

## Introduction to Wilderness Emergency Medical Service

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### Abstract

There is neither wilderness emergency medical technicians (WEMT) organization nor related training course in Taiwan. When casualty incidents or disasters occur, there is no WEMT first responder in Taiwan, either. We always use instead search and rescue teams that have no special training for wilderness medicine. The “chain of survival” early access, early cardiopulmonary resuscitation, early defibrillation and early advanced cardiac life support may be not available in wilderness event. To lower prehospital resuscitative rate, we must establish a well-organized wilderness emergency medical service by developing its training course, prehospital care and certification system in Taiwan. (*Ann Disaster Med.* 2004;3 Suppl 1:S35-S39)

**Key words:** Wilderness EMT; Wilderness Medicine; Training; Disaster

### Introduction

Wilderness medicine is the term commonly used in extending the topics commonly taught in first aid, first responder, and emergency medical technician programs.<sup>1-18</sup> Wilderness medicine usually presumes that the ambulance or air ambulance is hours to days from arriving in the context of emergencies. The usual scenarios may be that the injury occurs on a backcountry trail, someone may well have to walk out to summon help, or the patient may have to be laboriously carried out.

Wilderness medicine also includes injury from extreme environment such as cold, heat,<sup>3,4</sup> or high altitude;<sup>5-18</sup> the effects of toxic plants and animals, and the types of injuries that may be experienced from the stresses of outdoor

living.

The so-called “Wilderness Emergency Medical Technician (WEMT)” training should include the standard EMT material plus wilderness search and rescue in the environment.<sup>19</sup> There are currently no standard training program for WEMT as yet, except a few sporadic courses developed by some organizations in Taiwan. Although there are some common lessons, the section of “wilderness medicine” are still developed solely by the individual organizations and country. So it is urgent for us to design the protocol of wilderness medicine including the basics of rescue, long-term care techniques and transport in backcountry settings.

### Roles of Wilderness Emergency

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## Medical Technicians

The WEMT's roles include educating other search and rescue team members in wilderness prehospital care, providing medical support during a search, serving in the medical position on a search team to care for wilderness patient during a rescue.

The WEMTs provide care for the patient carrying only simple medical kit initially, and always need additional materials if continued medical care to victim during the evacuation is indicated. During the evacuation, the WEMT acts as both a nurse and a physician's assistant and do best as they can. The WEMTs usually accompany the patient to the hospital, along with the local prehospital personnel if needed or may simply transfer care to transporting personnel.

## Characteristics of Wilderness EMTs

Wilderness EMTs need special training for the wilderness environment and for search and rescue, as described above. The EMT safety depends on his or her ability to coexist safely with wilderness in a search and rescue situation.

The WEMT must carry out emergency medical tasks despite severe environmental stress (for example, freezing rain, blizzards, 41c heat). Wilderness emergency medical equipment is limited by what the team members can carry on their back or improvise. When a search and rescue team is out for one day or more and when the team is out of contact with a command physician, the WEMT is the sole rescue team's medical expert.

## Prerequisites of WEMT

In U.S., the EMT or paramedics (or equivalent certification) is a prerequisite for WEMT. In

U.S., the WEMT members has search and rescue experience prior to a student enrolling in a Wilderness Emergency Service Institute WEMT course.

Wilderness EMT is toughly a team effort that compare to street EMT. The wilderness basic EMT will often to assist their WEMT-Paramedics team members with advanced skill (e.g. helping prepare IV bags and lines under the WEMT-P's supervision). In U.S Wilderness EMS Institute, a common course curriculum would be used for the EMT and paramedic, although there is additional training in wilderness for WEMT.

## Curriculum of the WEMT

### *Patient assessment*

To effectively manage the victim of illness or injury, the WEMT must first determine the scope and nature of the problem. WEMTs must contend with the additional pressures of a potentially hostile environment, limited resources and personnel and limited training. The WEMTs face rescues taking hours or even days and will have to manage chronic and acute problems and will have ample time to suffer the consequences of any injury or illness missed during the history and physical. WEMTs must therefore learn the general principles of taking a history and performing a physical exam and get from a brief primary and secondary survey.

### *Scene management, communications, reporting, documentation*

The WEMTs have the training in scene management do much better on both indoor and field exercises because of the management of scene for the purpose of insuring safety of the rescuers and patient must be stressed.

Communication, reporting, and documentation are even more important to a WEMT than to a 'street' EMT. When medical command and search and rescue team communications are spread out over many hours, small mistakes can mean big problems. The picture the WEMT paints to the Wilderness Command Physician must be accurate if the WEMT expects good command and good medical advice.

### **Wilderness surgical problem**

The treatment of many surgical conditions involve the use of over-the-counter or prescription medications or minor surgical procedures. The choice of wilderness medical kit drugs and surgical procedures is up to the WEMTs medical director and appropriate local laws and regulations.

### **Wilderness medical problems**

There are three criteria include in the wilderness medical problems; (a) it is common in the wilderness and can be treated by the WEMT (b) the problem cannot treat by WEMT and may make significant intervention by notifying Incident Staff and abortion the task or starting an immediate evacuation (c) the management of the problem in the wilderness differs from that taught to street EMT.

The WEMTs are the team medical expert and must understand proper use of the medications, including their interactions and any problems that might be expected from their using.

### **Wilderness trauma**

The Wilderness Trauma include the epidemiology, etiology, mechanism of injury for the wilderness trauma and discusses the gen-

eral approach to the wilderness trauma patient and which is very different from urban and rural trauma and provide the patient assessment with physical exam in detail that are important for wilderness trauma patient.

