

Mercy Hospital of Pittsburgh
Department of Emergency Medicine
Wilderness Emergency Medical Services Rotation
for R-2 and R-3 Emergency Medicine Residents
in coordination with:
Center for Emergency Medicine of Western Pennsylvania
Wilderness EMS Institute
Allegheny Mountain Rescue Group, Appalachian Search and Rescue Conference, and
Eastern Region, National Cave Rescue Commission
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Narrative Summary

The primary purpose of this rotation is to prepare the resident to assume a medical leadership role with a Wilderness EMS Agency. Such WEMS Agencies include, but are not limited to, search and rescue teams, ambulance companies and rescue squads with wilderness or backcountry in their coverage areas, and governmental agencies such as state and federal park services.

Although the rotation provides some opportunities for field training, the rotation does not purport to prepare the resident to respond into the wilderness. The rotation does not provide training in how to be an expedition doctor, or other non-EMS aspects of wilderness medicine. It focuses very closely on working with prehospital providers in the wilderness and backcountry setting.

The exact activities of the month will vary based on the SAR training available during the month. However, every rotation will feature attendance at a 60-hour WEMSI Wilderness EMT course, with the resident auditing lectures and instructing in practical sessions.

Prerequisites

- Second or Third Year Emergency Medicine Resident
- Some Outdoor Experience and Outdoor Equipment (see Appendix)
- Sleeping Bag and Foam Pad for Wilderness EMT Class Weekends
- Vehicle Capable of Responding to Search and Rescue Operations

Goals

- Be able to assume medical direction of a Wilderness EMS Agency.
- Understand the character and scope of the medical discipline of Wilderness EMS.
- Understand basic short-term wilderness survival principles, basic wilderness safety and principles of personal equipment selection for the wilderness.
- Understand the basics of wilderness search and rescue (SAR).
- Understand the current status of wilderness prehospital training.
- Understand important factors in the training and medical direction of prehospital personnel in wilderness and backcountry EMS.

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- Identify important issues in medical oversight of Wilderness EMTs and other wilderness prehospital providers, including both direct and indirect medical control.
- Learn details of prehospital care management specific to the wilderness, backcountry, and delayed/prolonged transport settings.
- Learn detailed information about specific Wilderness EMS related medical problems (e.g., hypothermia, heatstroke, bites and stings) as dictated by the needs of the month's teaching schedule.
- Learn how to use the Grateful Med program to set up "renewable" searches for topics related to Wilderness EMS and to use Grateful Med searches to update Wilderness EMS Protocols and Standing Orders.

Methods

Methods will vary based on Search And Rescue and Wilderness EMS activities available during the month, but the following will always form part of the month:

- Guided reading of textbooks and journals from the Mercy Hospital and Emergency Medicine Association of libraries, and from personal collections of Department of Emergency Medicine physicians.
- Required reading: chapters on Wilderness EMS from Stewart's *Environmental Emergencies* and NAEMSP *Medical Director's Handbook*, 2E; SARTA *Ground SAR Manual*; preliminary version of *Emergency Care in the Wilds* from Wilderness EMS Institute; current drafts of ASTM *Wilderness First Responder* and *Wilderness EMT* standards.
- Searching the MedLine database using the Grateful Med program.
- Teaching prehospital personnel, and medical students and interns rotating in the Department of Emergency Medicine, about topics related to Wilderness EMS.
- One-on-one discussions with members of the Mercy medical staff (may include Emergency Medicine, OB/GYN, Internal Medicine) about Wilderness EMS and related topics.
- On-on-one discussions with members of local wilderness search and rescue teams about Wilderness EMS and related topics.
- Group discussions with members of wilderness SAR teams.
- Participation in search and rescue training with members of local SAR teams.

Evaluation

- Subjective evaluation by the rotation Preceptor, provided to the resident's Residency Director in letter form.
- The Wilderness EMT/Wilderness Command Physician written exam given by the Wilderness EMS Institute.

Certification

Residents who complete all requirements for Wilderness EMS Institute certification as a Wilderness Command Physician shall receive such certification.

Educational Objectives

- Define "wilderness," "wilderness EMT," "Wilderness Command Physician," and "wilderness EMS."
- Describe the medical discipline of Wilderness EMS; in particular, describe how traditional Wilderness Medicine and Emergency Medical Services must be adapted for the wilderness EMS environment.
- Describe how the medical discipline of Wilderness EMS correlates with the medical specialty of Emergency Medicine, and the medical disciplines of Emergency Medical Services and Wilderness Medicine.
- Describe the roles of the following organizations in wilderness EMS:
 - Wilderness EMS Institute/Wilderness Emergency Medicine Curriculum Development Project
 - Wilderness Medical Society
 - National Association of EMS Physicians
 - Appalachian Search and Rescue Conference
 - National Cave Rescue Commission
 - Center for Emergency Medicine of Western Pennsylvania
 - National Association for Search and Rescue
 - Stonehearth Open Learning Opportunities
 - Wilderness Medicine Institute
 - Wilderness Professional Training
 - Wilderness Medical Associates
 - ASTM F-30 and F-32
 - National Ski Patrol
- Outline principles of wilderness survival, including:
 - define short-term versus long-term survival;
 - describe several problems commonly encountered on SAR missions that may lead to a survival situation;
 - describe the psychological factors that may affect survival ability;
 - explain the "energy reserve" concept; and
 - describe the body's physiologic response to both cold and heat stress.
- Explain these principles of clothing selection:

