Wilderness Medical Field Protocols

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INTRODUCTION

The protocols described and taught by The Center for Wilderness Safety, Inc. typically exceed the scope of practice of common urban emergency medicine. They are only to be used in a wilderness context where delayed patient care may result in an unacceptable risk to the patient and/or rescuers. For use in a *Duty to Act* setting, these procedures require specific training, certification and medical authorization.

SCOPE OF PRACTICE & AUTHORIZATION

Wilderness first aiders and first responders (providers) are certified to administer care, but are *NOT licensed* or authorized to practice medicine. Many interventions require the provider to work directly under the authorization of a physician who is overseeing a program or organization. The physician that oversees a particular program or organization providing "medical control" shares the liability of the caregiver's actions. The *Scope of Practice* is the boundary of the type and complexity of interventions the provider has been taught to perform in the field; not specifically what he or she is allowed to do under the direct medical control and direction of a governing physician. Protocols are what the provider is ALLOWED to do under the auspices of medical direction (usually because they are authorized under a governing organization).

These protocols were written by Jeffrey Isaac, PA-C (of Wilderness Medical Associates International) and have been edited and authorized by Kathryn Vaughn, MD & Clifton Castleman, WEMT, for use by The Center for Wilderness Safety, Inc.

WILDERNESS MEDICAL FIELD PROTOCOLS

Written by Jeffrey Isaac, PA-C (Wilderness Medical Associates); edited & authorized by Kathryn Vaughn, MD & Clifton Castleman, WEMT

Wilderness medicine is not a new concept. It was practiced for tens of thousands of years before modern civilization developed. The healers of centuries past were limited by circumstance to generic diagnoses and simple and adaptable equipment and treatments. A patient's medical problem was just a small part of a much larger picture that included weather, terrain, hazards, predators, mobility, and limited supplies of food and water.

Only in the past two centuries or so has civilized medicine been able to eliminate the environmental obstacles to providing care, allowing healers to focus on the medical problems before them. Aside from the occasional disaster situation, a hospital emergency department is free of wind, rain, rocks, and slope angle. The lights are always on and the temperature is ideal, and the patient's medical problem is the only issue the staff needs to worry about.

This freedom from want and fear led to an explosion of medical knowledge and technology. The dramatic influence on morbidity and mortality is evident almost everywhere in the world. In one of the most effective medical developments of the 20th century, Emergency Medical Services (EMS) systems have extended some of these sophisticated technologies and procedures to communities far removed from the hospital.

However, while emergency medicine has changed dramatically in recent history, the wilderness has not. In truly wild places, the wind, rain, snow, and rock presents just as much of a challenge to the medical provider as it did ten- thousand years ago. The patient's medical problem remains just a small part of a much larger environmental picture. The same can be said of urban disasters, combat, and high angle rescue situations in which access to definitive medical care is delayed.

In some cases, helicopters are able to pluck people from peril and deliver them intact to the hospital. In most cases, it is the medical officer on the ground or rock face that is required to deliver care, sometimes for hours or days. The professionals and volunteers who are expected to provide this service need a scope of practice, standard of care, and regimen of training that works in a context of delayed access, difficult evacuations, and limited diagnostic and treatment resources. The re-emergency of the art of wilderness medicine has gone a long way toward providing that framework.

As the field grows, wilderness medical providers need to be free of the expectation that the techniques and equipment available and appropriate to the ambulance are going to be equally useful in the wilderness. On the other hand, they also need to be free to apply techniques and principles that may not be allowed or appropriate for use by street EMS providers. The development and use of Wilderness Medical Protocols defines a scope of practice and standard of care in specific cases where the needs of wilderness and disaster rescue teams differ from the current practice and protocols of street EMS.

Acceptance of the concept by the medical and EMS establishment in the United States has been variable and sometimes controversial. This is understandable, considering that the protocols authorize basic level field providers to use techniques and medications typically reserved for licensed medical practitioners. A Wilderness First Responder, for example, may be allowed to reduce dislocations and "clear" spines where the paramedic or EMT on-scene cannot.