The WEMTs must be faced the complications of trauma such as renal failure, crush injuries, myoglobinuria, hyperkalemia, ileus, glycogen depletion, compartment syndrome, ARDS, fluid overload that occur while the patient is caring on evacuation from wilderness.

### **Pharmacology**

This section provides the WEMT with an overview of pharmacology oriented to common oral prescription and over-the-counter medications. The WEMT will need to deal with team members' medical problems and it's better for knowing about more medication information and WEMT educated to care for their own minor medical problems is an added benefit and they will encounter the wilderness patient and take care patient for hours or days.

### **Immobilization, packaging, transportation**

It provides the effects on the patient of various types of packaging and splinting over the course of a wilderness rescue. The series of packaging problems guides the student through the thought process for selecting packaging and transportation methods and it doesn't explain how to perform various sorts of wilderness rescue and leave for search and rescue training.

### **Disasters**

The wilderness EMTs are ideally trained for service in a catastrophic disaster. All of these lack of food, lack of water, lack of shelter, lack

of transportation are everyday occurrences for the Wilderness EMT. Surviving in a hostile environment and attending to the medical needs of a rescue team when remote from a hospital and that are all part of the WEMT's job. When a catastrophic disaster occurs that the local WEMTs are an ideal resource to immediately drop into the disaster site. So, Wilderness EMT is already suited for first-in emergency care during a catastrophic disaster. But, the purpose of this curriculum was not to make "Wilderness EMT" into a "Disaster EMT".

### Can WEMT Training be Used for Disaster Teams?

A catastrophic disaster that extends the local resources and is similar to a wilderness search and rescue. At this scene, there is no shelter, exposure to environmental heat, cold, snow, rain and the local hospital may be destroyed for days and EMT may care the patient for day or more by themselves.

In short, the WEMSI suggest that the wilderness EMT training is ideal for members of disaster response teams.

### Conclusion

In Taiwan, there is neither WEMT organization nor WEMT training course. When single casualty incident or multi-casualty incident or disaster (flood, earthquake) occur, there will be no first responder of WEMT in Taiwan. We always use search and rescue teams instead even they have no training for long time care of victim under the hostile environment.

The "chain of survival" early access, early cardiopulmonary resuscitation, early defibrillation and early advanced cardiac life support is not being in wilderness event. In order to lower

the resuscitative rate during prehospital phase, we must establish a well organized WEMS and training course, prehospital care and certification system in Taiwan.

### References

1. Goodwin RA, Des Prez SR. State of the art: Histoplasmosis. *Am Rev Respir Dis* 1978;117:929-56
2. Lewis WC. Histoplasmosis: A hazard to new tropical cavers. *NSS Bulletin (National Speleological Society)* 1989;51:52-65
3. Hackett PH, Roach RC, Sutton JR. High altitude medicine. Management of wilderness and environmental emergencies. Ed Auerbach PS Geehr EC. 2nd ed. St. Louis: C.V. Mosby Co., 1989:1-34
4. Reifsnnyder WE. Weathering the wilderness: The Sierra Club guide to practical meteorology. San Francisco: Sierra Club, 1980.
5. Peters E, ed. *Mountaineering: The freedom of the hills*. Fourth Edition. Seattle: The Mountaineers, 1982.
6. Roberts JR. Exposure to the sun. Management of wilderness and environmental emergencies. Ed. Auerbach PS Geehr EC. 2nd ed. St. Louis: C.V. Mosby Co., 1989: 195-222
7. Kaplan LA. Suntan, sun burn, and sun protection. *J Wild Med* 1992;3:173-96
8. Tek D. Effect of cold on drugs. *Wild Med Ltr* 1991;8:8-9
9. Auerbach PS, Miller EY. High altitude flatus expulsion (HAFE) [letter]. *West J Med* 1981;134:173
10. Hultgren HN. High altitude medical problems (CTM:IX). *Scientific American Medicine*. Ed. Rubenstein E Federman

- DD. 1991
11. Schoene RB. Pulmonary edema at high altitude: Review, pathophysiology, and update. *Clinics in Chest Medicine* 1985;6: 491- 506
  12. Honigman B. Acute mountain sickness at moderate altitudes. *Syllabus: Eighth annual scientific meeting of the Wilderness Medical Society* 1992:127-40. Indianapolis, IN: Wilderness Medical Society
  13. Hackett PH, Rennie D, Levine HD. The incidence importance and prophylaxis of acute mountain sickness. *Lancet* 1976;2: 1149-55
  14. Hackett PH, Rennie D. Acute mountain sickness [letter]. *Lancet* 1977;1:491-2
  15. Hackett PH, Rennie D. Avoiding mountain sickness [letter]. *Lancet* 1978;2:938
  16. Cymerman A, Jaeger JJ, Ko brick JL, Maher JT. Physical fitness and acute mountain sickness (AMS). *Proceedings of the First International Hypoxia Symposium* 1979. Alberta, Canada.
  17. Gupta JS, Joseph NT, Malhotra MS. Physical fitness status and adaptation to high altitude. *Indian J Med Res* 1978;68:312-21
  18. Consolazio CF, Johnson HL, Krzywicki HJ. Body fluids, body composition, and metabolic aspects of high-altitude adaptation. *Physiological adaptations: Deserts and mountains*. Ed. Consolazio CF, Johnson HL, Krzywicki HJ. NY: Academic, 1972:227- 41
  19. Johnson DE. Wilderness emergency medical services. *Emerg Med Clin N Am* 2004; 22:525-38