WINTER 2012

WILDERNESS MEDICINE

COMBINING YOUR PROFESSION WITH YOUR PASSION™

Volume 29, Number 1

Flying Doctors of Africa

Q&A with Dr. John Walden

Dispatches from the Field

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WHAT'S INSIDE

The goals of *Wilderness Medicine* magazine are to:

1. Provide timely information regarding Wilderness Medical Society news and activities.
2. Provide a forum for exchange of ideas and knowledge regarding wilderness, environmental, and travel medicine.
3. Disseminate wilderness medicine information to the wilderness, outdoor, and travel community.

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WILDERNESS MATTERS Arthur A. (Tony) Islas MD, MPH, CAQ – Sports Medicine, FAWM, President WMS

It's now the heart of winter and I hope that you have had a few moments to explore and enjoy the wilderness under the great white silence. Those moments seems to get harder and harder to capture with a busy schedule.

I recently took my teenage niece for a hike during the holidays. As we neared the end of our trail, I asked her if any of her friends went hiking with her. "Most of my friends don't really like hiking. They don't really like the outdoors….kind of don't want to get the 'nature' on them," she replied. Reminiscent of Richard Louv's *Last Child in the Woods*, I began thinking about my niece and her friends, particularly the symmetry between them and me, my colleagues in El Paso and the WMS. We at the WMS spend a great deal of energy creating amazing learning opportunities for like-minded individuals, adding to the literature and expanding our understanding of medical care in austere environments. However, I am constantly reminded that we serve a dual purpose. In addition to "expanding the evidence-based practice" of wilderness medicine, I find that most members also serve to our friends, colleagues and family as guides, avenues or shepherds back to the natural world. Through this, the WMS can affect and encourage the hearts and minds of a great many to protect and study our wild places. In this age of hi-tech everything, this is no trivial matter and we do make a difference. This being said, the more WMS members, the greater the impact we can create on the world.

I have a goal to achieve 3000 WMS members by the Whistler Conference this summer. I challenge everyone reading this article to bring in one new person between now and the Whistler conference. As we reach this milestone, we not only help create a stronger society but, help to create a stronger wilderness for us all.

In Peace
Tony

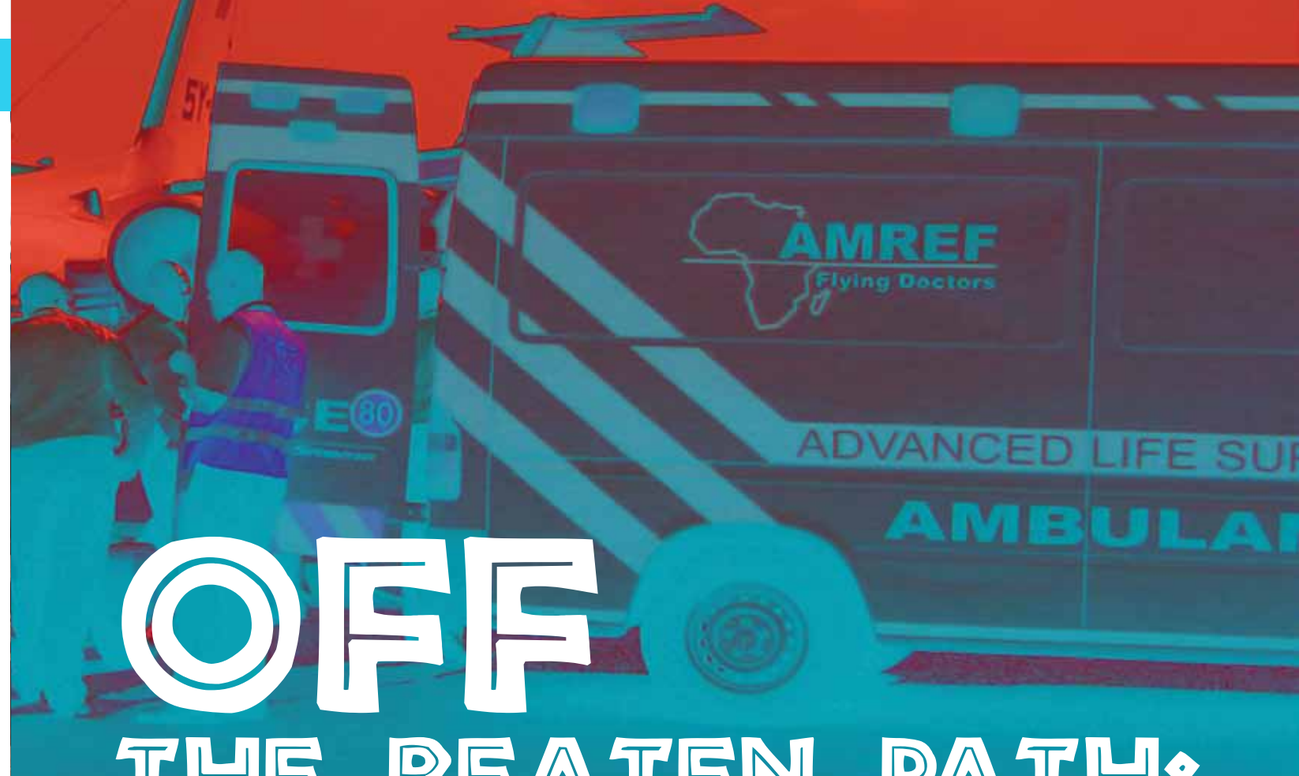
P.S. Our Desert Meeting in Tucson this past fall was not only a great success, but it was a really fun time. It had been a dream of mine and many other desert rats in the WMS to bring back the meeting, and I'm grateful to my co-conference coordinator Brad Bennett and the WMS staff for helping make it a reality. I'm looking forward to the Park City in February and saying hello to everyone and touching base with those who are on the same WMS Everest trip that that I will be going on in the spring. If not Park City, I hope to see you all in Whistler in July for the 6th World Congress on Wilderness Medicine!

February 4-8, 2012
Wilderness and Mountain Medicine, Park City, Utah

April-May 2012
WMS Everest CME Experience-South Side

July 13-17, 2012
World Congress of Wilderness Medicine, Whistler, BC, Canada

wms.org/conferences/default.asp



OFF THE BEATEN PATH:

Challenges in African Retrieval Medicine

James Raitt, MD Photos courtesy of James Raitt

African Medical and Research Foundation (AMREF) Flying Doctors (AFD), based at Wilson Airport in Nairobi, provides daily air evacuations throughout East Africa, serving insurance companies and the public at large, including offering evacuations on a charity basis. The following cases show some of the challenges that are encountered during retrieval work in East Africa.

"One of the features of working with AFD is that you never know what you are going to find when you arrive to meet a patient."

These are common themes in trauma care in East Africa, with no disparagement to the work they do in under-resourced rural hospitals:

- Lack of cervical spine immobilization, or consideration of the possibility of cervical spine injury
- Inadequate immobilization of fractures
- The routine administration of steroids to trauma patients
- Failure to respond to deteriorating vital signs
- Poor quality of x-rays

TRAUMA CARE

We flew to a small airstrip in the middle of tea plantations. A 71-year-old man had been injured in a road traffic accident the day before and cared for at the local clinic. The clinic's staff brought him in their ambulance to meet us at the airstrip. The patient had sustained a head injury, with possible loss of consciousness, a closed fracture of the distal radius and an open fracture of the distal femur. At admission he had received two liters of fluid (a mixture of crystalloid and colloid), steroids (commonly given to trauma patients in East Africa) and a cephalosporin. His vital signs and sensorium had been meticulously charted throughout the night: his blood pressure dropping to 90/50 and his oxygen saturations dropping to 85% on air, but no interventions had begun. He had had a washout of the open femoral fracture and the wound had been closed with sutures. The upper and lower limb fractures had been put in plaster of Paris backslabs, but these had not set correctly and were floppy. The distal radius fracture had not been reduced before being splinted with plaster.

