THE WILDERNESS INSTRUCTOR

An Introduction to the Medical Wilderness Adventure Race (MedWAR)

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First-aid competitions have a long history. For example, the American Red Cross helped publicize its first-aid classes (which began in 1910) by holding first-aid contests all over the United States.[1] These contests are still held in some states, though they have become much less common. St John Ambulance also has a long tradition of first-aid competitions, going back more than a century. St John Ambulance, like the Red Cross, is a volunteer-based organization that provides first-aid services and training. It was founded in Canada in 1882 and now has branches in many other countries, including Great Britain, Australia, and Austria. Volunteers from St John Ambulance and the Red Cross participate in both national and European first-aid competitions. These competitions are much more popular and better publicized than the relatively few remaining competitions in the United States. (For more information about this topic, do Google searches on first-aid competitions and St John Ambulance.)

The Medical Wilderness Adventure Race (MedWAR) revives an old tradition and gives it a new context. Wilderness emergency care courses often include realistic scenarios in an outdoor setting, and any role-playing scenario includes a competitive element, though participants are generally competing against a standard of performance rather than each other. Scenarios also usually require teamwork, which instills camaraderie in the participants. MedWAR not only puts emergency care competition into a wilderness setting, it also adds to the challenge by having the simulated emergencies occur during a wilderness activity, such as hiking, mountaineering, or canoeing. Thus, participants are tested on wilderness as well as emergency care skills.

This strategy has already attracted several wilderness organizations, such as the Boy Scouts, and should lead to alliances with many other organizations. For example, the National Ski Patrol, the Civil Air Patrol, mountain rescue teams, search and rescue teams, park medics, survival schools, and wilderness guides are all potential participants; collaboration with such organizations could also lead to cross-training.

MedWAR events can be made very realistic by the use of moulage (accident make-up).[2] Realistic simulation of injuries, along with effective acting-out of symptoms (and the real wilderness setting) can give MedWAR problems the physical and psychological impact of real wilderness emergencies. Moreover, effective acting by well-coached victims can largely eliminate the need for written exams. For example, a victim can simulate many of the symptoms of altitude illness (eg, fatigue and shortness of breath for high-altitude pulmonary edema) with the disembodied voice of a monitor supplying the data that cannot be simulated (eg, ''Pulse is 110'' [when the rescuer checks pulse] and ''You hear crackles'' [when the rescuer listens to lung sounds]). And if the scenario is not actually at high altitude, the scene can be set with a sign on a hill top (eg, ''Mt Whitney, 14 000 feet''). In other words, whatever the victim cannot simulate can be provided by visual or auditory cues, which enable the rescuers to stay in their roles and the monitors (by convention) to remain invisible.

In summary, MedWAR events have the potential not only to test the skills of wilderness rescuers, but also to stimulate interest in wilderness emergency care, create alliances with many wilderness organizations, and even generate publicity that can greatly enhance both recruiting and fund raising for volunteer organizations.

References

1. American Red Cross. *Brief History of ARC First Aid Program.* Information Letter #6; revised November 1964.
2. Donelan S. The wilderness instructor. Staging simulated accidents. *Wilderness Environ Med.* 2000;11:52–55.

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The Medical Wilderness Adventure Race (MedWAR): A 2-Year Perspective on a Unique Learning Experience

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Effective medical education requires a combination of didactic instruction and practical experience. Although most medicine can be taught in a clinic or hospital where patients are readily available, the challenge of providing a good, practical wilderness medicine experience is that both students and teachers must leave this traditional setting. Students must be provided with an opportunity to practice medicine. In many medical fields, instructors are able to perform their clinical duties while they are teaching. This model is more difficult to implement when teaching wilderness medicine. Didactic instruction may take place in the lecture hall, and even hands-on workshops can be given in the classroom, but the true practice of wilderness medicine does not happen until the classroom is hours away.

