What’s in Your Backpack?  
Wilderness Medications

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Goals and objectives

• Prepare for these conditions in your first aid kit
  – Dermatitis
  – Insect Bites
  – Anaphylaxis
  – Allergy
  – Sun protection
  – Infections
  – Trauma
Plant dermatitis

- Anacardiaceae and related families: Poison Oak, Sumac, Ivy
- Plant Toxin: Urushiol in sap/oil (both irritant and allergen)
- **Black spot test:** crush plant contents thoroughly, especially leaf stalks btw the folds of white paper. Urushiol will turn dark brown in 10 minutes and black in 24 hours
- Will be able to see oily black spots on the leaves of the plant
- If burn poison Ivy, the smoke is a potent irritant
- Blister fluid does not spread disease
- **Steroids, Diphenhydramine** (Benadryl®), **Aloe, Honey**
Who should you be more afraid of?
Bites: Insect repellants

- Keep covered with clothing
- All you need is 30% Deet or 20% Picaridin
- Picaridin is as effective as Deet and safe on plastic
- Permethrin- water insoluble- can treat clothes up to 50 washes depending on strength
- Sulfur- “Chigger Away”- only works on chiggers
- Citronella- have to apply 3 x per hour
  - Not as effective: Kansas BBQ vs African safari
- Deet + Permethrin = best combination

Who is the most Deadly?
Anaphylaxis

- **Epinephrine**
  - IM 1:1000
  - Multiple doses without extra work

- **Epinephrine** (EpiPen®)
  - 0.3 mg per dose (0.3 ml of 1:1000)
  - Will get 4-5 more treatments per EpiPen®

Allergy

- **Diphenhydramine** (Benadryl®)
  - Local anesthetic
  - Sleep aid/sedation
  - Anti-histaminic with allergic reaction
  - Nausea and Vomiting
  - Pain/Analgesia
  - Anti-itch

- **Honey**
  - Oral
    - Decrease sensitivity to local allergens by consuming local honey
  - Topical
    - Not recommended if bears are around or you are having difficulty with bugs 😊
    - Anti-bacterial and anti-inflammatory properties
    - Darker the honey the stronger the effect
Sun Protection

- **UVA Blockers**
  - * Benzophenones (oxybenzone and dioxybenzone)
- **UVB Blockers**
  - PABA/PABA Esters
  - Cinnamates
  - Salicylates
  - Ensulizole
- **Particulate Blockers (inorganics)**
  - Titanium Dioxide (UVB)
  - Zinc Oxide (UVA + UVB)
- **Octocrylene**
  - Stabalizes avobenzone
  - Non comedogenic $$$$$
Infection

• Don’t Delay Antibiotics: Injury and Diarrhea
  – Common things are common
  – Longer incubation time: lyme, histoplasmosis, etc

• Much worse bacterial infections are present in the hospital → Less likely to find MRSA in the woods, except colonized on you

• Bring Probiotics!
  – So much good for GI and GU tract
  – Lactobacillus

Camping in upstate New York
Traditional Mayan Cuisine

Infection

- **Amoxicillin/clavulanic acid** (Augmentin®)
  - Otitis Media
  - Abdominal Infections
  - Cellulitis
  - Sinusitis
  - Pneumonia
  [can substitute Cefuroxime (Ceftin®) - may need additional anaerobe]
- **Ciprofloxacin**
  - Traveler’s diarrhea
  - UTI
  - Salmonella
- **Metronidazole** (Flagyl®)
  - Giardia
  - Abdominal infections
  - Amebiasis
  - STDs
- **Doxycycline**
  - Increased sun sensitivity
  - Give doxycycline hyclate to decrease GI side effects
  - Tick Born illnesses: i.e. Lyme disease
  - MRSA
Infection

• Irrigation/cleanse
  – Alcohol (over 80 proof) and Iodine will kill all cells including WBC
  – Chlorhexidine (Hibiclens®): won’t destroy WBC’s in the wound

• Topical Creams
  – polymyxin, bacitracin, neomycin
  – Honey (both anti-bacterial and anti-inflammatory properties)
Wound Care

• **Chitosan** (Celox®)
  – Made from Crustacean Shells
  – Granules sprinkled over active bleeding

• **Burns**
  – Aloe
  – Honey
  – Topical Antibiotic
  – NSAIDs/Acetaminophen (Tylenol®)
  – Appropriate Dressing