When he arrived at the airstrip, we immobilized his cervical spine, transferred him to a vacuum mattress, applied a traction splint to the femoral fracture, and administered fluids and analgesia. On examination he was found to have reduced air entry on the right side of the chest. A chest x-ray had been taken previously but was of such poor quality (rotated, under-penetrated and not showing the whole thorax) that it was not possible to determine the presence or absence of a pneumothorax.

Transfering patient from plane to ambulance.

Once the patient was packaged for transfer and loaded onto the aircraft, departure was delayed as the bishop had arrived to lead us all in prayers for the injured, the medical staff, the pilots and those who maintain the aircraft. After an uneventful transfer, the patient was handed over to the orthopedic team in a Nairobi Hospital and underwent surgery the same day.

I don't have any simple solutions, but the work done by the Primary Trauma Foundation on their Primary Trauma Course covers simple steps that are applicable in resource-poor environments to improve the care of the injured patient. **www.primarytraumacare.org**

Unexpected Medical Conditions

One of the features of working with AFD is that you never know what you are going to find when you arrive to meet a patient. The information received before take-off can be inaccurate or incomplete and, of course, the situation can change while the outgoing flight is in progress. On one occasion we were asked to go to retrieve three "seriously injured patients" after a car crash in Northern Kenya. After we had prepared drugs, fluids and splints during the outgoing flight, all three patients walked from the airport terminal to the aircraft to meet us. On a separate occasion when arriving to retrieve a patient who, we were told, might have symptoms of a gastric ulcer, we found him to have severe pancreatitis that required six weeks in intensive care.

Bureaucratic Delays

The problems we face are not just medical. Dealing with administrative issues such as border controls and hospital fees can be a major impediment to our clinical work. A call came in from a clinic in Uganda that a patient had arrived

"The challenges faced when conducting retrieval medicine in East Africa go beyond issues of clinical medicine."

the day before having suffered a large septal myocardial infarction that had been managed with thrombolysis and anti-platelet therapy. Twelve hours later the patient had developed complete heart block and required treatment that exceeded the capacity of the clinic caring for him. AFD were asked to retrieve him from the clinic and deliver him to a Nairobi Hospital for definitive care. Take-off was delayed as the patient didn't have health insurance and we had to wait for money to be transferred from relatives to cover the cost of the flight. Meanwhile we prepared inotropes and equipment for external pacing.

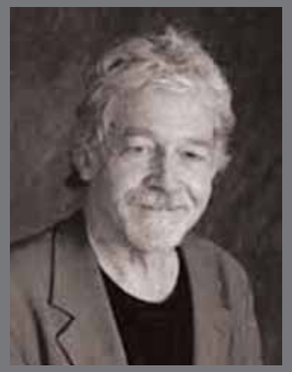
By the time we landed in Uganda it was getting dark. We were to be collected by an ambulance that took the nurse, me and all our equipment to the clinic first, and then returned us and the patient to the airport. There was a delay as the airport security staff was reluctant to allow the ambulance onto the airfield to meet our plane, but eventually we were on our way. When we got to the clinic, the patient was conscious and his heart rate and blood pressure were being maintained on a saline drip, with adrenaline added to it, as they had no syringe pumps and no other inotropes. As we packaged the patient for transfer and moved him to the ambulance, he had a run of ventricular tachycardia that self terminated just as I was about to deliver a shock. After an hour in the ambulance we reached the airport. Despite being critically ill, the patient had to complete emigration procedures and be inspected by a security guard before we were allowed to drive onto the airport tarmac. After an hour's flight and another 20 minutes ambulance journey, we arrived at the hospital to find that, contrary to what we had been told, no arrangements had been made to cover his hospital bills and so there was a further delay of 30 minutes before they accepted the patient. At least while we waited for them to accept him, we were in the Emergency Department.

The challenges faced when conducting retrieval medicine in East Africa go beyond issues of clinical medicine. Patience, flexibility and a sense of humor are key attributes for working in this demanding but highly rewarding field of medicine.

Prior to moving to Kenya Dr. Raitt completed a 2-year program on Emergency Medicine, Anesthetics and Intensive Care. Before studying medicine he served as a Royal Marines Officer for 7 years.

More details about the work of AMREF Flying Doctors can be found at www.flydoc.org

Patient packaged ready for transfer. Note the crowd of onlookers, a common feature of pre-hospital care in Africa.



Q & A WITH DR. JOHN WALDEN

Sam Schimelpfenig, MD

With over 40 years experience living with tribal societies in the Amazon Basin and authorship of both *Jungle Travel & Survival* (Lions Press; 2001) and a chapter of the same name in Auerbach's *Wilderness Medicine* (Elsevier/Mosby; 2012), Dr. John Walden takes time to lend us his expertise in travel medicine. He is a professor in the Department of Family and Community Health at Marshall University Joan C. Edwards School of Medicine, and graduate of the West Virginia University School of Medicine. He pursued studies in clinical tropical medicine at Gorgas US Army Hospital in the Canal Zone, Walter Reed Army Institute of Research, and the Liverpool School of Tropical Medicine and Hygiene in England.

Marshall University's SOM training course for Amerindians physician extenders in Makuma, Ecuador. Dr. Walden standing second from right. Photos courtesy of John Walden.

How does one receive training in tropical medicine?

The American Society of Tropical Medicine and Hygiene has links to fellowships and training programs as well as offering further education on this topic at their yearly meeting. Universities such as West Virginia University and Johns Hopkins also offer courses and seminars. There are several family medicine residency tracks in Global Medicine that can help guide young doctors in this direction. Publications including the textbooks *Wilderness Medicine* and the classic American text on the subject, *Tropical Infectious Diseases* (Guerrant RL, Walker DH, Weller PF, eds. Elsevier Health Sciences; 2011) invaluable resources. Online resources such as Up-To-Date and the Centers for Disease Control are other current sources of good information.

What are some common conditions seen by a tropical medicine specialist?

In addition to diseases that are frequently encountered in a particular locale, one should always bear in mind that tropical diseases are not only seen in the tropics. Many of the diseases that one might usually associate with the tropics are also seen in the United States – especially intestinal infections by protozoa such as Giardia and Cryptosporidium or nematodes such as the Ascaris worm. Topical organisms such as scabies and head lice are also frequently encountered. Traveler's diarrhea (usually caused by the *E. coli*), amebiasis, and malaria are not uncommon in those who have visited or lived in other parts of the world. Other diseases of the tropics, in addition to many other parts of the world, include tuberculosis, hepatitis, typhoid fever and sexually transmitted infections. All of these diseases can be encountered in the United States by returning travelers, refugees, and immigrants.

Dr. Walden (in front) with faculty and students from Marshal University Joan C. Edwards School of Medicine trekking in Ecuador.

Are we seeing these diseases more commonly in non-tropical areas due to increased travel and influx of refugees?

Absolutely. As more people travel the world, diseases typically relegated to the tropics have been encountered in other areas of the world. Usually this is because the disease was acquired on the trip but the incubation period allowed the traveler time to return home where the disease then manifests itself. A good history should always inquire about recent travel history of the patient to help identify these conditions in a timely manner.

What are some of the major infectious diseases in the tropics?

