

The WEMSI WEMT curriculum is competency-based rather than hours-based, but can be completed in roughly five intensive days. There is plenty of practical time, including a long outdoor exercise. Here are the twenty sections of the Curriculum:

Introduction to WEMS, the WEMT, and the WEMSI Curriculum

The first section gives historical background to make sense out of the ideas of “Wilderness EMT” and “Wilderness Command Physician.” It also reviews those medico-legal principles that are of particular interest to the **wilderness** EMT. We review the various roles of the WEMT. This includes not only care of rescued patients, but incidental care of SAR team members when in the wilderness, and wilderness medicine education for team members and others.

The Wilderness Environment: Hazards, Safety, and Patient Care Implications

The second section looks at the wilderness environment and its interaction with the patient and with the wilderness EMT. We review the dangers of the wilderness environment for both rescuer and rescuee. Protection against sunburn, protection against blood-sucking arthropods, and removal of ticks are important points discussed.

Patient Assessment

The third section goes beyond EMT training to teach the rudiments of a full “H and P,” which is appropriate for many wilderness patients. We review the principles of the primary survey as adapted to the hazards of the wilderness environment. We expand the “secondary survey” to include a neurological exam. We discuss in detail the single vital sign most neglected on the street and most important in the wilderness: temperature.

Scene Management, Communications, Reporting, and Documentation

The fourth section deals with the mechanics that surround and permeate actual wilderness medical care: scene management, communications, reporting, and interaction with an on-line Wilderness Command Physician.

Wilderness Surgical Problems

This section discusses which dislocations to reduce in the wilderness and why, when to suspect a subcapsular hemorrhage of the spleen, how to manage wounds including open fractures, how to drain a subungual hematoma, how to deal with a team member who hurt his back lifting the litter, and how to “clear the C-spine” in the field when necessary.

Thermal Regulation Heat-Related Disorders Burns and Lightning Cold-Related Disorders

Thermal Regulation, Heat-Related Disorders, and Cold-Related Disorders go into detail on these important topics. Care of frostbite and hypothermia is controversial even in the hospital. Therefore, we’ve gone to great lengths to research these controversies, even searching out unpublished research when we needed it to clarify an important point. We think we’ve given the best possible recommendations on treating these cold-related injuries, and back it up with 200 specific references. For instance, we recommend the use of prophylactic bretylium but **not** lidocaine for hypothermic patients. We also recommend the use of low-molecular-weight dextran for frostbite and hypothermia for long evacuations. Even if later research gives us new insights, the information should provide a good background to build on. Burns and Lightning expands on the EMT’s basic training in these areas. It emphasizes problems that are seldom relevant to the “street” EMT, such as how to prevent myoglobinuria from causing acute renal failure.

Altitude Illness

Section Ten, on altitude, gives the latest developments on acute mountain sickness, high altitude cerebral edema, and high altitude pulmonary edema. There is not much controversy here, but the information may be new to many prehospital providers.

Bites and Stings

Section Eleven discusses the proper field treatment of spider bites, bee and wasp stings, and snakebite. Since snakebite first aid is so controversial, the discussion is lengthy, and is very well referenced. This section has been

reviewed by experts in the field, such as Michael Callahan, Findlay Russell, and John Sullivan.

Wilderness Medical Problems

In the *Wilderness Medical Problems* section, we present a précis of the accepted treatment of many common medical problems. This material is not routinely covered in EMT and paramedic classes. However, it’s all common knowledge to medical practitioners; you’ll find little controversial material in this section. We cover diseases such as rabies, hepatitis, and tetanus. We explain how to deal with common eye problems such as a corneal abrasion, snowblindness, conjunctivitis, and subconjunctival hemorrhage. Colds, ear and sinus infections, cystitis, and dental problems all occur in the backcountry; they are often treated with medications from a SAR team members’ own medical kit. We discuss the proper management of each of these with common over-the-counter or prescription medications from personal wilderness medical kits. We describe how to apply the techniques of Basic Cardiac Life Support when far from a road, and cite the medical literature to back our recommendations.