However, the use of such protocols has increased significantly in recent years. Large organizations like Outward Bound have been using wilderness protocols for over two decades with good results. A number of state and federal agencies have adopted and used wilderness protocols as well. The experience from the field indicates that well-trained providers at the WFR and WEMT level can safely and effectively use these techniques.

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AUTHORIZATION AND ACCEPTANCE OF

The CWS – WILDERNESS MEDICAL FIELD PROTOCOLS

Conventional First Aid and EMT curricula are designed for an urban environment, and assume the availability of 911 communications as well as rapid transport to a hospital. Backcountry outfitters and experiential educators have found the conventional medical protocols do not address the specialized wilderness context of delayed rescue transport in remote areas, prolonged exposure to severe environments, and the limited availability of medical equipment.

These protocols have been developed for use by appropriately trained individuals that regularly work in remote environments. They are based upon the principles taught by The Center for Wilderness Safety, Inc. through Wilderness EMT, Wilderness First Responder, Wilderness Advanced First Aid and Wilderness First Aid training courses.

AUTHORIZATION CRITERIA

Authorization for use of these protocols is granted to employees of the above named employer only under the following conditions:

1. The employee is currently working for the above named employer in a capacity that places them in a wilderness or remote "wilderness" setting or "wilderness context".
2. The transportation time to a hospital exceeds one hour.
3. The employee holds an unexpired Wilderness EMT (WEMT), Wilderness First Responder (WFR), Wilderness Advanced First Aid (WAFA) or Wilderness First Aid (WFA) certification from the Center for Wilderness Safety, and the employee follows the materials, skills and protocols learned in their course. WAFA and WFA certified employees may only use protocols 1, 2, 4 and 6. WFR and WEMTs may use all 6.

IMPORTANT NOTE

This document is not designed to be used as a reference for wilderness medical providers. Providers should refer to their original course textbooks for complete information on the use of these protocols.

The above specified protocol has been authorized for use by The Center for Wilderness Safety, Inc. for WEMT, WFR, WAFA, And WFA trained employees of the employer named on page one of this document provided they meet the requirements of the authorization criteria listed below.

Organization or Company Name	***Date***
Authorized Representative & Position	***Physician Advisor***
Authorized Representative Signature	***Physician Advisor Signature***

- FIELD PROTOCOL 1 -

CARDIOPULMONARY RESUSCITATION IN REMOTE SETTINGS

This protocol applies only to normothermic patients (core temperature > 90° F, 32° C) in cardiac arrest. Chest compressions are initiated for patients in cardiac arrest evidenced by pulselessness. To be effective, CPR must be started promptly. Even then, its benefits are limited.

1. *Assess and treat according to standard CPR protocols.*
2. *If cardiac arrest persists continuously for over 30 minutes of sustained chest compressions and assisted ventilations all treatment may be stopped.*

There are some circumstances where CPR should not be started. These include:

1. *Any pulse less person who has been submersed in water for more than one hour and not connected to a source of air.*
2. *Any pulse less person with an obvious lethal injury (i.e. decapitation, exsanguination). This would include severe trauma to the chest that would prevent CPR or an open brain injury.*

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- FIELD PROTOCOL 2 (BLS) -

ADMINISTRATION OF EMERGENCY MEDICATION FOR ASTHMA

Asthma is an inflammatory disease of the airways that results in more than 450,000 hospital admissions and 5,000 fatalities a year. Every patient with asthma is at risk for a severe, acute exacerbation that requires aggressive management. The newly developed Guidelines for the Diagnosis and Management of Asthma: Expert Panel Report II, published in 1997 includes recommendations for all phases of asthma management.

Early recognition and prompt treatment, particularly in the wilderness setting may be essential to preserve life.