Specific illnesses will vary by location: hepatitis A, hepatitis B, malaria, typhoid fever and yellow fever. Traveler's diarrhea is a well known affliction to travelers in many parts of the world, not just the tropics, and is usually caused by strains of *E. coli*. Other diseases include rabies, dengue fever, and meningitis.

What is the impact of these diseases on the local population?

Diseases of poverty, as many of the tropical diseases truly are, contribute to the cycle of poverty. These diseases were once common in temperate climates but have been wiped out due to the public health measures of wealthier nations. For example, malaria and yellow fever were once present in the US but are now virtually unheard of in people without a history of travel. The impact of these diseases on the local populations is severe, as they lack the healthcare resources to help prevent and/or treat these infections.

What advice would you give someone who plans on traveling to a tropical area?

Plan ahead, and seek consultation from a travel medicine specialist early. Vaccines often need to be given several weeks to months in advance of travel to be maximally effective. Check out the CDC website which contains current information regarding local infectious diseases, recommended vaccines, and other prevention and treatment strategies. If possible, contact someone who lives in the area or who has traveled there so you can be prepared on what to expect. Check with the State Department's website on the political situation of the travel destination and purchase travelers/evacuation insurance if necessary.

Check out the CDC website

cdc.gov/travel

–and the–

State Department website

travel.state.gov

before you travel!

What things can be done to keep a traveler safe and healthy in these environments?

Good hygiene always helps reduce conditions such as traveler's diarrhea. Use water purification and stick to personally treated water or carbonated beverages. Following recommended vaccine schedules and antimicrobial prophylaxis such as for malaria will also help. Allow yourself proper time for acclimatization prior to any vigorous undertaking in the tropical rainforest. Understand how local diseases are acquired —walking around barefoot for certain parasites for example — and by using insecticides and insect repellants in addition to wearing proper clothing to provide a physical barrier.

Other than infectious diseases, what other problems are common to travelers in these locations?

Travelers in the tropics also need to be aware of other conditions such as dehydration and heat illness. Motor vehicle accidents are another major problem. Culture shock can be seen in those unused to travel; reverse culture shock can also be seen upon returning home in those who spend prolonged periods of time immersed in a different culture.

WILDERNESS MEDICINE

E-NEWS AND MORE

Compiled by Nancy Pietroski, PharmD

It May Take Two

Dey Pharma, LP, announced that they will exclusively offer the EpiPen 2-Pak and EpiPen Jr 2-Pak (epinephrine) Auto-Injector 0.3/0.15 mg, to encourage physicians and patients to follow anaphylaxis recommendations by the National Institute of Allergy and Infectious Diseases and World Allergy Organization to repeat the epinephrine dose in 5 to 15 minutes if symptoms are ongoing or progressive.

CLICK HERE

References: (NIAID): Boyce JA, Assa'ad A, Burks AW, et al. Guidelines for the diagnosis and management of food allergy in the United States: report of the NIAID-Sponsored Expert Panel. J Allergy Clin Immunol. 2010;126(6 suppl):S1-S58. (WAO) Simons FE, Ardusso LR, Bilo MB, et al; World Allergy Organization. World allergy organization anaphylaxis guidelines: summary. J Allergy Clin Immunol. 2011;127(3):587-593. e22.

Babesiosis Without the Bite

Infections caused by the parasite *Babesia microti* (or *B. duncani*) can range from asymptomatic to life-threatening, including flu-like symptoms to multiorgan dysfunction. Babesiosis, most commonly caused by bites from *Ixodes scapularis* ticks has been found to be increasingly transmitted by transfusions (although in low numbers). First identified in 1979, a recent report from the CDC found that 77% of cases occurred between 2000 and 2009. Note: a history of babesiosis renders one not eligible to donate blood.

CLICK HERE

Wilderness Medicine for the Original Wild Man

Dr. Grant Lipman, an emergency medicine physician at Stanford and WMS member, served as medical director for "I, Caveman," a Discovery Channel show (first aired on October 2nd) about modern-day men and women living as our ancestors did 20,000 years ago. Filmed at 9,000 feet in the Southern Rockies, the cast and crew were tended to by Dr. Lipman for a variety of ailments – an infected cut from an obsidian spear tip, hypothermia, leech wounds, twisted ankles, and altitude sickness – albeit with more modern methods than our forebears employed.

CLICK HERE

Meeting Medical in McMurdo

Students in the Rural and Wilderness Medicine Department at Rocky Vista University in Parker, CO have been communicating with a medical team at McMurdo Base in Antarctica through video conference, which also gave access to medical schools throughout the country. McMurdo Medical Director Dr. Douglas Freer and team gave the students an inside look at practicing medicine in one of the most austere of austere environments.

CLICK HERE

There's 10 Apps for That

This article reviewed 10 free "life-saving" iPhone and Droid apps that include disaster readiness, pocket first aid and CPR, pet first aid, and "Escape Call," to get you out of that emergency social situation – a really bad date.

CLICK HERE

And Now Presenting #397....

Great Falls in Paterson, NJ is the 397th addition to the National Park Service System. While the 77-foot falls and surrounding area of Great Falls needs work to meet NPS standards, the funds have been allocated for this park to become a new national treasure. See the rest of the article for descriptions of 6 less well known NPS parks and monuments and hit the road for a dose of history and adventure!

CLICK HERE

Overmining Won't Undermine The Grand Canyon...For Now

Douglas Brinkley (see *The Wilderness Warrior* book review on page 32) wrote an editorial in the *New York Times* about the Interior Department's proposed extension of the moratorium on filing of new mining claims on 1 million acres surrounding Grand Canyon National Park to 20 years. Foreign and domestic companies clamoring to extract uranium from the national forest have tried to invoke an 1872 mining law that allows free access to public lands, and they don't have to pay royalties to the US. Brinkley suggested that the Obama administration should invoke the 1906 Antiquities Act to preserve the forest and lands around the Grand Canyon as a national monument, thereby setting them aside for perpetuity.

CLICK HERE

Wilderness Medicine, 6th Edition

became available in December 2011. Edited by Paul S. Auerbach, MD, FACEP, FAWM, this updated edition has online access to the text's contents at www.expertconsult.com. Order "The Bible of Wilderness Medicine" soon; it will be an essential part of your library. (2304 pages, cost approximately $200).

CLICK HERE

Wilderness and Rescue Medicine: A Practical Guide for the Basic and Advanced Practitioner

Also in its 6th edition, will be available in January 2012. Authored by Jeffrey Isasac, PA-C and David Johnson, MD, this guide for the basic and advanced practitioner focuses on the practice of medicine in remote or challenging environments. (275 pages, cost approximately $65).

CLICK HERE

Photo by Seth C. Hawkins

Dispatches

from the field

Seth C. Hawkins, MD, FAWM

A tractor trailer loaded with I-beams lost its brakes on an extremely remote stretch of highway in the Pisgah National Forest, North Carolina, just outside of the Linville Gorge Wilderness Area. The truck went through two sand banks and launched, at one point reaching a vertical height of about 20 feet, based on tree damage, into a sheer dropoff. We responded to find the patient trapped in a crumpled cab completely detached from the truck, forming a little space capsule, literally in a field of I-beams. We secured the I-beams as best we could, but at any moment I was afraid the whole field would dislodge and I'd lose all my medics/rescue personnel along with the patient. It was like working in an avalanche field.

