sup>27</sup>
- 1: 15 cc bottle povadone-iodine solution (e.g., *Betadine*<sup>®</sup>)<sup>28</sup>

<sup>16</sup>Comment> I think compazine suppositories might be preferable to pills, but I recognize the storage problems etc.

Reply> People can grind up a pill, mix it with an M&M from their gorp, or some antibiotic ointment, and make their own suppository.

<sup>17</sup>Comment> GI: Isn't meclizine an Rx in the U.S.?

Reply> If bought as Antivert), yes; if bought as Bonine), no.

<sup>18</sup>In Minimum Kit because: bites and stings occur unpredictably and these treatments must be applied immediately to be of any use. Local sting treatment is included because the pain from multiple stings may be disabling to a rescuer.

<sup>19</sup>Comment> Is Sting-Eeze of proven efficacy?

Reply (KC)> No good scientific evidence I'm aware of, but anecdotally it works like a charm. It's a witches' brew of all available OTC anesthetics and sting relievers. I've used it with good success myself; it really helps.

<sup>20</sup>In Minimum Kit because: aspirin so important in the early treatment of unstable angina or MI, which is becoming more common in the wilderness.

<sup>21</sup>Some have suggested to move 2/3 of each of the analgesics, etc. into the search kit, but this makes the kit as a whole more cumbersome; also, it makes it more likely that the minimum kit will be out of a medicine when needed.

<sup>22</sup>Comment> Advanced stuff: I would add sublingual nitroglycerin and/or paste to the list.

Reply> They don't last long in a pack, especially in the summer and if being kept in a car trunk; keeping things updated in a SAR pack is a big problem, too. We decided to simply rely on nifedipine for vasodilation, coronary disease, etc.

<sup>23</sup>Both erythromycin and ciprofloxacin in Minimum Kit because: might have patient with open fracture and wish to administer oral antibiotic immediately; might have team member with severe diarrhea who needs ciprofloxacin immediately; antibiotics may be lifesaving if the patient is ill with a serious infection rather than injured.

<sup>24</sup>Comment> Rather than erythro, you might consider one of the newer macrolides. Azithromycin, though costly, offers the advantages of good GI tolerance (and we're in the woods after all) and the ability to carry a 2 week course in 6 pills.

Reply> Yes, but Zithromax [azithromycin] is \_very\_ expensive, and these people need to buy their own drugs. If it were the same cost as erythro, would agree. It's also pregnancy category B, unlike Biaxin [clarithromycin], so azithromycin is a better choice for that reason. However, unlike erythro, azithro is not a pediatric medication.

Many others suggested azithromycin as an alternative, and that samples are available; but doubt we can get enough samples for all who will need it.

Decreased from 40 to 24; this will provide 6 days of 250 QID, or 3 days of 500 QID. Resisted the temptation to go with just 500 mg tablets; 250 mg tablets allow spacing doses better for those with GI intolerance.

<sup>25</sup>Some have argued for the addition of various favorite antibiotics: cephalixin, among others. We have resisted the temptation to provide an antibiotic for every conceivable condition, instead trying for one with good gram positive coverage that can be given to just about anyone (erythromycin), and one with excellent gram negative coverage, including all common causes of infectious diarrhea and UTIs.

Changed from 20 to 12. This should provide 6 days of 250 BID, or 3 days of 500 BID.

<sup>26</sup>Can also be used as lubricant if needed.

<sup>27</sup>Solid soap is not ideal, but is much lighter, and can be combined with some povadone-iodine solution for antibacterial effect.

<sup>28</sup>Comment> Do we need Hibiclens)?

Reply> Dunno about Hibiclens; might be nice, but again it's heavy. Plain soap (Dr. Bronner's, or whatever one's carrying) is probably OK.

Some suggested using foil packets of povadone-iodine solution; however, we've talked with enough people who've had them



### Thermometer

- 1: Becton-Dickinson digital thermometer (may substitute Radio Shack™ or similar continuous-reading digital thermometer)
- 1: spare battery for above
- 10: thermometer covers for above<sup>29</sup>

### Misc.

- #4: thiamine (vitamin B-1) 300 mg. tablets<sup>30</sup>
- Rx #4: haloperidol 5 mg. tablets (e.g., *Haldol*®)<sup>31</sup>
- #2: packets *Gatorade*® or *ERG*) powder, each to make 1/2 liter
- 2 pr: exam gloves<sup>32</sup>
- 1: CPR shield
- 1: 1" (by at least 10 yards) waterproof adhesive tape<sup>33</sup>
- 3: small prepackaged units of tincture of benzoin<sup>34</sup>
- 1: 3" by 5 yards (stretched) elastic bandage (e.g., *Ace*®, *Coban*®, *Vet-Wrap*®)
- 1: 3" by 5 yards (stretched) conforming roller gauze (e.g., *Kling*®)
- 8: medium-size (e.g., 3" x 3") gauze pads<sup>35</sup>
- 1: OB-type compressed vaginal tampon<sup>36</sup>
- 3: #11 scalpel blades, sterile
- 1: string for ring removal
- 1: paper clip, medium size<sup>37</sup>
- 1: nylon zipper bag or equivalent for Medkit
- 1: waterproof contents/protocols/standing orders<sup>38</sup>
- 5: one-pint freezer-style zip lock plastic bags (if not available elsewhere in SAR pack)

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explode in their medical kits to stick with the more-rugged 15cc bottles.