Wilderness Trauma

Wilderness Trauma stresses the differences between “street” and wilderness trauma management. In this section, we cover the epidemiology, etiology, and mechanism of injury for wilderness trauma (or at least the little that we know). We review *Accidents in North American Mountaineering, American Caving Accidents*, search and rescue team data, and the few published studies of wilderness trauma. We also discuss the general approach to the **wilderness** trauma patient, which is very different from urban and rural trauma. The Advanced Trauma Life Support, Pre-Hospital Trauma Life Support, and Basic Trauma Life Support courses are designed for the critically injured patient who must have immediate surgical intervention to survive. In the wilderness, transport is by definition delayed and such injury is not survivable. Unfortunately, standard ATLS, PHTLS, and BTLS training is of very little use to the wilderness rescuer. Therefore, the Wilderness EMT must **not** “scoop and run,” but must take the time to examine or problems that might become life-threatening during a long evacuation.

We include optional sections on the mechanism of injury for wilderness trauma, extending the type of analysis provided in BTLS/PHTLS and some EMT/paramedic courses. There are also optional sections on the physiology of trauma, shock, and blood pressure. Though the section on *Patient Assessment* reviews the physical exam in detail, here we reemphasize specifics that are important in the trauma patient.

Unlike on the street, interventions such as intravenous fluid may be lifesaving for wilderness trauma patients. We stress fluid management; though basic EMTs can’t start IVs, they may need care for the patient after the EMT-P is gone or incapacitated. Or, basic EMTs may need to choose the fluids to carry into the site for an EMT-P who is already there. (This is especially true in cave rescue.)

Perhaps most importantly, we present complications of trauma that are likely to occur while the Wilderness EMT is caring for the patient. Complications such as renal failure, crush injuries, myoglobinuria, hyperkalemia, ileus, glycogen depletion, compartment syndrome, ARDS, and fluid overload are reviewed. Some of these complications can be treated by a Wilderness EMT, others can be recognized and evacuation plans changed: for example, a surgeon can come into a cave to perform a fasciotomy during a lengthy evacuation.

Pharmacology

Section Fourteen, *Pharmacology*, provides the Wilderness EMT (EMT-Basic, EMT-Paramedic, or in between) with an overview of pharmacology oriented to common oral prescription and over-the-counter medications. This causes some to object: they find it immoral to teach pharmacology to EMT-Basics, who cannot administer medications to others. We disagree. Most of those in the outdoors for recreation take a medical kit with them. This includes members of wilderness search and rescue teams. And, since WEMTs will need to deal with team members’ medical problems, the more they know about the medications members are taking, the better. (Having WEMTs educated to care for their own minor medical problems is an added benefit.) Some wilderness search and rescue teams’ medical directors provide members with prescriptions for a personal wilderness medical kit similar to that

described in this section. And in some wilderness EMS systems, WEMT-Basics may give oral medications.

And, the naysayers go on, EMT-Ps already know all about pharmacology. But what we are teaching is, for the most part, as new to EMT-Ps as to EMT-Basics. (A quick comparison of this with the pharmacology section of the EMT-P curriculum should confirm this.)

Let it not seem that we are training EMTs to go out to play doctor indiscriminately. We train WEMTs about medications they will encounter in wilderness patients, and to use over-the-counter medications to care for themselves **only** while in the wilderness. We firmly favor each WEMT having a family doctor for routine medical problems.

Immobilization, Packaging, and Transportation of Wilderness Patients

Packaging and Transport reviews the basics of patient packaging as presented in search and rescue courses. It then goes on to assess effects on the patient of various types of packaging and splinting over the course of a wilderness rescue. (How long **can** a person stay on an unpadding backboard before (1) developing pressure necrosis, or (2) attempting to get out of the packaging and kill the rescue team?) We present improvised splinting and evacuation methods, and evaluate their safety and effectiveness. A series of packaging problems guides the reader through the kind of thought process that WEMTs must go through when selecting packaging and transportation methods. This section does not explain wilderness rescue; we leave that to wilderness rescue texts.