We worked for over 4 hours to extricate him in the middle of the night amidst the I-beams. My Wilderness EMS Extern, Ben Abo, ran the medical command for the whole operation. (See page 31 for a description of the Carolina Wilderness EMS Externship.) There were all sorts of heartwrenching human moments as these guys tried to comfort the pinned driver and get him through it, all the while overcoming their own fears about our operational safety. The most compelling visual picture I got was of the driver's hand and IV'd arm, reaching out from the cribbing in the middle of the wilderness, grasping the gloved hand of Trey Sinker, one of our rescue personnel, also a medic student. As I coached Ben in his role as medical command, my medics were coaching Trey in his role as primary medic. But nobody needed to coach Ben and Trey in their instinctive, humane responses to comforting the patient. Hurst, the corporation famous for making the "Jaws of Life," awarded everyone on the scene the Green Cross Award for this operation.

See page 24 for a description of the new **Wilderness EMS Medical Director Course**, supporting healthcare providers who are asked to provide medical oversight to EMS systems operating in austere or resource-deficient environments.

FOOTPRINTS FOR KIDS:

Can you hear me now?

Communication Skills for Kids in the Wilderness

Debra Stoner, MD, FAWM
Photos by Debra Stoner

The Z Generation would be better called the IC (Instant Communication) Generation. A false sense of security has developed in this generation, owing to the ease of communications in urban and suburban environments. Teaching basic wilderness communication skills is essential should a child become separated from her group or the adult in charge becomes ill or injured. Before leaving home, practice using the equipment so they know how to use a device and develop problem-solving skills by using scenarios to build confidence.

Whistle a Tune

The most basic skill, especially with younger children, is to keep everyone within voice and sight range. Make this a non-negotiable rule. However, it only takes a minute of stopping to pull out a snack for a kid to be out of voice range. Voices also fatigue easily so equip each child with a survival whistle. Pin it directly to the clothing of young children, being sure they can get it up to their mouths. Older kids can wear it on a lanyard tucked into their shirt to avoid entanglement.

Three consecutive sounds are internationally recognized as a distress signal. Teach children to blow on the whistle three times repeatedly with a pause in-between the serial blasts when lost, injured or needing help.

Mobile Radios

Two-way radios offer several options depending on the type. FRS, Family Radio Service, operates at 0.5 watts of power and transmits on a total of 14 channels (7 of its own and 7 shared with GMRS). GMRS, General Mobile Radio Service, commonly offer 1 to 5 watts of power and transmit over 22 channels including the 7 FRS channels. The higher wattage allows for a longer transmission range. Some radios are a combination of FRS and GMRS channels. A license is required with the Federal Communications Commission to operate the GMRS bands. When operating a hybrid radio using both FRS and GMRS understand which channels are exclusively FRS or licensed for GMRS.

These radios work best if you are in clear line-of-sight or mountaintop to valley terrain. Consider when reading a manufacturer's claims for range that vertically challenging terrain, thick clouds, lightening and dense forests can impede signals. Generally the range is two miles or less for low wattage units. Gaining elevation boosts transmission potential by overcoming obstructions and the earth's curvature. Higher wattage improves signal quality.

Cell Phones

Falsely relied on by the untrained public in wilderness areas these fail when the batteries run down or they fail to connect to a cellular network. Teach kids how to switch to "airplane mode," or similar modes which convert unit from phone to PDA, and activate only when needed. This mode prevents the phone from constantly searching for a tower connection, which wears down the battery. This can improve battery power from hours to days. If weight allows, carry an extra cell phone battery or solar charger.

> A false sense of security has developed in this generation, owing to the ease of communications in urban and suburban environments.

Texting is an option when connectivity is marginal. A text will transmit with only 1-2 bars of signal strength. Turn the phone off and wait 15-30 minutes before turning on again to give the receiver an opportunity to respond and plan.

Certain cell phones also offer GPS tracker capability that can aid SAR teams in locating an individual. Cell phones are a good option in areas such as ski resorts.

Personal Locator Beacons

Although the more expensive option, PLBs offer a unique number that is registered with the national or international satellite locator system. The 406 MHz beacon system with GPS-enabled units is replacing the older systems. Registration provides SAR services with information such as a description of the person and phone numbers for emergency contact. PLBs are for land-based operation.

Here is how they work: the device is manually activated and one or more satellites recognize the transmission. The satellite transmits the signal to ground control where it is processed and forwarded to a national authority who then notifies a local rescue authority. Additional receiving apparatus is used to locate the beacon and initiate local SAR operations.

Considered a safety device for emergency use, these can be a means of communication especially for older kids. Some devices have options for the registered owner to just "check in/OK" allowing family to know their location and status. These devices come with a yearly contract, fees and stipulations for canceling services. Other PLB devices are simply used as a GPS messenger for rescue. You buy the device, register and use as needed without a specific company contract. The cost up front may be more for these devices but the services are the same and the registration is free. In the USA NOAA accepts registration for the 406 MHz beacons. Know your units battery life and carry extra batteries or a charging device.

No matter what system you choose consider a backup especially when depending on electronic systems, which can be damaged by falls and the environment. As always the most important gear you can give children is knowledge: it weighs nothing, doesn't take up pack space and may save their life.

Trail Mix:

Nutrition for Adventurers

Katie Wewer, MS, RD, CD

When you share good trail mix, you have instant friends. My husband and I are almost never caught without having some sort of trail mix in our pockets or backpacks. Whether we are in the ski gondola on our way to more powder turns, taking a break at a pristine lake, or on the summit of a mountain, we eagerly pull out the snacks and share our GORP with anyone who needs a little boost. His favorite: peanuts, almonds, M&M's and chocolate chips. My favorite: cinnamon sugar roasted almonds and pecans, dark chocolate covered pomegranates, yogurt covered raisins and pretzel nuggets.

GORP has come a long way since just "Good Ole Raisins and Peanuts." There are so many options available and so many different combinations that you can put together to make your own delicious and energy packed snack. I like to mix something sweet, something salty and something chocolate-y to satisfy all of my taste buds. Including a good mix of carbohydrates (fruits, cereals, chocolate) for energy, protein (nuts, seeds) for recovery, fat (nuts, seeds, chocolate) for satiety, and fiber (cereals, nuts, seeds, fruit and vegetables) for satiety, blood glucose control and a happy digestive system is essential.

We thought we would give you a few fresh ideas to add to your favorite trail mix. Choose foods that won't melt in the summer or get too smashed or broken if they make their way to the bottom of your pack. Mix and match the foods that sound good to you, put in a zip-top bag, stir or shake to combine and be on your way to your next fun filled adventure.

Fruits and vegetables

Freeze dried or dehydrated fruit and/or vegetables such as apples, pears, apricots, bananas, prunes, peaches, figs, crystallized ginger, mangoes, papayas, pineapples, coconuts, strawberries and other berries, craisins, raisins or corn, peas, carrots, sundried tomatoes, Cajun roasted corn, etc. Freeze dried fruit and vegetables can be found in bulk from food storage companies such as Shelf Reliance or Harmony House Foods, Inc., or in smaller packages from Just Tomatoes Etc! or Crispy Green. You can also find them in bulk bins of your local grocery or natural food store. Homemade dehydrated fruit is a favorite that doesn't have added sugar like some store bought foods do. Fruits and vegetables are great for vegan, gluten free and high fiber diets.

What is your favorite trail mix combination? Send us your ideas to jonna@wms.org

Nuts and legumes.

Nuts and legumes like peanuts, almonds, cashews, walnuts, pine nuts; and seeds like pumpkin, sunflower, sesame, and chia that can be found raw, roasted or salted. Some nuts and seeds can be found spiced with curry, Cajun or Indian spices or sweetened with cinnamon and sugar. Sesame sticks are found in several different flavors as well and add a nice crunch to your mix. A few savory options are wasabi peas, wasabi peanuts and roasted and spiced garbanzo beans.