To remove the students and instructors from the classroom, we created an event called the Medical Wilderness Adventure Race (MedWAR). This event provided a way for medical providers to test their judgment when cold, tired, wet, and hungry. The MedWAR requires competitors to appropriately manage a number of medical scenarios placed throughout an adventure race. The events have included hiking, canoeing, a ropes portion, and orienteering. Events have lasted anywhere between 4 and 12 hours.

The mission statement of MedWAR includes the phrase ''To develop bonds of collegiality between participants from different schools, hospitals, professions, areas, and backgrounds.'' This event has indeed managed to attract participants from all levels of training and disciplines. The majority of participants have been medical students and residents, though other groups have been represented and competitive. Paramedics, college students, nurses, physician assistants, and army medical corps personnel have all raced. In the upcoming event this summer, a team of Eagle Scouts is planning to race.

The results of the initial race were reported at the WMS Conference in August 2001, Whistler Resort, British Columbia.

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MedWAR offers a way to test new skills, apply old skills in a new setting, and gain experience in the relatively safe situation of a supervised competition. At each event, we have given at least some instruction on navigation and water purification (Table 1), but our primary goal has been to present an opportunity for self-teaching. Before each event, participants were given a list of possible challenges (Table 2). From this list, they could plan ahead for various scenarios but did not know how many or to what degree they would encounter each scenario. Each problem had multiple solutions. Participants were encouraged to experiment and improvise.

The events of MedWAR have not been standardized, though each race has had common themes. Land navigation is a major part of the curriculum. Competitors are not placed on a race course but rather are given a series of checkpoints on a topographic map. The ability to find the way from one medical scenario to the next has proven to be one of the more difficult aspects of the race. In fact, getting lost during the event has been an almost universal experience. Competitors can expect to have to carry one of their teammates a significant distance, splint an upper and lower extremity, immobilize a cervical spine, treat anaphylaxis and cardiac arrest, and perform some sort of wilderness triage.

To give a specific example, at the Midwest MedWAR we included a canoe leg. Teams were given an envelope with the following instructions:

> *Proceed from Race Headquarters to the canoes on the beach. From there proceed to Point B on the Gregory Quadrangle Topo map and portage to Blind Lake. There will be a marker there with a pass phrase. Write down the phrase and follow the directions on the card.*

On arrival at Blind Lake, they found a placard that read

> *Pass phrase: ''We'd mount an expedition headed up into the bay, superstitious children playing pirates for the day''*
> *From here: Go to point A on the Gregory quadrangle*

Table 1. Medical Wilderness Adventure Race 2001 race-day schedule

Saturday, April 28	
8:00 AM	Certification Class Basic Wilderness Life Support (BWLS) Workshop Pavilion
1:00 PM	Workshop ''How Not to Get the Runs While You're Running—Water Purification'' Workshop Pavilion
1:30 PM	Workshop ''Land Navigation'' Workshop Pavilion
2:00 PM	VOLUNTEER MEETING Food Pavilion/Green Tent
3:00 PM	Team Captain's Meeting Workshop Pavilion
3:30 PM	(Approximate) Race Start
9:00 PM	(Approximate) Dinner Begins
11:00 PM	(Approximate) Awards Ceremony
??:?? PM	Last Team Finishes!
Sunday, April 29	
8:00 AM	(Approximate) Breakfast Begins
9:00 AM	Post-Race Discussions/Workshop
12:00 PM	Plan to Leave Wildwood—Have a Safe Trip!!!

