



## Risk navigator

# Wilderness medicine

 Primary casualty

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## About Markel's Risk Solution Services team

**Risk Solution Services** provides technical insight related to existing and potential insured risk at Markel. The team partners with our customers, claims, and underwriters to educate on both current and future risk trends and supports our clients with a comprehensive offering of risk management solutions.

We do this by engaging with clients, underwriting, and claims teams.

E-mail our team at [risksolutions@markel.com](mailto:risksolutions@markel.com).



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## Foot injury: Apostle Islands

The stick slid easily between the bottom of the camper's right foot and his open-toed sandal, right into his flesh. The camper screamed in pain and hopped back to the campsite from the beach, unable to bear any weight on his foot. He was now seated, breathing easier, with a 2-inch long driftwood sliver buried into the sole of his foot.

The group was on day three of a seven-day sea kayaking trip to the Apostle Islands. They had several options:

1. Call the National Park Service on their marine radio for a medical evacuation.
2. Begin the all-day paddle from their location, Outer Island, to the mainland.
3. Remove the sliver, clean the puncture wound following the high-risk wound-cleaning wilderness protocol, and continue the trip.
4. Do nothing, and over the next 12 to 36 hours a local infection would develop around the puncture site.

Because a wilderness medicine provider was trained, certified, and authorized by the camp's medical director to use the high-risk wound cleaning protocol, he carefully removed the sliver and cleaned the wound with copious amounts of clean water and a povidone iodine rinse. For the next four days the provider changed the wound dressings frequently and monitored for signs of infection. None were noted and the camper remained healthy.



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## What is wilderness medicine?

Wilderness medicine is any situation in which transport to a hospital-level facility will take more than two hours. Although wilderness medicine is often associated with remote backcountry areas, it can occur in urban settings as well. For example, wilderness medicine may be needed after an earthquake when hospitals become inaccessible. More accurately, a wilderness medical situation has one or more of the following components:

- **Severe environment:** A camp counselor delivering first aid in the field might have to contend with extremes of temperature, poor lighting, clouds of biting insects, loud noise from wind or water, and rain or snow. The environment is more austere than the rustic camp health center.
- **Prolonged patient care:** Standard first aid training is designed to give lay rescuers tools to assess and care for a patient during the four to eight minutes from the 911 call until ambulance arrival. A wilderness medicine provider might care for a patient for 30 minutes, one hour, three hours, all day, or even overnight. In a prolonged patient care situation, the patient's problems can worsen or improve. The wilderness medicine provider is responsible for meeting the patient's needs for shelter, water, food, and hygiene.
- **Improvised equipment:** A wilderness medicine provider has limited tools and equipment for patient assessment, treatment, and transport. For example, providers learn to improvise splints from available materials that are complete, compact, and comfortable. Wilderness medicine providers are only limited by their imaginations and the supplies in their packs.



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## Wilderness medical training

Wilderness medical training is necessary because traditional EMT and first responder courses assume ready access to a hospital-level facility. When hours or days stand between your patient and the hospital, phases of patient care that normally occur in an emergency room must be carried out in the field. As an example, urban EMT courses do not cover reduction of shoulder dislocations because permanent damage is unlikely to occur if a patient reaches an emergency room within two hours. If, however, many hours elapse between dislocation and reduction, permanent damage is possible.



Wilderness medical training is applicable to trip-and-travel camps, adventure programs, and base camps in remote areas. For people without a medical background, two courses teach the concepts and principles required to effectively deliver aid until EMS arrives:

- Wilderness first aid is for situations when the time from injury to EMS arrival is 20 to 30 minutes. This is generally a 16-hour class and covers topics such as anaphylaxis, hypothermia and hyperthermia, fractures and dislocations, and wound care.
- Wilderness first responder is for situations when the time from injury to EMS arrival is greater than two hours. This is generally an 80-hour class. It covers all topics in the wilderness first aid course as well as advanced topics such as spinal cord injuries, cardiac and respiratory emergencies, severe abdominal pain, search and rescue, and near-drowning.

In these courses, students learn simple assessments and treatments, called protocols. For example, students learn to assess the presence of shivering and level of consciousness to differentiate mild hypothermia from severe hypothermia. They learn that the proper treatment for mild hypothermia is to stop heat loss, fuel shivering with calories, and encourage heat retention.

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## Using wilderness protocols

Wilderness protocols are very specific instructions for assessing and treating specific problems such as severe asthma, anaphylaxis, or joint dislocation.

How and when to use wilderness protocols depends on the situation, rescuer training and certification, and authorization from the camp's medical director. Wilderness protocols are designed for prolonged patient care situations. This is often described as the time until the patient reaches a hospital with the staff and resources to assess and provide definitive care for the patient's illness or injuries. The time to reach a hospital often depends on current environmental conditions. For example, a severe storm might make the normal 20-minute trip from camp to the nearest local hospital a four hour expedition.

## Choosing a wilderness medicine vendor

Wilderness medicine vendors provide training and certification. When choosing a wilderness medicine vendor, ask these questions:

- Is the instructor qualified and trained to teach the course?
- Do students receive comprehensive training materials—books, hand-outs and field guides—for use during the course?
- What is the mix of lecture, demonstration, and skills practice during the course?
- Are course curricula and instruction materials regularly reviewed and updated by a physician medical director and faculty committee to reflect current medical knowledge and practice?
- Is student performance measured with written assessments and practical skill evaluation observation by the course instructor?
- What are the course requirements to earn certification?
- Do all students automatically pass the course?