Chocolates.

Chocolate treats (best when kept out of the sun or heat) like M&M's, peanut or peanut butter M&M's, pretzel M&M's, Reese's Pieces, dark or semi-sweet chocolate chips, Brookside dark chocolate covered pomegranates or acai with blueberries, chocolate covered coffee beans, etc. Trader Joe's has dark chocolate covered ginger that would add a nice touch to your trail mix and give you that warm, fuzzy feeling. Carob chips are a vegan alternative.

Cereals and starches. Carbohydrate rich snacks like pretzel nuggets, peanut butter filled pretzels or Goldfish pretzels, Kashi Honey Toasted Oats or Honey Puffs, or other cereals or granolas add some crunch to your mix.

High fiber foods.

Wheat or Multi Bran Chex (6 g fiber/serving), Kashi Go Lean Crunch (8 g fiber/serving) and Cinnamon Harvest (5 g fiber/serving) cereals are a few high fiber options that will keep their shapes in most packs (usually). Look for at least 5 g fiber/serving up to 14 g fiber per serving. Fruits, vegetables, nuts and seeds are also good sources of fiber.

Gluten free cereals.

Chex has several gluten free cereals that make crunchy additions to a gluten free trail mix: rice, corn, cinnamon, chocolate or honey nut Chex cereals are all gluten free as well as Barbara's Cinnamon Puffins. Raw nuts, fruits and vegetables are naturally gluten free.

Sweets.

Gummies like 100% fruit juice snacks or electrolyte enhanced gummies such as Clif Shot Bloks (quartered), Gu Chomps or similar products add candy-like sweetness to your trail mix.

Katie Wewer graduated from the University of Utah with an MS in Food and Nutrition where she now co-teaches a course on Wilderness Nutrition.

Sweet: Cinnamon Harvest cereal biscuits, dehydrated or freeze dried apples, cinnamon sugar walnuts, dark chocolate chips

Savory: Sun dried tomatoes, wasabi peas, wasabi peanuts, cashews and pumpkin seeds, sesame sticks

High Fiber: Wheat Chex (6 g fiber per 3/4 cup), prunes (1 g fiber per prune), dried apricots (1/2 g fiber per dried apricot), nuts (~2-3 g fiber per 1/4 cup)

Gluten Free: Chocolate Chex, Cinnamon Chex, almonds, dried cherries

Caffeinated: Chocolate covered coffee beans (10-20 mg caffeine per bean), cherry flavored Shot Bloks, quartered, (50 mg caffeine/3 shot blok/serving), pretzel nuggets, peanuts

RECIPE

Katie's Cinnamon Sugar Roasted Nuts

Ingredients
1 egg white
1 tsp cold water
½ cup sugar
1 Tbsp ground cinnamon
¼ tsp salt
4 total cups of nuts: whole almonds, walnut halves, hazelnuts and/or pecan halves

Directions
1. Preheat oven to 250° F. Coat a baking sheet with cooking spray.
2. In a medium-sized bowl, lightly beat the egg white, then add the water and beat again lightly.
3. In a small bowl, mix the sugar, cinnamon and salt together.
4. Add the nuts to the egg white mixture and combine until the nuts are well coated. Then sprinkle the sugar mixture over the nuts and mix again until well coated.
5. Spread the nuts evenly onto the baking sheet.
6. Bake for 1 hour, stirring occasionally. Cool for about 30 minutes before eating.

Makes about 16 x ¼ cup servings.

Nutrition facts per serving:
210 calories, 18.5 g fat, 8 g carbohydrates, 3 g fiber, 5 g protein

Wilderness EMS Medical Director Course

Seth C. Hawkins, MD, FAWM

You never expected that blind hairpin turn after you launched off the log. The snapping you heard as you crashed through the trees wasn't all just branches, and now here you are with an obvious femur fracture. You and your buddies did everything right, splinting the injury, minimizing the movement, writing a SOAP note, and calling for help. Now a well-trained and equipped Wilderness Emergency Medical Services (EMS) team is on its way to your rescue…right?

Despite the growth of wilderness medicine in general, some EMS systems, even in areas with high outdoor activity usage, are ill-prepared to respond to wilderness emergencies. Underfunding, jurisdictional issues, undertraining, and lack of attention can all contribute to a meager formal rescuer response during your next wilderness emergency.

By law all EMS personnel, whether in the front country or backcountry, must operate under the medical oversight of a licensed physician. However, until now there has been no specific training for physicians to provide this type of oversight.

EMS is now the newest medical subspecialty recognized by the American Board of Medical Specialties and increasingly many physicians lack EMS training, wilderness training, or both. Often wilderness EMS requires additional logistics, training, equipment, and protocols that exceed the preparations they and their medical directors have made.

To address this issue, the Wilderness EMS Medical Director Course was developed to support healthcare providers asked to provide medical oversight to EMS systems operating in wilderness (austere or resource-deficient) environments. The course is specifically engineered to benefit all these physician types and degrees of preparation. It assumes no prerequisites.

The course was designed by Michael Millin, immediate past medical director of the National Ski Patrol, Seth Hawkins, medical director for Linville Gorge, and Will Smith, medical director for Grand Teton National Park, Teton County Search & Rescue, and National Park Service-SE AZ Group. The underlying curriculum was originally developed by Millin using Delphi methodology* for scientific rigor.

Importantly, each is a member of both the National Association of EMS Physicians (NAEMSP) and the Wilderness Medical Society (WMS), both of which agreed to support the course. As the first joint NAEMSP-WMS project, the course represents an important historical installment in the development of Wilderness EMS as a specialty.

The first course version was rolled out in Tucson, AZ at the November 2011 Wilderness Medical Society Desert Medicine. Over 40 participants graduated and offered rave reviews of the content, as well as great ideas for future improvements. Speaking to the relevance of this topic, in the first class, 30% of enrollees already considered themselves WEMS medical directors, and 25% were not WEMS medical directors but had specific plans to assume this role. The course is anticipated to be offered at upcoming NAEMSP and WMS conferences in the future.

Course content includes the historical development of EMS and wilderness medicine, on- and off-line medical oversight, logistical considerations in systematic EMS response to wilderness areas, protocol and EMS system design, a review of the state of the art in the field care of specific emergency medical conditions, legal issues in WEMS, and roles that physicians can play in WEMS oversight.

WEMS Medical Directors faculty and students at the November 2011 Tucson course.

Drs. Will Smith, Seth C. Hawkins, and Michael Millin.

DELPHI METHOD is a structured communication and scientific research tool originally developed by the RAND Corporation in Santa Monica, CA in the 1950s. It uses a panel of experts who produce expert opinion anonymously and initially without access to each other's opinion, in multiple rounds of consensus opinion generation, with the goal at ultimately arriving at the "correct" expert consensus opinion that minimizes participants "losing face" or bowing too quickly to the loudest (but perhaps not most accurate) voice.

Wilderness EMS
Medical Director Course

{About the Logo}

The WEMS Medical Director Course logo consists of several hidden or symbolic meanings. It incorporates the top right half of a medical cross; it also loosely represents the structure of a leaf and, through use of color, suggests the blue cube is being "supported" by the green shapes. The Green symbolizes Wilderness EMS and the blue symbolizes medical doctors. The dark green in the middle is a mathematic average of the two lighter colors (suggesting a symbiotic relationship) and helps create the illusion of depth even though we are looking at flat shapes.