Table 2. Curriculum

Musculoskeletal Injury Management
- Strains/Sprains
- Dislocations
- Fractures—Splinting, Traction

Soft Tissue Wound Management
- Lacerations
- Burns
- Puncture—with and without embedded objects
- Blisters
- Infection
- Frostbite—Extremity Immersion
- Animal Bites
- Insect Bites/Stings
- Fishhook Removal

Exposure Injury and Condition Management
- Hypothermia—Full-Body Immersion
- Hyperthermia/Heat Stroke
- Altitude/Mountain Sickness
- Dehydration
- Hazardous Materials Exposure
- Poisonings—Injections (Animals, Insects), Ingestions (Foods, Plants, Liquids)
- Contaminated Water/Water Purification
- Food/Electrolyte Deprivation
- Lightning and Other Weather Conditions
- Drowning/River Safety
- Fire Issues—Smoke Inhalation, Fire Safety

Systemic Injury and Condition Management
- Shock
- Respiratory Conditions/Respiratory Arrest (CPR)
- Cardiovascular Conditions/Cardiac Arrest (CPR)
- Neurological Injuries/Conditions
- Pre-existing Medical Conditions—Diabetes, Sickle Cell Anemia
- Diarrhea/Fluid Loss

General
- Ethical Issues in Wilderness Medicine
- Legal Issues in Wilderness Medicine
- Scene Assessment Skills—Multiple Patients (Wilderness Triage)
- Patient Assessment Skills—Multiple Injuries
- Pediatric Issues in Wilderness Medicine
- Orienteering
- Medical Kit Planning
- Expedition Gear Planning
- Communication Issues
- Transition-to-Hospital Issues

topo map. Show the above pass phrase to the chief of the station.

On arrival at the station, the team was handed an envelope that contained the following medical scenario:

Scenario:
You are just finishing a 2-day long trip in the Boundary Waters in Northern MN. While exiting the boat, team member C of your party fell in near freezing water hitting his/her head. He/She is now unconscious and completely soaked. It is 37°F and starting to drizzle. There is a shelter up the path with a radio.
Assess and manage your teammate's injuries.
Call a patient report to the local EMS. Be sure to include all pertinent information. Verbalize all of your actions.

There was a number of examiners that were given a list of critical actions. The teams were expected to meet all critical actions while transporting their team member approximately 100 m up the trail. On arrival, they were expected to give a succinct report in a simulated radio call. If they failed in any of the critical actions, they were sent another 200 m farther down the trail, where they found the following placard posted on a tree:

Penalty marker.
The critical actions for this station were:
- *Ensure an open airway. Reassess airway during pt. transport.*
- *Maintain cervical spine precautions during transport.*
- *Get pt. out of wet clothing into dry garments (maintaining C-spine).*
- *Be able to locate yourself on topo map and give a report to EMS.*
- *Start a fire.*

If you are at this marker you missed at least one of the above.
Take this phrase back to the station chief:
''I like mine with lettuce and tomato, Heinz 57 and French fried potatoes. Big kosher pickle and a cold root beer, well good gosh o' mighty which way do I steer?''

The required gear list (Table 3) for the teams included a change of clothing and material for starting a fire. Rather than simply state that they would change clothes and start a fire, competitors had to demonstrate these actions. Because the actual temperature on race day was near 50°F, we did not actually require the competitors to submerse themselves. Had the temperature been 65°F or warmer, team member C would have been placed in the water at the start of the scenario.

The competitors are numbered by teams, and each team member is given a letter. These designations are important, because at some point in the race each competitor will have to play an injured member. During one of the scenarios in the Michigan event, we ''killed-off'' the team captains. This was done to test the ability of the team to continue to function without the person most likely to provide leadership. In some instances, mannequins have been used to simulate accident victims, and in other instances we have used pictures. Competitors have had to treat wounds and remove fishhooks from chicken legs or pigs feet.

Table 3. Equipment list

Required individual gear (must be carried the whole race)
Light source and extra batteries
Waterproofed change of clothes
Outer waterproof shell
Hat
Gloves
Dry socks
Required team gear
Compass
Whistle
Method to start a fire
Method to purify water
Patient transport system
Adequate food for 8 hours of physical activity

The level of expected care is what one would anticipate from a qualified provider on a commercial expedition. Competitors are encouraged to prepare before the event and to carry a reference during it. We use the *Field Guide to Wilderness Medicine* by Auerbach, Donner, and Weiss as the source from which we choose our critical actions for the scenarios. The challenges are primarily practical. A competitor should be able to describe the reduction of a deformed extremity and demonstrate how to splint it. The written exam could be successfully answered using the field guide as well. This means that asking for specific antibiotics for diarrhea, animal bites, or Lyme disease is appropriate.