Oral Medications

– **Pain**
  • ASA 325 mg
  • Acetaminophen (Tylenol®) 500 mg
  • Ibuprofen 400 mg

– **Diarrhea**
  • Loperamide 2 mg

– **Altitude illness**
  • Acetazolamide (Diamox®) 125 mg
  • Dexamethasone 4 mg
  • Nifedipine 10 mg

– **Motion sickness**
  • Meclizine 25 mg

– **Malaria**
  • Mefloquine 250 mg

– **Antibiotics/Antifungal**
  • Ciprofloxacin (Cipro®) 500 mg
  • Amoxicillin/clavulanic acid (Augmentin®) 875/125 mg
  • Doxycycline 100 mg
  • Fluconazole 150 mg
  • Metronidazole (Flagyl®) 500 mg

– **Antihistamine**
  • Diphenhydramine (Benadryl®) 25 mg
  • Ranitidine 150 mg

– **Miscellaneous**
  • Probiotic
  • Honey
  • Phenazopyridine 100 mg
Topical Medications

- Antibiotic Ointment: polymyxin, bacitracin, neomycin
- Medium potency steroid: Fluocinolone cream 0.025%
- Gentamicin sulfate (Gentamicin opthalmic ointment®)
- Miconazole cream 2%
- Oxymetazoline nasal spray (Afrin®)
- Aloe Vera gel
- Sunscreen 15-30 SPF
- DEET/Permethrin
- Zinc oxide cement (Cavit Dental®)/Eugenol/Floride topical (Biotene®)
- 2-octyl cyanoacrylate (Dermabond®)
- Povidone-Iodine
- Acetic acid/Vinegar
- Honey

Questions?
Thank you!

References

1. Auerbach, P. Wilderness Medicine, 6th ed. 2012
2. UptoDate
3. WMS student elective and conferences 2013-2015
6. www.mynatureplace.org
7. www.coolasuncare.com

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Slides for Additional Reference

- Water Purification
- Dehydration
- Altitude Environmental Concerns
- Chronic medical conditions
- Tools and Medical Bag
- Snake Bites
- Nematocyst Stings
Muddy Water

- Clarification
  - Alum 1/8-1/4 tsp/gallon
    - Binds to sediments and sinks to the bottom
    - Allow 30-60 minutes to settle, then use coffee filter

- Running through cotton shirt

Water Purification

- Clear water
- Disinfectants: Halogens
  - Iodine tablets
    - 2% Iodine (Betadine = 10% organic iodine complex)
    - To remove iodine taste: ascorbic acid (powder electrolyte solution), sodium thiosulfate
  - Chlorine dioxide
    - Increased coverage against crypto/protazoa
    - Sensitive to sunlight
    - 4 hours to work, limited activity
#1 Problem = Dehydration

- WHO rehydration packets (need at least salt and sugar)
- Homemade ORS: 1L H2O, ½ teaspoon salt, 6 teaspoons sugar
  - i.e. Gatorade powder
  - Acute traveler’s diarrhea can lose up to 6L/hour of water in the stool.
- Coconut Water for oral or IVF as it is Isotonic
  - used in the Pacific front during WWII

Epinephrine retrieval video

- [https://www.youtube.com/watch?v=sbpmYuixMAg](https://www.youtube.com/watch?v=sbpmYuixMAg)
Environmental Considerations

- Altitude
  - Treatment for AMS, HACE and HAPE
    - Diamox 125 mg
    - Dexamethasone 4 mg
    - Nifedipine 10 mg

Altitude illness

- Acute Mountain Sickness (AMS)
  - Headache + 1 of the following
    - GI upset
    - Fatigue/weakness
    - Dizziness/lightheadedness
    - Difficulty sleeping
- High Altitude pulmonary edema
- High Altitude Cerebral Edema
  - Ataxia or Loss of Consciousness in patient with pre-existing AMS or HAPE
- Gold Standard: “I feel sick” = reduce activity
- Altitude: 9000 ft
AMS

- Tylenol/Ibuprofen
- Rest
- Rehydrate
- Zofran
- Acetazolamide 5 mg /kg/day
- Descend if no improvement
- Ascend when symptoms resolve

HACE Treatment

- AMS +
- Oxygen
- Organized descent
- Dexamethasone 8 mg IV then 4 mg q 6 hours
- Hyperbaric chamber- (Gamow bag) until descent possible
- IV rewarming, rehydration and anti-emetics
HAPE