MEMBERS IN THE NEWS

WMS Member ***Yvonne Lanelli*** won an award at the annual Communications Contest sponsored by the New Mexico Press Women this past summer. The article "Take Your Apple Skiing – and Other Nutrition Strategies" featured in the Winter 2010 issue of this magazine won second place in the Physical Health and Fitness category. She also won several other awards at that contest for other articles she wrote in 2010 including two first place finishes which went on to a national competition. One of those articles won first place at the national level! Congratulations Yvonne from everyone at WMS!

Justin Padgett EMT-P was the recent recipient of the Mountain Laurel Award for 2011, presented by the directors of the Appalachian Center for Wilderness Medicine (ACWM) at their yearly meeting in Fayetteville, West Virginia. This award recognizes outstanding contributions to the field of wilderness medicine by an individual or group in the southern Appalachian region.

Justin founded Landmark Learning in 1996, which has been a respected provider of wilderness medicine courses in the southeast for years, educating thousands of students in wilderness medicine courses. "Padgett is a dedicated, experienced and remarkably innovative wilderness medical educator and practitioner," says Dr. Seth Hawkins, ACWM Executive Director and fellow WMS member. "We are proud to have him in our southern Appalachian region, and even more proud to be able to recognize the caliber of his work with this award."

IN MEMORIAM

Joseph Miles Abell, Jr MD

Joseph Miles Abell, Jr, MD. Longtime WMS member, Joseph M. Abell, Jr., 79, died at home October 17, 2011 of amyotrophic lateral sclerosis. He received his medical degree from Baylor College of Medicine in 1957. For the next five years, Dr. Abell served his internship and his surgery and orthopedic surgery residency at the University of Michigan, Ann Arbor. He moved to Austin in August 1962, founded Austin Orthopedic Clinic and practiced orthopedic surgery in Austin until 2007. During his first 25 years in Austin, his practice was concentrated mainly at Brackenridge Hospital, where he lectured to student nurses, firefighters, and the first Emergency Medical Service trainees. He was a Fellow of the American College of Surgeons, a Diplomat of the American Board of Orthopedic Surgery, and a Fellow of the American Academy of Orthopedic Surgeons. Those wishing to contribute to ALS research may do so with a gift to the Mary and Joseph Abell Fund for ALS Research and Care, Austin Community Foundation, 4315 Guadalupe, Ste 300, Austin, Texas 78751.

Matthew Curley, MD

Matthew Curley, 28, while diving with a guided group off the south shore of Oahu, disappeared at sea on August 29, 2011, and is presumed dead. The US Coast Guard used two ships and airplanes to cover a 900-square mile radius, but were unsuccessful, and the search was suspended after four days. Dr. Curley was a 3rd-year resident in Emergency Medicine at St. Luke's Roosevelt Hospital in New York City. Curley graduated from Bucknell University and New York Medical College. A scholarship fund was created in Dr. Curley's name to support residents who share his interest in wilderness medicine. Contributions can be sent to Attn: Matt Clark, MD, Program Director, Emergency Medicine Residency, St. Luke's-Roosevelt Hospital Center, 1000 10th Ave, New York, NY, 10019.

WMS RESEARCH GRANTS

The Research Council is accepting Grant Applications for the 2012 WMS ResearchGrants.

- The Charles S. Houston and Research-in-Training Awards are selected on a competitive basis to provide funding for a research project in the field of wilderness medicine.
- The Charles S. Houston Award is for medical students and the Research-in-Training Award is for residents and fellows of an accredited graduate medical education program or doctoral candidates working towards a PhD.
- The Herbert N. Hultgren Award is for members of the WMS.
- The Humanitarian Aid Grant was developed in response to the January 2010 Haitian earthquake in an attempt to support WMS members involved in humanitarian and disaster response efforts. However, the Humanitarian Research Aid Grant applications will be considered for projects worldwide, regardless of country.

For information, an application, and instructions on how to submit a Research Grant to: wms.org/research/default.asp.

CLIFF NOTES ALI ARASTU, MSIII

KECK SCHOOL OF MEDICINE,
UNIVERSITY OF SOUTHERN CALIFORNIA

Greetings fellow students! I hope this winter edition of the WM magazine finds you all well. Whether you're flying down slopes in high mountains, climbing some awe-inspiring ice, or just thinking about being in any wilderness while working away in a hospital ward for a clerkship, I sincerely hope you are stoked.

For those of you looking for an amazing opportunity to learn all that encompasses wilderness medicine, get ready for the annual WMS Wilderness & Mountain Medicine Conference Meeting in Park City, Utah. The conference will be from February 4th thru the 8th; if you are interested in being a student volunteer at the conference, please let me know at the email below as a few openings still remain.

As always, please share stories of what is happening with wilderness medicine at your schools. Also, if you have any suggestions on what WMS can do for you and your student groups, or want to get more involved with WMS itself, I would love to hear from you. Contact me at **wmsstudentrep@gmail.com.**

Ali's fellow students sharing conversation and brews at the 2011 Summer Conference in Snowmass.

GREAT GEAR:

Outdoor Adventurers Behold:
Nikon's new AW series of waterproof, shock-proof, e-Compass and GPS digital camera

Brad L. Bennett, PhD, FAWM

This is a new camera ideal for all SAR personnel and other wilderness adventurers. It is a great tool for SAR training and missions to document tracks, evidence, clues and last known place, for example. The Nikon COOLPIX AW100 is water-proof, shock-proof and freeze-proof, so you can take it on all of your extreme adventures. It packs a 5x Zoom-NIKKOR ED glass lens and a 16.0-MP CMOS sensor to record low-light and fast-action photos and Full HD (1080p) movies. Life on the road deserves GPS + e-Compass, so the AW100's got these too. Add a 3-inch monitor, the new Action Control for easily adjusting settings when wearing gloves plus a range of in-camera special effects, and you've got a camera as rugged as you. The AW100's rugged waterproof build can take the pounding action while you record photos and movies of your incredible adventure, and its built-in GPS can track your progress with Nikon View NX2 software, Nikon's mypicturetown photo sharing site or Google Earth. Its built-in map lets you view your path, and its electronic compass is an extra safety measure that can even help you decide which branch to take if there's a fork in the stream. Your GPS travelogue will give you bragging rights as you share the adventure with your friends. Comes in three colors and retails $379.95.

CLICK HERE

Water Purifiers Go Light, Compact

Christopher Van Tilburg, MD, FAWM

Finally, field water disinfection has become lighter, more compact. Never did I notice this more than when I had to pack for a week in rural Haiti in a Patagonia MLC pack and a trip to the Peru's Inca Trail with one bag, including a sleeping bag and pad. No room for extraneous gear or bulk.

Traditional filters have 0.4 micron pores to remove protozoa and bacteria. I tested the Sawyer inline waterbottle filter. Unfortunately tiny viruses are small enough to escape capture. On a trip to Peru I used the Katadyn's MyBottle, with 3-stage ViruStat purification technology including 0.3 micron microfilter, iodinated virus-toxic resin, and a charcoal filter to remove chemical taste…all in a bike-cage-compatible water bottle. In October, Sawyer's already proven squeeze filter system will get upgrade to a 0.02 micron viral filter. And it will clock in at about 6 ounces—a boon for us weight weenies.

Of course, when all else fails, you can use what is typical for municipal water supplies world round: chlorine. Katadyn's MicroPur tablets are ultralight, ultracompact, inexpensive and provide total disinfection. A tablet in a liter nukes Inca llama-tainted agua or Haiti's cholera. You just need let 4 hours pass for the tablets to kill microbes and the slightly icky taste. But, that's better than the alternative.