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- Choice of clothing material, listing the "3 W's" of clothing for wet, cool climates, and explaining their importance;
 - Waterproof and windproof clothing, including the advantages, disadvantages, and uses of waterproof shell garments, and the water penetration resistance of: coated nylon; 60/40 cloth; 65/35 cloth; and waterproof/ breathable fabrics;
 - Layering and other cold weather dressing concepts, including: ventilation, "dressing cold," and the dangers associated with overheating in the winter; and
 - Loft and other properties of clothing suitable for various weathers, including a description of clothing materials, including cotton, down, wool, and synthetic fibers, in terms of dry warmth, wet warmth, wind protection, absorption and retention of water, and wicking of water.
- Describe several ways to prevent excessive body heat loss. Describe the following concepts and their importance to maintaining body temperature.
 - The routes of heat loss and their relative importance;
 - the use of energy stores to produce heat, and the metabolic costs of shivering;
 - vasodilation, sweating, and behavior means of increasing heat loss, and the long term consequences of them;
 - vasoconstriction and behavior as a means of conserving heat;
 - the effects of tobacco and alcohol on normal heat homeostasis; and
 - the particular danger of "hypothermia weather."
 - Explain the selection principles for the following personal equipment used in wilderness EMS:
 - boots;
 - sleeping bag;
 - ground protection and insulation;
 - backpack/daypack;
 - tent;
 - personal safety items;
 - fire starting aids;
 - items for signalling and navigation;
 - light sources and batteries;
 - emergency shelters; and
 - stoves.
 - Describe the basic characteristics (voltage, life, weight, cost, temperature characteristics and dangers) of carbon-zinc, alkaline, lithium, and nickel-cadmium electrical storage batteries.

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- Outline the discipline of wilderness search and rescue, including:
 - Describe areas of responsibility for search and rescue as defined by the National SAR Plan.
 - Describe areas of responsibility at the state level.
 - List several resources that might be used during a SAR event.
 - List several factors that may result in an aircraft being listed as missing.
 - Describe the basic principles of the national Incident Command System and define the major staff positions as used in SAR.
 - Describe the circumstances when entry upon private property may be justified; define the problems involved with this action and possible solutions.
 - Briefly explain how the following legal concepts apply to search and rescue operations:
 - civil suits and criminal actions;
 - standards of care;
 - the right to emergency assistance and duties to provide emergency assistance;
 - crime scene protection;
 - declaration of death and confirmation of death; and
 - confidentiality.
- Describe the principles of wilderness search, including the following:
 - Identify the most basic tenet of search and rescue, the one that should govern all SAR activity.
 - Identify the primary goal of all SAR activity.
 - Identify and define four key points of search theory.
 - Describe the standard techniques for these search tactics:
 - attraction;
 - containment;
 - survey search;
 - hasty search (scratch search);
 - sweep search (open grid search);
 - line search (closed grid search); and
 - route search.
 - Describe standard procedures for working with search dogs, tracking/trailing

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dogs and mantrackers.

- Define the four core elements of tactical search operations.
- Briefly describe the five phases of a search event.
- Describe the current state of Wilderness EMS training in the United States and Canada, including Wilderness EMT, Wilderness First Responder, and Wilderness Command Physician training.
- Become familiar with the structure of Wilderness EMT training using the ASRC-CEM Wilderness EMT Curriculum, including:
 - prerequisites;
 - clinical training; and
 - the applicability of the curriculum to EMT-Basics, to EMT-Paramedics, and to other advanced EMTs.
- Define certification and licensure, compare and contrast them, and apply them to the Wilderness Emergency Medical Technician.
- List the components of an EMS system, and describe how these should be implemented in a Wilderness EMS system.
- Describe the role of WEMTs and Wilderness Command Physicians:
 - when not involved in an operation;
 - when on a wilderness search and rescue, operation, either at base, on a search team, or on a rescue; and
 - during a catastrophic disaster.
- Describe important EMS medico-legal issues that are relevant to WEMTs and Wilderness Command Physicians:
 - law suits: negligence and tort claims;
 - standard of care;
 - duty to act;
 - abandonment;
 - medical practice acts;
 - delegated practice;
 - on-line command;
 - off-line command;
 - protocols and standing orders;
 - doctor-patient relationships versus EMS medical command; and
 - dealing with a dead patient, including: determining death, declaring death, and certifying death ("signing the death certificate").