After completing a course, students should receive a certification card, proof of meeting course requirements. Keep a copy of each staff member's certification in his or her file.



<i>Wilderness Medicine Training Center International</i> certifies that			
_____			
has successfully completed the following course in wilderness medicine.			
<input type="checkbox"/> WFA	<input type="checkbox"/> WAFA	<input type="checkbox"/> WFR	<input type="checkbox"/> WEMT
_____	_____	_____	_____
Expiration Date	Instructor's Signature		

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## Working with a medical director

The final step before using a wilderness protocol is medical director authorization. A wilderness protocol expands the rescuer's scope of practice, which demands careful consideration and review from the medical director.

### Understanding the medical director's role

The ideal medical director is a physician who understands your camp program and has experience in wilderness medicine. It is preferable to have a physician with broad experience rather than a specialist.

Depending on the size of your camp program and the activities you offer, the medical director's responsibilities can include the following:

- Develop and sign-off on policies, procedures, and guidelines related to staff medical training and camper medical screening.
- Approve the camp's use of medications, such as injectable epinephrine for allergic reactions.
- Provide follow-up examinations (for OSHA compliance) of staff after exposure to blood-borne pathogens.
- Participate in the safety committee.
- Review incidents and near-misses.
- Conduct an annual review of accident and incident reports.
- Send regular reports to the camp's insurance company.

### Obtaining medical director authorization

Before the camp season begins, the camp medical director, medical or risk-management committee, camp nurse, and other appropriate administrative staff should review the camp's health plan, emergency medical plans, and wilderness protocols. The medical director, at his or her discretion, may modify, expand, or narrow the wilderness protocols for local situations. For example, the medical director may decide camp staff can only reduce patella and digit dislocations, but not shoulder dislocations. Or, the medical director may decide camp staff can remove impaled objects that are safe and easy to remove in any context, regardless of time to a hospital. The medical director should review and authorize wilderness protocols annually.

During pre-camp training the medical director, camp nurse, or wilderness medicine instructor should lead a review of the wilderness protocols, procedures, and related skills for the seasonal staff. For example, use case review discussions or patient assessment drills to review the signs and symptoms of anaphylaxis. After the review, practice administering epinephrine with an auto-injector or syringe.



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## Applying protocols

### Analyzing risk versus benefit

Authorizing staff to use wilderness protocols is about weighing the risk versus benefit. In the opening case study, the camper with a sliver in his foot had a high risk of infection from that wound. A small amount of risk existed for causing further injury by removing the sliver, but that was outweighed by the benefit of removal and thorough wound cleaning. The camper also experienced the extra benefit of continuing the trip as planned with ongoing wound cleaning and dressing.

### Evacuating patients after a protocol is used

An additional discussion for the medical director, camp nurse, and health committee is what to do after a wilderness protocol is used. Camp staff should be advised if evacuation is mandatory or optional based on patient presentation after a wilderness protocol is used. If evacuation is indicated, the urgency of evacuation is based on the patient's current presentation, not their pre-treatment presentation. For example, a patient that is resting comfortably and breathing normally after epinephrine and antihistamine administration for anaphylaxis is a non-urgent and low-risk evacuation. During evacuation the rescuer will continue to monitor the patient for signs of a biphasic reaction.



### Documenting protocols used

Equip your camp first aid kits with appropriate forms to document patient assessment, problem identification, and treatment. If a wilderness protocol is used, it's important to document the specific assessment criteria that the patient presented with and treatments applied. For example, your documentation might read:

Patient presented with signs of anaphylaxis: itching and hives on chest and arms, facial swelling, upper airway swelling, and respiratory distress with audible wheezing. Patient treated with 0.3 mg of 1:1,000 epinephrine delivered by auto-injector and 50 mg of oral diphenhydramine. Patient reassessed every 3 to 5 minutes during evacuation for signs of a biphasic reaction.



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## Risk management plan

Wilderness medicine is part of a larger camp risk-management plan. Many camps benefit from the knowledge and experience of a risk management committee. Recruit pediatric and emergency physicians and nurses that are camper parents or alumni to serve on the committee. Also, consider prehospital providers, such as EMTs or paramedics, from the nearest ambulance service to serve on the committee.

Roles related to wilderness medicine for a risk management committee can include:

- Recommendations on the level of wilderness medicine training appropriate for camp staff
- Review and authorization of wilderness medicine protocols
- Emergency medical equipment available in the camp health center
- First aid kit contents
- Case reviews
- Assessing local medical assets, such as the availability and training of the EMS provider that services your camp

## Summary

Wilderness medicine training is well suited for the remote and potentially severe environments that camp nurses, trip leaders, and camp counselors may encounter. Camps should carefully select a vendor to provide wilderness medical training to their staff. After completion of training, medical director authorization is required before staff can apply the wilderness protocols. The medical director can modify, narrow, or expand the scope of the wilderness protocols. Finally, camps should support use of wilderness medicine training and protocols with appropriate medications and first aid equipment, staff refresher training, and medical director oversight.

By Greg Friese, MS, NREMT-P

Thank you to Ann M. Dunphy, EMT-I, Amanda M. Friese, BSN, and David E. Johnson, MD, for their thoughtful suggestions for this guide.

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