Scandinavian Society of Wilderness Medicine

Benjamin Lischner, MD, FAWM

In September 2011, the Scandinavian Society of Wilderness Medicine held the first European AWLS course in Abisko, Sweden. Abisko is a national park 200 km north of the Arctic Circle.

The course was led by Emil Peclard, MD, with the help of Monica Iversen, MD, Dafinn Eilertsen, EMT-P, Elin Nissilä Källström, MD, Erik Svensk, MD, Henrik Hedelin, MD, Sverre Håkon Evju, MD, Katrine Finsnes, MD, FAWM as well as myself. Dr. Rich Ingebretsen of Salt Lake City, Utah came to supervise our instruction and certify all the instructor candidates. We had 17 course attendees from Sweden, Norway, Finland and the UK.

Scandinavia could be a good focus for future recruitment! We will more than likely hold our second AWLS course in March, 2012 in Narvik, Norway, presenting another opportunity for recruitment.

Outdoor Medicine: Wilderness Medicine in "The Lowlands"

Michiel van Veelen, MD

Outdoor sports, mountains or even national parks might not be the first things that come to mind when you think of The Netherlands. However, the Dutch are keen travelers and outdoor sports enthusiasts.

Until about a year ago, there was no organized form of wilderness medicine in The Netherlands. For that reason we founded the Dutch Expedition & Wilderness Medical Society, which goes by the name: Outdoor Medicine. The primary aim is to provide a centre of knowledge for medical professionals, outdoor sports associations and expedition groups.

The latest projects that Outdoor Medicine has conducted include the medical support of a Dutch NGO on an expedition to the Nicaragua jungle for a development project. Outdoor Medicine actively participated in the preparation by educating the group on local health risks, teaching hands-on experience in wound and fracture management and training scenarios in Basic Life Support. On location an extensive medical kit and telemedical advice was given by phone.

At the moment, a first aid course for kite surfers is being developed together with the Dutch Kitesurfing Association.

Furthermore, Outdoor Medicine provides an opportunity for doctors to certify themselves in Advanced Wilderness Life Support (AWLS). The first course in The Netherlands is planned for April 2012.

Photos courtesy of Ben Abo.

Carolina Wilderness EMS Externship

Seth C. Hawkins, MD, FAWM

One of the newest Wilderness EMS electives recently took flight in North Carolina. The Carolina Wilderness EMS Externship is a joint venture of Burke County Emergency Services, Blue Ridge HealthCare, Western Piedmont Community College, and UNC-Chapel Hill's Department of Emergency Medicine.

The Carolina Wilderness EMS Externship differs from most wilderness medicine electives in that the emphasis is almost entirely on EMS activities, rather than general wilderness medicine. Externs each year are chosen from a pool of medical student and resident physician applicants.

The one-month course is based in Burke County, one of the most beautiful and rugged areas of the eastern United States. The county includes Linville Gorge ("The Grand Canyon of the East"), South Mountains State Park, and Lake James.

The course was completed in pilot form in June of 2011, with Ben Abo of Touro University, San Francisco, serving as the first medical student participant. "This month has proven to be one of, if not the most, defining times in my medical career," says Abo. "I have not only been able to thoroughly (and safely) challenge my abilities as a budding EMS/EM physician, but I have been able to learn and practice it under various conditions."

More information about the elective is available at **blueridgehealth.org**

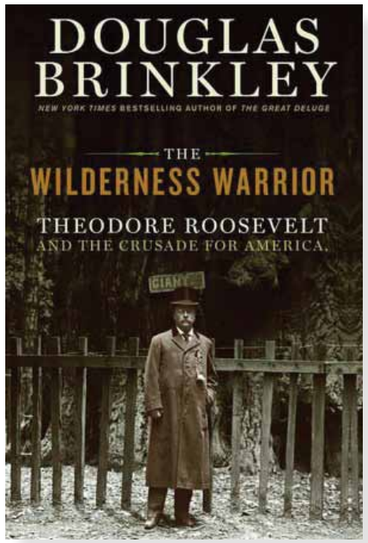
Seth C. Hawkins, MD, FAWM, Course Director, Carolina Wilderness EMS Externship, Burke County EMS, Morganton, North Carolina.

Book Review

The Wilderness Warrior:

Theodore Roosevelt and the Crusade for America

By Douglas G. Brinkley
New York, NY: HarperCollins Publishing; 2009



Do you know where your wilderness comes from? As told in this exhaustively detailed biography, a bullish 234 million acres was saved by the veritable bull of a man, President Theodore Roosevelt. By bullying Congress, mining and oil companies and other greedy detractors often by stating "I declare it so" – legions of national parks, forests, game preserves, monuments, and federal bird reservations among others were protected for Americans to cherish and in which to have their natural souls restored. Although TR was an animal lover – the White House had a wild menagerie of winged and 4-legged family members – he was also an avid hunter, which troubled his purist naturalist friends. Roosevelt had a long list of conservation successes especially in the last months of his presidency, furiously penning new acres and species into preservation; he also had a few failures, most notably his decision to cave to water demands of the West with the damming and flooding of Hetch Hetchy Valley in Yosemite, a heartbreak for his friend John Muir. Also, he also was unable to get the Grand Canyon designated as a national park due to lobbying by mining interests but was able to declare 800,000 acres off limits to development using the Antiquities Act of 1906 (it became a national park in 1919 after his death).

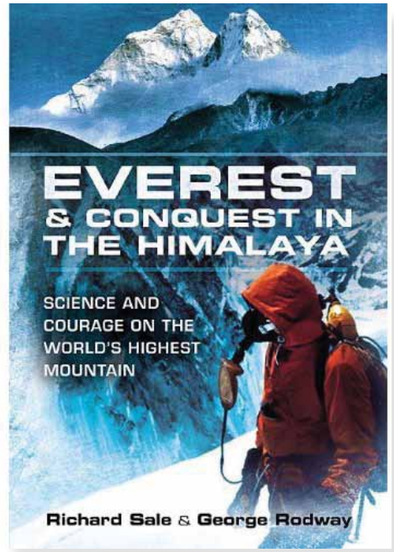
This book was very long – I was feeling a little guilty that it was taking this usually voracious reader forever to get through it (a 10-hour roundtrip car ride over Thanksgiving weekend helped finish it off). The book ended at the end of TR's presidency, but his conservation crusade lasted 10 more years until his death, so you'll have to read other biographies to get the rest of this history (*River of Doubt* was a riveting read). Curl up with this gargantuan book of over 900 pages (to suit its hero) on the long, dark winter nights that lie ahead. Or if you want to be a true conservationist, cozy up with the Kindle version ($2.99), although beware of footnote issues.

Reviewed by Nancy Pietroski, PharmD
Telford, Pennsylvania, USA

Everest & Conquest in the Himalaya:

Science and Courage on the World's Highest Mountain

By Richard Sale and George Rodway
Barnsley, South Yorkshire, UK: Pen and Sword Discovery; 2011.



Everest and Conquest in the Himalaya delves into the roots of climbing at extreme altitudes from the perspective of scientific discovery. Every successful alpinist has this pioneering science to thank for the elevations gained that so recently were thought unattainable. Multiple authors have written of mountaineering's history and a similar number of volumes explore hypoxic physiology, but Sale and Rodway's book is the first to pursue these two disciplines at their junction.

