

WILDERNESS MEDICINE FIELD PROTOCOLS

PURPOSE

Conventional First Aid and EMT curricula are designed for an urban environment, and assume the availability of 911 communications and rapid ambulance transport to a hospital. Outdoor professionals 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 on the principles taught by Wilderness Medical Associates in Wilderness Advanced Life Support, Wilderness EMT, Wilderness First Responder, Wilderness Advanced First Aid, and Wilderness First Aid Courses.

AUTHORIZATION

Because the specialized nature of these protocols, it is generally recommended that the integration of these procedures into the emergency response field practices of outdoor and adventure education programs be specifically authorized by the management of the program, preferably with the guidance of an appropriate consulting medical professional. (See the Wilderness Medical Associates document entitled 'Consulting Physicians for Backcountry Outfitters and Experiential Education Organizations' for more information.)

The following conditions are recommended by Wilderness Medical Associates, and should be considered in establishing authorization of the use of these protocols into a program's emergency response plans:

1. The employee is on the job for the above named employer.
2. The transportation time to a hospital exceeds two hours except in the case of an anaphylactic reaction in which no minimum transport time is required.
3. The employee holds an unexpired Wilderness Advanced Life Support (WALS®), Wilderness and Rescue Medicine (WRM), Wilderness EMT (WEMT), Wilderness First Responder (WFR), Wilderness Advanced First Aid (WAFA), or Wilderness First Aid (WFA) certification from Wilderness Medical Associates, and the employee follows the specific procedures and techniques followed in that course. WAFA certified employees may only use protocols 1, 2, 3 and 4. WFA certified employees may only use protocols 1 and 2. (Careful review of the medical training background of employees is recommended to ensure complete understanding of these protocols by all employees.)

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 those employees who are trained and certified in this skill as specified above.

Organization

Date

Authorized Representative

Position

Physician Advisor

PROTOCOL 1: ANAPHYLAXIS

Anaphylaxis is an allergic reaction that has life-endangering effects on the circulatory and respiratory systems. Anaphylaxis can result from an exposure to a foreign protein injected into the body by stinging and biting insects, snakes, and sea creatures as well as from the ingestion 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, often within minutes. The signs and symptoms reflect the resulting consequences of generalized vascular dilation, fluid leakage and lower airway constriction. Biphasic or recurrent reactions can occur within 24 hours of the original episode.

In addition to shortness of breath, weakness and dizziness, patients also frequently complain of generalized itching (particularly in the armpits and groin area). 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, urticaria (hives), and swelling of the mouth and face. Epinephrine should only be administered to patients having symptoms suggestive of acute anaphylaxis, an allergic reaction with systemic components.

1. Maintaining an open airway, put patient in a position of comfort. Initiate either positive pressure ventilations (PPV) or cardiopulmonary resuscitation (CPR) as indicated by clinical signs.
 2. Inject 0.01 mg/kilogram (up to 0.3 mg) of 1:1000 solution of epinephrine* intramuscularly into the lateral aspect of the thigh or deltoid.
 3. Repeat injections as soon as every 5 minutes if needed. More than 3 injections are rarely necessary.
 4. Administer 25 – 50 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 biphasic reaction can occur within the subsequent 24 hours, all patients experiencing an anaphylactic reaction should be evacuated to definitive care. Biphasic reactions should be treated in the same manner as the initial reaction, using epinephrine in the same dosage.
 7. Arrange for transport to hospital
 8. Consider an advanced life support intercept (ALS) if possible
 9. The patient should remain out of the field for at least 24 hours and may not return without the examining healthcare professional's approval.
- * -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 autoinjectors 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.