Disasters

Section Sixteen is about disaster operations. Wilderness EMTs are ideally trained for a catastrophic disaster. Lack of food, lack of water, lack of shelter, lack of transportation: these are everyday occurrences for the Wilderness EMT. Dealing with traumatic and environmental injuries, with patients with acute stress reactions, with patients over an extended period, with patients with improvised equipment: this too is the province of the WEMT. Surviving in a hostile environment and attending to the medical needs of a rescue team when remote from a hospital: all part of the WEMT's job. So, you see, a Wilderness EMT is already suited for first-in emergency care during a

catastrophic disaster. Our purpose in crafting this Curriculum is not to make it into a "Disaster EMT" course. But, we recognize that, when a catastrophic disaster occurs, someone may notice that the local WEMTs are an ideal resource to immediately drop into the disaster site. Therefore, we want to prepare Wilderness EMTs for the hazards and special considerations of such a situation. We can envision this WEMT course being used to train Disaster EMTs. For such a class, we would expect to have another add-on module with more in-depth coverage than provided in this section. This section starts by defining: multi-casualty incident, single-casualty/multiple resource incident, and catastrophic disaster. It then compares and contrasts these different types of incident, focusing on the "true" catastrophic disaster, and reviews the principles of triage with specific modifications for wilderness disasters. The section then discusses political, logistical, public health, and medical aspects of disasters. Then, we cover medical and surgical problems that are likely to be associated with different types of catastrophic disasters, and how to apply Wilderness EMT training to each.

Orientation to/Review of Advanced Medical Skills

The section on *Advanced Skills* has different goals for EMTs and for paramedics. For EMTs, it teaches how to assist paramedics performing Advanced Life Support type skills, and how to manage the patient when the paramedic is no longer there. (E.g., how to pull back an endotracheal tube that has slipped into the right mainstem bronchus, and how to check an IV.) For the paramedics, the section teaches how to perform skills in the wilderness.

Principles of General Medicine

Pinciples of *General Medicine* is section Eighteen. Part of the problem of training WEMTs is that we must train the WEMT to deal with situations that we have not imagined; often these situations occur when they have no communication with a medical command physician. Therefore, we have chosen to teach the WEMT the most basic principles of medicine and nursing in this section. The psychological sections of the section are of benefit in all patient care. The principles of infectious diseases, wound care, and convalescence are of less direct applicability for the WEMT, but are important parts of basic medical knowledge. Nonetheless, we felt the book incomplete

without this basic information. We discuss the types of microbes that cause disease, relating them to diseases already discussed in other sections. We review germ theory and the principles of asepsis. We review medical countermeasures for infectious disease, including immunizations and antimicrobials. We pay careful attention to wound infections and their prevention. A section discusses nutrition, convalescence, and recuperation, including the problems of pressure necrosis and the need for good pulmonary toilet. A section reviews how to control pain without medications, including the use of suggestion and imagery. A discussion of the psychology of wilderness patients brings the section to a close.

Stress Management and Critical Incident Stress Debriefing

The section on *Stress Management and Critical Incident Stress Debriefing* is, we think, unique. It reflects the growing understanding of the effects of stress on SAR team members and Wilderness EMTs, and shows how to minimize these effects. Though it draws on the expertise of Task Group member Dr. Jeff Mitchell, the "father" of Critical Incident Stress Debriefing in the U. S., it is leavened with the experience of those with years of wilderness search and rescue experience. The result is tailor-made to fit the needs of wilderness rescuers.

Emergency Veterinary Medicine for Dogs and Horses

Section twenty applies the WEMT's medical knowledge to the care of dogs and horses. (Dogs and horses feature prominently in SAR missions, and WEMTs will be expected to help care for them when injured or ill.)

We also provide an outline of recommended clinical training in the Emergency Department.

The following additional free brochures are available from the Center for Emergency Medicine of Western Pennsylvania, 230 McKee Place, Suite 500, Pittsburgh, PA 15213-4904, 412-578-3203, wemsi+@pitt.edu:

- ❑ a current schedule of WEMSI-Recognized classes
- ❑ "The Wilderness EMS Institute"
- ❑ "Wilderness EMT Documents" (order form)
- ❑ "Wilderness EMT and Wilderness Command Physician Classes"

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Wilderness EMT Curriculum

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