The opening chapters are filled with accounts of early field studies directed at understanding human adaptation and performance at altitude. The detailed discoveries and hardships of Bert, Pugh, and Younghusband on the great peaks are eye opening. This work provides intriguing insight into the struggles endured while first climbing these mountains, which often ended in failure and fatality. The unrelenting and inquisitive natures embodied by these hardy explorers captivate the reader. The photographic plates depicting these intrepid pioneers inspire gratitude for our modern down suits and synthetic double boots. Also sprinkled throughout the text are succinct information boxes that compliment each chapter with crisp descriptions of key people and the nuances of acute mountain sickness.

The authors make reference to some of the modern day absurdity occurring on these once austere mountains but are quick to redirect the focus back to the amazing feats that have and continue to happen in the high alpine arena.

The advancements in scientific knowledge that made 29,035 feet possible for Hillary and Norgay over 50 years ago are still informing the decisions of today's climbers. Without the painstaking study of humans at altitude chronicled in this text, we would still be wondering what it looks like at the top of our world. Sale and Rodway do a splendid job of dissecting the science of mountaineering in this witty and engaging read.

Reviewed by David Weber, WEMT-Paramedic, FAWM
Salt Lake City, Utah

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Based in Haiti at the Centre de Formation Lévêque, Verrettes, the MSM program includes lodging, meals, 26.5 CME credits. This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Education through the joint sponsorship of The Wilderness Medical Society and Medical Student Missions, Inc.

Students and professionals will work aside a world-renown faculty in travel medicine and global health, including, but not limited to the following:

> *Christopher Van Tilburg, MD,: Program Chairman, is Editor-in-Chief, Wilderness Medicine, author of nine books, Past Board Member of Wilderness Medical Society, and active member of Mountain Rescue Association.*
>
> *David Shlim, MD, is director of Jackson Hole Travel and Tropical Medicine, Editor of The CDC Yellow Book and President Elect, International Society of Travel Medicine (www.istm.org)*
>
> *Col. Alan J. Magill, MD, is Program Manager at Defense Advanced Projects Research Agency, Associate Professor of Medicine & Preventive Medicine & Biometrics at Uniformed Services University and Editor, The CDC Yellow Book. He is Past President of the International Society of Travel Medicine (www.istm.org)*
>
> *William W. Forgey, MD is founder of Medical Student Missions, Board Member of the International Association for Medical Assistance to Travelers (www.iamat.org) , and Past President of Wilderness Medical Society*
>
> *Dirk Vermeyen specialist in the role of leaf doctors and voodoo in local health care.*

The all-inclusive cost is $1,950, which includes transportation within Haiti, room, board and CME. The program will take place from January 21 to January 28, 2012. Visit the website for specifics on the CME topics and for a comprehensive list of what is included in the program, as well as accommodation information — www. medicalstudentmissions.org.

Medical Student Missions, Inc, is a 501(c)3 non-profit organization. All proceeds from this program support our mission to provide Learning through service opportunities for our volunteers to work alongside their Haitian counterparts in rural community health clinics.

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DiMM

DIPLOMA IN MOUNTAIN MEDICINE

The Wilderness Medical Society is launching an exciting new program in association with the University of Utah and the University of Colorado – the Diploma in Mountain Medicine (DiMM). The DiMM program is designed to train participants in the essentials of mountain medicine and rescue in technical alpine environments. This skill set crosses a multitude of disciplines including expedition medicine, search and rescue operations, mountain guiding, ski patrol and mountain recreationalists. *This Diploma meets the requirements put forth by UIAA, ICAR and ISMM.*

FOUR 1-WEEK SESSIONS, SPACED OVER 1 – 2 YEARS, INCLUDE:

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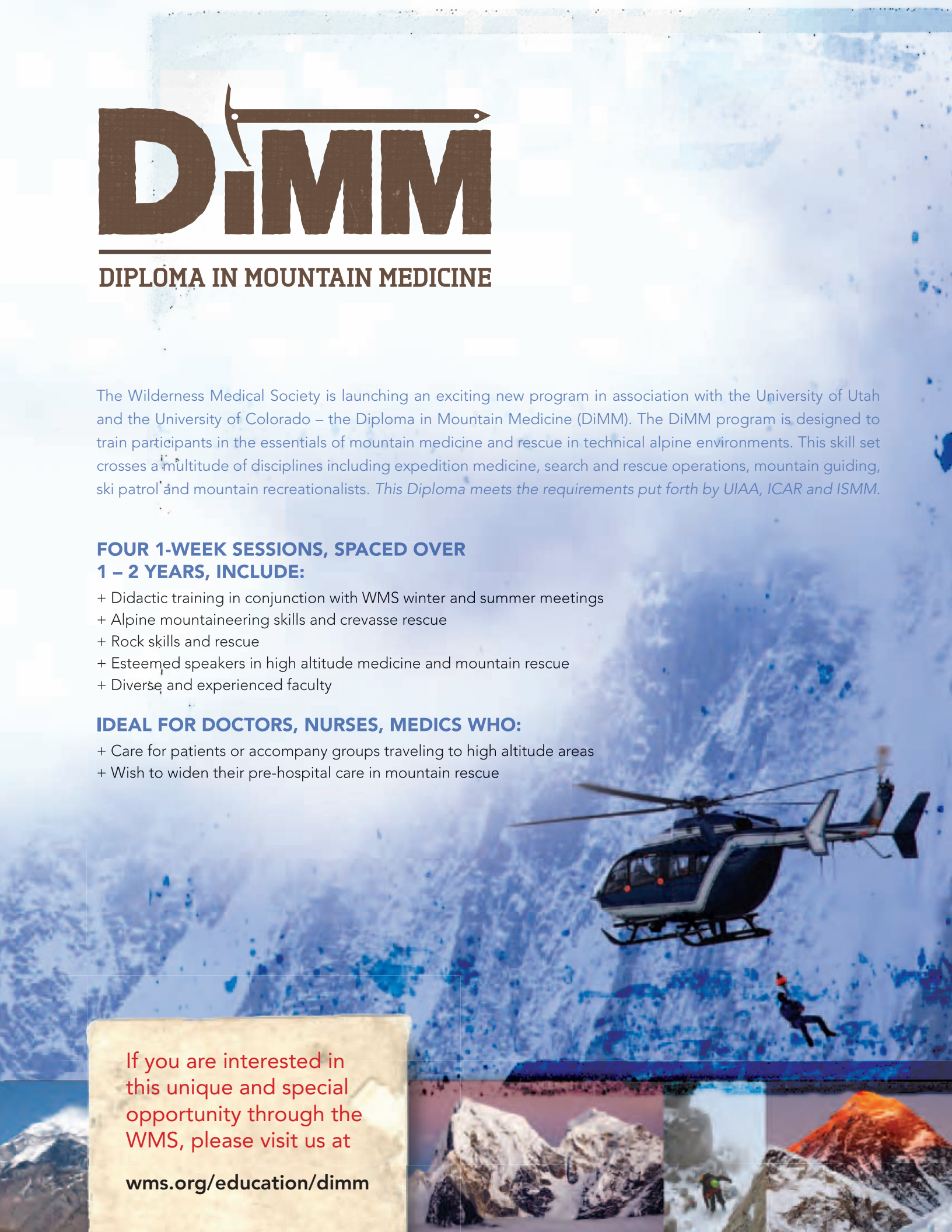
+ Alpine mountaineering skills and crevasse rescue
+ Rock skills and rescue
+ Esteemed speakers in high altitude medicine and mountain rescue
+ Diverse and experienced faculty

IDEAL FOR DOCTORS, NURSES, MEDICS WHO:

+ Care for patients or accompany groups traveling to high altitude areas
+ Wish to widen their pre-hospital care in mountain rescue



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