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- Identify important guiding principles for the WEMT, including:
 - keeping up certification and competence via continuing education in three areas: search and rescue, "street" EMT skills and knowledge, and Wilderness EMT specific skills and knowledge;
 - recognizing the psychological stress of wilderness and taking appropriate countermeasures as needed; and
 - meticulously documenting all care given.
- Describe important concepts in the initial management of a patient who has been lost, including possible dehydration, hyponatremia, hypothermia, starvation, and disorientation.
- Describe important concepts in the initial management of patients who are being rescued, including:
 - removing patients from water immersion, including: hydrostatic "squeeze," and possible ill effects of patient self-assisting in rescue efforts;
 - removing entrapped patients from entrapment, including "third-space" losses, hyperkalemia, and crush syndrome; and
 - moving and realigning patients into a standard anatomic position for further immobilization and packaging.
- Describe the components and important concepts embodied in the FAST and STOP mnemonics for scene management.
- Give the rationale for having three separate sequential reports (initial contact report, preliminary situation report, full situation report) for search "finds" and initial rescue contacts.
- Describe how the following communications concepts apply to a WEMT in contact with a Wilderness Command Physician:
 - roles of communication, including direct medical control and medical advice, reporting to Base, arranging support and additional resources, and arranging for the transition from evacuation to transportation;
 - direct communication and "direct medical control";
 - security;
 - acknowledgement;
 - logging and recording messages;
 - using clear English without codes; and
 - standard search and rescue "Status Codes" and their meaning.
- Outline and describe the major components a WEMT's report to a Wilderness Command Physician should include, including:

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- medical information, including: introduction, history (patient ID and chief complaint, history of present illness, and past medical history), physical exam, field diagnoses, treatment thus far;
 - the current situation;
 - tentative plans for further medical care, evacuation, and transportation; and
 - plans for further contact.
- Discuss the variation in estimates of wilderness evacuation time by those trained and untrained in wilderness rescue, and indicate how to provide Base or a Wilderness Command Physician with the means to assess the accuracy of evacuation time estimates.
 - Identify important differences between "street" and wilderness documentation, including:
 - need for durable waterproof records;
 - roles of documentation, including: following trends in vital signs and patient condition, information for other WEMTs who care for the patient during the evacuation, legal documentation, research, quality control and improvement; and, education.
 - Identify important non-patient-care points to include in wilderness patient documentation, including:
 - the environment;
 - the terrain;
 - equipment and personnel limitations;
 - any extrication, packaging, or evacuation problems;
 - the mechanism of injury;
 - the WEMT's decision-making process, and any changes in the field diagnoses over time; and
 - any wilderness-specific treatments the WEMT employed, and documentation of the reasons for employing them.

Preceptor Tasks

- Arrange adequate time off from preceptor's clinical responsibilities to work with resident (24 hours), including attendance at 5-day Wilderness EMT Course; use vacation time if needed.
- Schedule rotation for months when WEMSI Wilderness EMT classes offered.
- Arrange for resident to speak on a Wilderness EMS topic at Allegheny Mountain Rescue Group meeting; schedule at least one other Wilderness EMS lecture by

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resident at Mercy and advertise to area SAR teams and EMS agencies.

- Arrange for resident to offer outreach Wilderness EMS training by talking at meetings of area outdoor clubs, SAR teams, and EMS agencies.
- Arrange for resident to attend any appropriate-level SAR training offered in the area during the month (e.g., *Basic Wilderness Rescue*, *Orientation to Cave Rescue*, local SAR team training sessions).
- Arrange for access to needed library materials through use of Emergency Medicine Association of Pittsburgh (EMAP) library, Mercy medical library, and personal collections.
- Arrange for resident access to computer (at EMAP office) with range of word processors and Grateful Med program, and account for MedLine.
- Arrange for secretarial assistance from EMAP for typing needed documents, if needed by resident.
- Arrange with other Mercy Department of Emergency Medicine attending staff to permit resident to take over their responsibilities for Thursday afternoon intern-medical student lectures during the month.
- Arrange for pager through hospital
- Arrange for resident to be alerted by and accompany local SAR teams on any missions during the month.
- Obtain feedback from resident to improve future rotations.
- Provide evaluation letter for resident at completion of rotation.

Appendix: Minimum Personal Equipment

- Appropriate clothes and footwear for both fair and foul weather;
- Water container of one- to two-liter capacity;
- Day pack (knapsack will be sufficient);
- Five large, heavy-duty plastic trash bags;
- Food for 48 hours;
- Headlamp (or flashlight) and second light source;
- Lighter, matches and candle, or equivalent WATERPROOF fire source;
- Knife;
- Compass;
- Personal First Aid Kit;
- WATERPROOF pen/pencil and paper;
- Whistle; and
- Two pairs plastic or vinyl examination gloves.