<sup>29</sup>Can use antibiotic ointment as lubricant.

<sup>30</sup>Comment> Why do we need thiamine?

Reply> To give to people who have been starving for a long time (i.e., weeks) when first feeding them, to prevent cardiovascular collapse (get a copy of the current Section 4 of WEMT Curriculum from the Center for Emergency Medicine, 412-578-3200, if you want the details).

<sup>31</sup>Comment> I'm not sure I see the need for PO Haldol).

Reply> EMT-Basics need to sedate patients, too.

<sup>32</sup>No stethoscope is included, as can simply place ear against the chest or abdomen for lung or heart or bowel sounds; and, BP cuff and stethoscope too heavy and of only minor utility compared to the weight.

<sup>33</sup>Increased from 3 to 10 yards, and added the word "cloth," to allow for taping an ankle securely with the contents of just one personal medical kit.

<sup>34</sup>This was added due to the great difficulty of getting tape or even Bandaidsi to stick in wet weather.

<sup>35</sup>Some have suggested the addition of a triangular bandage; however, this can usually be improvised from something such as the tail of someone's shirt; or, duct tape can be used instead.

<sup>36</sup>This makes a compact but very absorbent dressing; some suggested adding various types of trauma dressing, but we opted to pick something that was very small, not wanting to increase the size of the kit. Of course, it can also be used as a tampon for a female patient with menstrual flow.

<sup>37</sup>For trephining subungual hematomas.

<sup>38</sup>Will be provided by WEMSI.



### Advanced Kit<sup>39</sup>

- Rx 2: ketorolac tromethamine 60 mg. injection (e.g., *Toradol*®)
- Rx 2: morphine sulfate 10 mg. injection
- Rx 2: naloxone 2 mg. injection (e.g., *Narcan*®)
- Rx 1: ceftriaxone 2 g injection and sterile water for reconstitution (e.g., *Rocephin*®)<sup>40</sup>
- Rx 2: epinephrine 1 cc 1:1000 injection: substitutes for Epi-Pen in basic kit
- Rx 2: diphenhydramine 50 mg/1cc injection (e.g. *Benadryl*®)
- Rx 2: prochlorperazine injection 10 mg/2cc (e.g., *Compazine*®)
- Rx 2: haloperidol 5mg/1cc injection (e.g., *Haldol*®)
- Rx 2: dexamethasone 100mg/10cc injection (e.g., *Decadron*®)<sup>41</sup>
- 6: alcohol prep pads, in foil
- 1: Tubexi injector
- Rx 2: 1 cc syringes
- Rx 2: 3 cc syringes
- Rx 2: IM needles
- Rx 2: SQ needles
- Rx 2: 18 ga over-the-needle IV catheters<sup>42</sup>
- Rx 1: 6.5 mm endotracheal tube<sup>43</sup>

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<sup>39</sup>Physicians may want to add: penicillin, caffeine pills for caffeine withdrawal headaches, trimethoprim/sulfamethoxazole, Pyridium), Duragesic) patches, IV midazolam, IV ketamine, IV thrombolytic (Eminase) is at present the best choice, as can be used in a single dose), a cobalt blue penlight, a pocket otoscope and ophthalmoscope, a prescription pad, Merocel) epistaxis tampons, a Foley catheter, a small skin stapler, some local anaesthetic, wire saw for amputations, and a Kelly clamp, needle holder, and suture material, at least for tying off bleeders.

<sup>40</sup>Comment> I would consider increasing ceftriaxone to 2 g for a full 24 hrs supply.

Reply> Agree.

<sup>41</sup>For treating high altitude cerebral edema, asthma or other bronchospastic problems, or severe allergy.

<sup>42</sup>For relieving tension pneumothorax.

<sup>43</sup>Can be placed by digital technique even without a laryngoscope.



## Search Kit

### Pain Meds Etc.

- #30: acetaminophen tablets, 325 mg (e.g., *Tylenol*)<sup>44</sup>
- Rx #4: cyclobenziprine 10 mg. tablets (e.g., *Flexeril*)<sup>45</sup>
- Rx #4: phenazopyridine hydrochloride 200 mg. tablets (e.g., *Pyridium*)<sup>46</sup>

### Cough, Cold, Allergy Etc.

- #1: 3 cc squeeze bottle oxymetazoline nasal spray (e.g., *Afrin*)
- #8: 12-hour sustained-release pseudoephedrine tablets 120 mg. (e.g., *Sudafed*)
- #8: 12-hour sustained-release chlorpheniramine tablets 8 mg. (e.g., *Chlor-Trimeton*)<sup>47</sup>
- #8: dextromethorphan-containing cough drops (e.g., *Hold*)