***An asthma exacerbation is indicated by the presence of several, but not necessarily all of the parameters listed. These parameters serve as guides.**

BLS TREATMENT FOR SEVERE ASTHMA

Patients who have progressed to severe asthma experience a combination of the following:

- Shortness of Breath (>30 respirations /min)
- Mental status changes (anxious, confused, combative, drowsy, etc.)
- Inability to speak in sentences
- Sweaty
- Unable or unwilling to lie down

If the patient is not responding to or is unable to properly use an MDI (metered dose inhaler), proceed to the following:

1. *Start supplemental oxygen if available: 4-6L/min by nasal canula or 10-15 L/min with a NRM (non-rebreather mask).*

2. *Inject 0.01 mg/kilogram up to 0.3 mg of 1:1000 solution of epinephrine into the lateral aspect of the deltoid, or the anterior aspect of the thigh (either subcutaneous or intramuscular).; if clinically indicated, repeat dose every 5 minutes for two additional doses.**

3. *Administer prednisone at 40 - 60 mg (or equivalent dose of an oral corticosteroid).*

4. *Initiate assisted ventilations (PPV) if breathing becomes ineffective (gasping or shallow respirations or if AVPU or less). Maintain a rate of 8-10 bpm.*

5. *Once able to do so have patient self-administer 4-6 puffs from the MDI. Use a spacer if available. May repeat every 20 minutes as needed.*

6. *Evacuate the patient*

*There is 1mg of epinephrine in 1 mL of epinephrine 1/1000; there are 0.3 mg in 0.3 mL of 1/1000. Preloaded commercially available injectors deliver either 0.3 mg (standard adult dose) or 0.15 mg (standard pediatric dose). If the person weighs less than 66 lbs (30 kg), the doses are: epinephrine is 0.01 mg/kg; prednisone is 1 - 2mg/kg. When using lbs., multiply the weight times 0.45 to get the weight/mass in kilograms.

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- FIELD PROTOCOL 2 (ALS) -
ADMINISTRATION OF EMERGENCY MEDICATION FOR ASTHMA

If patients progress to respiratory failure and develop any combination of the following:

- Gasping or shallow respirations or retractions between ribs on inspiration
- AVPU or less
- O2 sats of <90% on supplemental oxygen

1. Initiate advanced airway management. Maintain a rate of 10-15bpm.

    - Poor lung compliance may be present (as evidenced by difficulty getting air in). Providing increased inspiratory flow/pressure may be necessary to ventilate the patient. Allow adequate time for exhalation.

    - The increased ventilatory pressures can lead to barotrauma i.e., simple or tension pneumothorax. Monitor carefully. If the following S/Sx occur; new absence of lung sounds, and clinical deterioration i.e., decreased perfusion, decreased O2 sats, decreased mental status, initiate a chest decompression using the standard technique.

2. Continue beta-agonist inhaler agents through the ET tube if possible.

3. Continue with the administration of epinephrine as noted above.

Contributing factors such as cold temperatures, stress, and exercise should be controlled as much as possible.

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- FIELD PROTOCOL 3 -

SPINAL INJURY ASSESSMENT AND CLEARANCE

In an urban context all patients that are involved in a traumatic event that may have caused a spine injury are treated as though they are spine injured. In a wilderness context, clearing a potential spine injury when there is a positive mechanism for such an injury requires careful evaluation that focuses on patient reliability, nervous system function, and spinal column stability. Adequate time must be allowed for the evaluation. Repeat examinations may be necessary.

1. *Assess for mechanism of spine injury. If positive or uncertain mechanism exists, protect the spine by whatever method is available. This could include but is not limited to hand stabilizing in the in-line position.*

2. *Do a thorough evaluation including a history and physical examination. To rule out a spine injury the patient must meet all of the following criteria:*
    a. *Patient must be reliable. The patient must be cooperative, sober, and alert, and must be free of other distracting injuries significant enough to mask the pain and tenderness of the spine injury.*
    b. *Patient must be free of significant spine pain and tenderness consistent with a spinal injury.*
    c. *Patient must have normal motor/sensory function in all four extremities:*

        - *Finger, hand, or wrist motion (check both hands)*
        - *Ankle or great toe motion (check both feet)*
        - *Normal sensation to pain and light touch in all four extremities*
        - *If reduced function in one particular extremity can be attributed with certainty to a condition unrelated to a potential spine injury (wrist fracture, for example), that deficit alone will not preclude ruling out a spine injury, because the motor/sensory assessment contain built-in redundancy.*