PROTOCOL 2: WOUND MANAGEMENT

In the management of all wounds, bleeding must be controlled by using whatever means are necessary. Well-aimed direct pressure is the preferred means and is almost always successful. Control of severe bleeding is a higher priority than wound cleaning. Once bleeding has been controlled:

OPEN WOUNDS

1. Cleaning a wound will involve a combination of the following procedures in an order that seems appropriate:
 - a. Remove foreign particulate material as completely as possible.
 - b. Wash the surrounding skin with soap and water.
 - c. Irrigate the wound with at least 100 ml (ideally 1000 ml) of the cleanest water available. A final wash should be made with water of drinking quality.
2. Except for punctures, all other high-risk wounds (e.g., some particulate material remaining, deep punctures, devitalized tissue within and/or surrounding the wounds, bites, open fractures, injuries involving damage to underlying structures) should be irrigated with large amounts of water under pressure. Ideally, pressure devices could include a 30 or 60cc with an 18 gauge catheter. If the wound cannot be completely cleansed because of residual foreign material or because of insufficient water, rinse the wound out with 1% povidone-iodine solution.
3. Cover the wound with a sterile bandage and splint or otherwise immobilize high-risk wounds if possible. Do not close with sutures or adhesive closures (butterflies).
4. Change the bandage and clean the wound regularly.
5. If an infection develops (e.g., red, tender, swollen, drainage of pus), apply warm compresses, allow drainage and irrigate open wounds. Infected wounds should be splinted or otherwise immobilized if possible.
6. Assess need for tetanus and rabies prophylaxis. High-risk wounds require tetanus prophylaxis every five years, all others every ten.
7. 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 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. Antibiotic prophylaxis may also be indicated.

SHALLOW WOUNDS (ABRASIONS AND MINOR BURNS)

1. Cleanse the wound with drinking quality water or a 1% povidone-iodine solution.
2. Apply an antibacterial ointment or cream and cover with a sterile, non-adherent bandage. Immobilize wound area if possible.
3. Inspect the wound and change the bandage regularly.

IMPALED OBJECTS

Remove all impaled objects unless doing so would cause further harm. Exceptions include impaled objects in the globe of the eye or when removal would result in severe pain or bleeding. Remove objects that interfere with safe transport or will cause more damage if left in place. After removal, treat as an open wound (see above).

NB: Some wounds may require additional treatment not possible in the field. These could include infections, unremoved impaled objects, high-risk wounds that cannot be adequately cleaned and injuries requiring cosmetic repair. Under such circumstances, arrange for transport to hospital.

The above specified protocol has been authorized for use by Wilderness Medical Associates WAL^S®, WRM, WEMT, WFR, WAFA, and WFA trained employees of the employer named on page one provided that they meet the requirements of the authorization criteria listed on page one.

Organization

Date

Authorized Representative

Position

Physician Advisor

PROTOCOL 4: SPINE INJURIES

Spinal assessment criteria allow rescuers to determine the need and justification for spine stabilization in the presence of an uncertain or positive mechanism of injury. This evaluation focuses on patient reliability, spinal column stability and neurologic function. Adequate time must be allowed for the evaluation. A clear assessment means that there is no significant spine injury and no need for spine stabilization.

1. Assess the mechanism. If a positive or uncertain mechanism exists, protect the spine by whatever method is feasible and available. This could include (but is not limited to) manual stabilization in the in-line position.
2. Do a thorough evaluation including a history and physical examination. To rule out a significant 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 spine pain and tenderness.
 - c. Patient must have normal motor/sensory function in all four extremities:
 - Finger abduction or finger or wrist extension against resistance (check both hands)
 - Foot plantar flexion/extension or great toe dorsiflexion (check both feet)
 - No complaint of numbness and sensation intact to sharp and dull stimuli in all four extremities
 - If reduced function in one particular extremity can be attributed with certainty to a specific extremity injury (e.g., unstable wrist injury), that deficit alone will not preclude ruling out a spine injury.
3. If a significant spine injury cannot be ruled out, the patient should be stabilized in a safe and comfortable position on a board, litter or other appropriate carrying device. Arrange for transport to hospital.