- MCC of death from High altitude illness
- No warning signs, can be very abrupt
- Often occurs the second night
- May occur in the absence of AMS
- CXR looks like non-cardiogenic pulm edema
- Not ARDS
- Vasogenic pulm edema
- Vasoconstriction + intense hypoxia going on all day
- PA pressures high
- No dyspnea until leak begins
- Frothing at the mouth—will sound like drowning
- Noninflammatory, high permeability leak

HAPE treatment

- Oxygen
- Nifedipine or PDE-5 Inhibitor
- CPAP
- Gamow bag/hyperbaric chamber
- CPAP will use up O2 tank in 10 minutes
- Gamow bag
  - Can only stand to be in for 45 minutes
  - Condensation from breathing, have to pee
  - Have to pump every 5 seconds to get rid of CO2 and keep pressure in bag
Chronic Conditions

- Written medical history of each member
  - COPD/Asthma
  - Diabetes
    - No metformin if in altitude/hypoxia (over 9,000ft)

- Stress testing- pre-op clearance if indicated

- Bring EKG for all cardiac patients (and ASA and Nitrates)

- Anemia: for every 1% fall in Hct, max O2 consumption decreases by 1% and endurance decreases by 2%.

Tools

- Duck Tape
  - Butterfly bandages
  - Blister care
  - Remove spines of bugs/cactus
  - Snow Glasses- cut slits to see through

- Tweezers/Misquito forceps

- Gloves
  - Irrigation: fill glove with water and poke a pinhole in finger
  - Can use palm of glove as dressing with burns-sterile

- Swiss army knife
- Knife Blades: #10 and #11
- Adhesive tape 2”
- Needles: 25G, 18G, 12G
- 10cc Syringe
- Foley catheter
  - Chest tube
  - Nose bleeds
  - Urinary catheter
  - Airway
  - Venous tourniquette

- 550 paracord
Tools

- Safety Pins
- Mole Skin
- Steri Strips
- Thermometer
  - Low reading for hypothermia
- SAM splint
  - Use to protect IV Medications
- Needle driver
  - Remove foreign bodies

- Superglue
  - Skin lesion repair
  - Hold down steri strips
- Dental Floss
  - Thread for clothing/equipment repair
  - Suture substitute
- Small plastic bags
  - Cover wounds
  - Cover sucking chest wounds (leave one side open)
  - Irrigation by making small hole
- Large Plastic Bags
  - Hypothermia wrap
  - Rain poncho

Tools

- Suture: 5.0 nylon and 5.0 dexon (to tie off a bleeder)
  - Can use the patient’s hair if scalp lac and long enough

- Vaseline gauze
  - Burn dressing
  - Toenail off with open nail bed
  - Sucking chest wound
  - Fire-starter
Safety Pins

1. Replacing the lost screws in your glasses
2. Improvised glasses – Draw 2 circles in a piece of duct tape where your eyes would fit. Use the pin to make holes in the circles and then tape this to your face. Will partially correct nearsightedness
3. Skin testing for sensation
4. Irrigation of wounds with a safety pin punctured baggie
5. Removing imbedded foreign bodies from skin
6. Draining an abscess or blister
7. Draining a hematoma under a fingernail
8. Fish hook
9. Hold gaping wounds together
10. Replacing a broken zipper
11. Holding gloves or mittens on your clothing
12. Unclogging jets on camp stoves
13. Pin triage note to victims
14. Sling and swath for arm and shoulder injuries

Medical Bag

• Compartmentalize: Brightly colored
• Keep Contents list at the top
• Don’t mix pills in bottles.
• No acronyms
• Store Medications in a Pelican box
  – Has Seal on it and waterproof down to 60 feet
Bites: Snake

- Keep bitten area dependent- do not elevate
- No tourniquet
- Place in splint/Ace wrap (stops movement)
- Mark area of edema
- Remove jewelry and tight clothing
- Get to nearest facility for antivenom- can take up to 10 vials for response

Bites: Jellyfish/Nematocyst

- Vinegar/Acetic Acid for jellyfish/nematocyst stings
  - Venom is heat labile- soak in hot water solution: 105°F
    - Ideally pour vinegar for 30 seconds and then soak for 30 minutes
  - Do not use fresh water- has to be salt water (with baking soda works best)
  - Do not pee on the sting- pH has to be 5
  - Remove stinger by scraping with flat object
  - Reapply Vinegar, baking soda/salt water solution after stinger removed.
- Above rules for jellyfish stings do not apply to the Man o’ War