3. *If a spine injury has not been ruled out, the patient must be fully immobilized except in the following case. In a wilderness context, with a reliable patient who has normal motor/sensory function, if spine pain and tenderness can be isolated to the lumbar area, the patient's head may be left free. Likewise, if the injury involves only the c-spine, the hips may be left free for patient comfort.*

4. *Arrange evacuation.*

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- FIELD PROTOCOL 4 -

WOUND CLEANING & DEBRIDEMENT

In the management of all wounds, bleeding must be controlled using well-aimed direct pressure with whatever means are necessary. Control of severe bleeding is a higher priority than wound cleaning. Once bleeding has been controlled:

OPEN WOUNDS

1. *Remove foreign particulate material as completely as possible.*
2. *Wash the surrounding skin with soap and water.*
3. *Irrigate the wound with at least 100 ml (ideally 1000 ml) of the cleanest water available. Highly contaminated wounds (i.e. some particulate material remaining, deep punctures, dead tissue within and/or surrounding the wounds, bites, open fractures, injuries involving damage to underlying structures) may be irrigated with and covered by a bandage soaked in a 1% povidine-iodine solution.*
4. *Cover the wound with a sterile bandage and immobilize the wound area if possible. Splint if necessary. Do not close with sutures or adhesive closure strips (CWS advocates closing simple, clean wounds with steri-strips or butterfly closure strips).*
5. *Change the bandage and clean the wound daily with soap and clean water.*
6. *If signs of infection appear (i.e. red tender, swollen, drainage purulent material, apply warm compresses, allow drainage, and irrigate open wounds. Infected wounds should be immobilized if possible.*
7. *Assess need for tetanus prophylaxis. High-risk wounds require tetanus prophylaxis every five years, all others every ten. Decide if patient needs to be evacuated for immunizations.*
8. *If the wound was the result of an animal bite, assess the risk of rabies exposure. The probability of rabies exposure from animal bites varies by animal and geographic location. Check with state or local health agency for recommendations. Generally, a period of several days between the bite and immunization is considered safe.*

IMPALED OBJECTS

1. *Only remove impaled objects when they interfere with safe transport or they cannot be effectively stabilized (i.e. will cause more damage if left in place) and then only if removal can be done safely and easily.*
2. *Treat as an open wound (see above).*

Discussion: Field providers are often rushed to evacuate an open wound because of the perception that wound closure (sutures) must be accomplished within six or eight hours of injury. In the EMS context with short transport times, it makes sense to bandage and transport an open wound for care in the clean and controlled environment of a hospital or clinic. However, it is not so much the time to closure that matters, as it is the time to wound cleaning. Early and complete wound cleaning substantially reduces the chance of later infection. In the remote environment where definitive care will be delayed, thorough irrigation and debridement of an open wound reduces the urgency of evacuation and leads to a better long term outcome.

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- FIELD PROTOCOL 5 -

REDUCTION OF DISLOCATIONS

This protocol specifically applies to dislocations of the shoulder, patella, and digits resulting from an indirect force; all other potential dislocations should be treated as one would treat any other potentially unstable joint injury (i.e. splint in a position that maintains stability and neurovascular function while facilitating transport). A history confirming that there has been no direct injury to the affected joint and an examination with findings consistent with a dislocation must be obtained prior to treatment. The following procedures should be stopped if pain increases and/or resistance are encountered.

SHOULDER

1. *Check and document finger motion and sensation over the fingers and deltoid region of the affected side.*
2. *With the patient is on his or her back and while sitting adjacent to the dislocated shoulder, apply gentle traction to the arm to overcome muscle spasm. Gradually abduct and externally rotate the arm until it is at a 90-degree angle to the patient's body. This is most easily achieved by keeping the elbow in the 90 degrees of flexion throughout the maneuver. Hold the arm in this position ("baseball throwing position") and maintain traction until the dislocation has been reduced.*
3. *An alternative method of reduction takes advantage of gravity. Ten pounds is secured to the patient's arm while she is lying face down with her arm hanging unsupported. This process can be facilitated if the rescuer stabilizes the upper portion of the scapula with one hand while rotating the lower tip medially with the other. Reassess and treat in the same fashion after the reduction is complete.*
4. *Once either the dislocation is reduced or the rescuer decides to discontinue reduction attempts, adduct the humerus so that the elbow is alongside the body. Then internally rotate the arm across the body and sling and swathe.*
5. *Reassess and document distal neurovascular status.*
6. *Transport patient to hospital.*