NB: There are situations in wilderness and technical rescue where the risk of spine stabilization exceeds the presumed benefit. In these circumstances spinal stabilization may be deferred or modified until risk can be mitigated. In unstable scenes or with unstable patients the remote possibility of exacerbating a spine injury may not justify the additional risk associated with stabilization.

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PROTOCOL 5: JOINT DISLOCATIONS

This protocol specifically applies to reducing 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 an indirect injury to the affected joint and an examination with findings consistent with a dislocation must be obtained prior to attempting a reduction.

SHOULDER

1. Check and document distal neurovascular function including sensation over the deltoid region of the affected side.
2. With the patient supine and while still 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. Discontinue the procedure if pain significantly increases and/or if physical resistance is encountered.
3. Alternative methods of reduction include simple hanging traction and scapular manipulation. In addition, these two can be combined with the patient either lying facedown or sitting upright.
 - a. Hanging traction: Have the patient lie facedown with the affected arm hanging unsupported. Secure approximately 3 – 5 kilograms to the patient's hand and allow the weight and gravity to fatigue the muscles until the shoulder is reduced.
 - b. Scapular manipulation (This procedure may require 2 rescuers) – Have the patient either lie facedown (as above) or sit upright. Apply traction to the affected arm and bring it forward to shoulder level. While maintaining traction, stabilize the upper portion of the scapula with one hand and rotate the lower tip medially with the other hand.
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. Use a sling without a swathe for comfort, allowing for some degree of external rotation if possible.
5. Reassess and document distal neurovascular status.
6. Arrange for transport to hospital.

PATELLA

1. Check and document distal neurovascular function.
2. Gently straighten the patient's knee and flex the hip. If the patella has not spontaneously reduced once the knee is fully extended, gently guide the displaced patella medially back into its normal anatomic position. Discontinue the procedure if pain significantly increases and/or if physical resistance is encountered.
3. Splint the knee in a neutral position (10-15 degrees of flexion). Stabilize the patella by taping or bracing it in place.
4. Reassess and document distal neurovascular status.
5. Arrange for transport to hospital. Patients may walk out if pain is tolerable.

PROTOCOL 6: SEVERE ASTHMA

Asthma is a chronic inflammatory disease of the airways that results in frequent hospital admissions. Fatalities occur each year. Every patient with asthma is at risk for a severe, acute exacerbation that requires aggressive management. Early recognition and prompt treatment, particularly in the wilderness setting may be essential to preserve life.

BLS ASSESSMENT AND TREATMENT FOR SEVERE ASTHMA

Patients in respiratory distress from asthma who are not responding to their medications are at risk of further deterioration. In addition to anxiety, they may exhibit any of the following:

- Shortness of breath with prolonged exhalation and wheezing
- Tachycardia (>100)
- Inability to speak in sentences
- Sweaty
- Inability or reluctance to lie down
- Further deterioration in mental state (e.g., confused, combative, drowsy)

If respiratory distress persists or worsens despite the use of a β -agonist rescue inhaler or if one is not available or functioning properly, proceed to the following:

1. While offering reassurance, have the patient assume a position of comfort
2. Start supplemental oxygen if available: 4-6L/min by nasal cannula or 10-15 L/min with a NRM (non-rebreather mask).
3. Inject 0.01 mg/kilogram (up to 0.3 mg) of 1:1000 solution of epinephrine* intramuscularly into the lateral aspect of the thigh or deltoid.
4. Repeat injections as soon as every 5 minutes if needed. More than 3 injections are rarely necessary.
5. Administer prednisone at 40 - 60 mg (or equivalent dose of an oral corticosteroid).
6. Initiate PPV if breathing becomes ineffective (e.g., gasping or shallow respirations). Maintain a rate of 10-12 breaths per minute.
7. Once able to do so, have the patient self-administer 6-10 puffs from the MDI. This may be repeated every 20 minutes for a total of three doses.
8. Arrange for transport to hospital.
9. Consider an advanced life support intercept (ALS), if possible.

* 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 autoinjectors 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.