The volunteers have varied levels of experience, but a physician or paramedic with significant wilderness experience will be in charge at each main station. Volunteers at a simple challenge may have little medical experience. Usually they are first- or second-year medical students. The simple challenges are present at road crossings or used to break up the longer intervals between medical scenarios. In these instances, the primary function is to keep track of the teams, which are required to perform a single critical action. An example of this is to give a description of a patient demonstrating classic signs of anaphylaxis after a bee sting. Teams that thought ahead to bring an Epi-pen or a syringe labeled ''epinephrine'' will move on with-

out any time penalties. The longer scenarios, such as the above example of a teammate who fell into the water, will be judged by someone who has much more patient care experience. In these cases, the examiner must exercise some judgment as to how appropriately the airway was secured or how well the neurovascular status was assessed. The station chiefs may be assisted by a volunteer with specialized knowledge outside of medicine. For instance, each race has had a ropes portion, and a local expert has always been present to check harnesses and belays.

Perhaps one of the more debated aspects of the race has been the written exam. Each race so far has had one. In the most recent event, competitors had to wade through a waist-deep swamp to find the questions. The intent has been to test all items in the curriculum, for creating a practical challenge for something like altitude illness or snow blindness would be difficult. It is a minimally labor-intensive way to present the learners with a broad series of questions. It allows us to cover a greater area of the curriculum and to test material that is not easily simulated. However, in an event that purports to test practical skills, giving the competitors a written exam seems to be counter to the overall experience.

The competition is essential to the instruction. Adding the stress of a race makes the competitors feel the urgency of a medical emergency: they tend to make mistakes that would not occur in a simple workshop, and they are provided with a very hard method of comparison. The most obvious evaluation of the students comes from their place finish in the race. Teams are assessed penalty tasks for improper responses at the medical scenarios, and they are given time penalties or additional challenges for poor test performance. The ability to navigate properly has always played a role in the finishing order. Over the past 3 years, teams of Emergency Medicine residents have dominated the podium more for their ability to work together as a team than for their speed of travel.

The evaluations we have received from competitors suggest that the greatest value of the event is the camaraderie that it engenders and the confidence the competitors gain. The majority of competitors ''strongly agreed'' that they gained valuable experience through their participation. A large number also felt they had gained new skills and new knowledge, though not to the extent that they had gained experience. Most of the complaints about the events have centered on the written test. The degree of difficulty of the physical and medical challenges has been commented on almost equally as being too easy or too difficult at each specific event. The Michigan event, which was held in late October and lasted 8 to 10 hours for the majority of the teams, was generally felt to be longer than ideal with the medical challenges too spread out.

So far, we have organized 4 races, 3 in Augusta, GA, sponsored by the Medical College of Georgia and 1 in Pinckney, MI, sponsored by St Vincent Mercy Medical Center's Emergency Medicine residency in Toledo, OH. Participation has grown in each race from 90 competitors in the first to 140 in the most recent. The Georgia and Michigan events are now annual, and a group in Tennessee is trying to initiate another event.

Our future direction includes creating the North American Educational Adventure Racing association (NAEAR). The purpose of this organization is to promote these events while maintaining a high-quality educational experience. NAEAR will help coordinate event schedules and test questions to prevent conflicts and duplication. It will also provide an ''expert'' panel available to new race directors, maintain a Website and mailing list, assist in assigning continuing medical education credits, and create liaisons with the Wilderness Medical Society and other adventure racing organizations.

References

1. Auerbach PS, Donner HJ, Weiss EA. *Field Guide to Wilderness Medicine.* St Louis, MO: Mosby; 1999.