PATELLA

1. *Check and document motion and sensation of foot and toes.*
2. *Gently straighten the patient's knee and flex the hip. If the patella does not spontaneously reduce, gently guide the displaced patella medially back into its normal anatomic position.*
3. *Splint the knee in a neutral position (10-15 degrees of flexion).*
4. *Reassess and document distal neurovascular status.*
5. *Transport patient to hospital. Patient may walk out if pain is tolerable.*

DIGITS (Fingers and toes, not including thumb)

1. *Check and document motion and sensation of fingers.*
2. *Stabilize the hand and gently pull in the direction of the distal finger until the dislocation has been reduced.*
3. *Splint in the anatomical position.*
4. *Reassess and document distal neurovascular status.*
5. *Transport patient to hospital.*

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- FIELD PROTOCOL 6 -

ADMINISTRATION OF EMERGENCY MEDICATION FOR ANAPHYLAXIS

Anaphylaxis is an allergic reaction that has life-endangering effects on the circulatory and respiratory systems. Anaphylaxis is an almost immediate, rapidly progressive multisystem allergic reaction to a foreign protein injected into the body by stinging and biting insects, snakes, and sea creatures or ingestion or inhalation of food, chemicals, and medications,. Early recognition and prompt treatment, particularly in a wilderness setting, is essential to preserve life. The onset of symptoms usually follows quickly after an exposure (minutes after a sting or bite, within 30-60 minutes following ingestion). Rebound or recurrent reactions can occur within 24 hours of the original episode.

In addition to shortness of breath, weakness and dizziness, victims also frequently complain of a sense of impending doom, cough, chest tightness, trouble swallowing, abdominal cramps, or generalized itching. Physical findings include rapid heart rate, low blood pressure, and other evidence of shock, upper airway obstruction (stridor) and lower airway obstructions (wheezes) with labored breathing, generalized skin redness, hives, and swelling of the mouth, face, and neck. Epinephrine should only administered to patients having symptoms suggestive of an acute systemic reaction (i.e. generalized skin rash, difficulty breathing, fainting, or facial swelling).

1. *Maintain an open airway, assist ventilations if necessary, and put patient in a position of comfort. Initiate CPR if necessary.*
2. *Inject 0.3 mg of 1/1000 epinephrine into the lateral aspect of the deltoid, or the anterior aspect of the thigh (either subcutaneous or intramuscular).**
3. *Repeat injections every 5 minutes if condition worsens or every 15 minutes if condition does not improve, for a total of up to three doses.*
4. *Administer 50-100 mg of diphenhydramine by mouth every 4-6 hours if the patient is awake and can swallow.*
5. *Consider Prednisone 40 – 60 mg / day (or equivalent dose of an oral corticosteroid).*
6. *Because a rebound reaction can occur, all victims of an anaphylactic reaction should be evacuated. Rebound reactions should be treated in the same manner as the initial reaction, using epinephrine in the same dosage.*

* There is 1mg of epinephrine in 1 mL of epinephrine 1/1000; there are 0.3 mg in 0.3 mL of 1/1000. Preloaded commercially available injectors deliver either 0.3 mg (standard adult dose) or 0.15 mg (standard pediatric dose). If the person weighs less than 66 lbs (30 kg), the doses are: epinephrine is 0.01 mg/kg; diphenhydramine is 1mg/kg; and prednisone is 1 - 2mg/kg. When using lbs, multiply the weight times 0.45 to get the weight/mass in kilograms.

Note to consulting physician: the organization will need a prescription from you to obtain injectable epinephrine. It is available in the following forms: Twinjects, Epi-Pens® and manual injection methods. Over the counter diphenhydramine should always be carried in addition to injectable epinephrine.

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