### Eye

- Rx #1: 1 cc dropper tube tetracaine ophthalmic solution
- #3: fluorescein strips<sup>48</sup>
- Rx #1: 3.5 g tube polymyxin/bacitracin (e.g., *Polysporin*) or bacitracin ophthalmic ointment
- Rx 1: 2 cc dropper bottle cyclopentolate ophthalmic solution 0.5% or 1% (e.g., *Cyclogyl*)

### GI

- #12: antacid tablets
- #4: bisacodyl tablets 5 mg. (e.g., *Dulcolax*)<sup>49</sup>
- #12: bismuth subsalicylate tablets (e.g., *Pepto-Bismol*)

### Allergy

- Rx #1: 15 g tube fluocinolone acetonide cream 0.2% or similar high-strength steroid cream or lotion (e.g., *Valisone*, *Benisone*, *Lidex*, *Kenalog*, *Aristocort*, *Uticort*, *Synalar*)
- Rx 1: 1 oz. tube *Pramosone* 1% Cream

### Altitude Etc.<sup>50</sup>

- Rx #6: acetazolamide 250 mg tablets (e.g., *Diamox*)

<sup>44</sup>Comment> Does one really need aspirin and ibuprofen? Both decent analgesics and NSAIDs.

Reply> Yes, but aspirin can be used by itself for the anti-platelet effect, for example for a student at our last WEMT class; he had coronary-ish chest pain first relieved by SL NTG but later returned and it was unrelieved by NTG. Aspirin is important for this. And, some people really do better with aspirin than acetaminophen or ibuprofen for minor aches, or at least think they do.

<sup>45</sup>Comment> Rather than cyclobenziprine, valium (though more of a hassle to get and keep secure) would be more versatile and is an effective muscle relaxant.

Reply> Recent research show that benzodiazepines don't really do much to relax muscles, and that Robaxin and Flexeril (cyclobenziprine) are more effective.

Comment> I would also favor the addition of an injectable benzodiazepine.

Reply> For sedation? Can use haloperidol for this. For muscle relaxation? See comments on Flexeril, above.

<sup>46</sup>UTIs are more common among women than men. Men: if you'd like to leave this out, please see the comments under antifungal cream.

<sup>47</sup>We chose both long-acting and short-acting antihistamines because they have different uses. For example, stings or other acute allergic reactions usually need only short term treatment, and diphenhydramine can also be used as a short-acting sedative. whereas the sustained drying effect of sustained-release chlorpheniramine is ideal for viral URIs.

<sup>48</sup>Comment> Eye: Fluorescein strips. Should a blue light be on the list?

Reply> Nice, but the fluorescein even works pretty well by daylight or mini-MagLite, and a blue penlight adds a lot of weight for only a little benefit, compared to the fluorescein strips, which weigh basically nothing.

<sup>49</sup>It was suggested that we cut down on the number of these tablets; though constipation can be disabling, it's not usually as disabling as diarrhea. Changed from 6 to 4.

<sup>50</sup>Oral dexamethasone [e.g., *Decadron*] not carried for high altitude cerebral edema, as 30 mg of prednisone is equivalent to the 4 mg dexamethasone dose usually used for HACE.



Misc.

- #1: 15 g tube miconazole nitrate cream 2% (e.g., *Micatin*®, *Monistat*®)<sup>51</sup>
- 1: pr. small sharp scissors (not necessary if available on WEMT's pocket knife)
- 1: pr. fine-point splinter forceps (not necessary if available on WEMT's pocket knife)
- 1: SamSplinti or equivalent flexible splint<sup>52</sup>
- 4: 3" x 4" pieces of moleskin
- 10: small adhesive bandages (e.g., 1" x 3" *Band-aids*™, *Coverlet*™)
- 3: small pieces of clear adherent dressing (e.g., *Tegaderm*™, *OpSite*™)<sup>53</sup>
- 5: medium-size "suture strips"<sup>54</sup>
- 6: sterile cotton applicators ("*Q-tips*®")

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<sup>51</sup>Lotrisone) was suggested as an alternative for "shotgun" therapy of itchy rashes or vaginitis. At present, we are still staying with separate antifungal and steroid creams, as more effective and more flexible.

One suggestion was to use the new, highly effective antifungal terbinafine (*Lamasil*) instead of miconazole. However, it is prescription-only, costs 2 to 10 times as much as miconazole, and there is no information on whether or not it can be used to treat yeast vaginitis.

Women reviewing this medical kit have almost universally demanded something for yeast vaginitis. Therefore, we discount suggestions that we drop this medication if the suggestion comes from a man.

<sup>52</sup>Some suggested the addition of a traction device; however, a traction device can usually (though not always) be improvised with materials at hand.

<sup>53</sup>Several people suggested adding these, as they are ideal field dressings: waterproof but vapor-permeable.

<sup>54</sup>Removed butterfly strips as suture strips much superior.