



Wilderness Medicine Field Protocols

Purpose

These protocols have been developed for use by appropriately trained individuals working in remote, high risk, and low resource environments. They are based on the concepts and principles taught by Wilderness Medical Associates international, and address specific low risk medical procedures for the treatment of high-risk problems.

Authorization

It is recommended that the integration of these procedures into the emergency response practices of agencies and programs be specifically authorized by the management of the agency or program, preferably with the guidance of a medical director or advisor familiar with field medicine and the area of operation.

It is recommended that these protocols be authorized by certification level: Wilderness Advanced Life Support (WALS®), Wilderness Emergency Medical Technician (WEMT), and Wilderness First Responder (WFR) may use all protocols. Wilderness Advanced First Aid (WAFA) certified practitioners may only use protocols 1, 2, 3 and 4. Wilderness First Aid (WFA) certified practitioners may only use protocols 1 and 2. A careful review of the medical training program is recommended to ensure complete understanding of these protocols and their application.

The following conditions for authorized use of these protocols are recommended:

1. The practitioner is on the job for the authorizing agency or program.
2. The practitioner holds a current Wilderness Medical Associates International certification.
3. The credentials and competence of the practitioner has been verified by agency or program management.
4. Application of the protocol will reduce risk, relieve pain, and improve outcome.

Important Note

This document is not designed to be used as a stand-alone reference. Practitioners should refer to their course textbook, lecture notes, and field guide for complete information on the use of these protocols.

Protocol 1: Anaphylaxis

Anaphylaxis is a systemic allergic reaction that has life-threatening effects on the circulatory and respiratory systems. Early recognition and prompt treatment with epinephrine is essential.

1. Inject 0.01 mg/kilogram (up to 0.5 mg) of 1 mg/ml solution of epinephrine intramuscularly (IM) into the lateral mid-thigh. A dose of 0.3 to 0.5 mg is appropriate for the average adult.
2. Maintain an open airway and position of comfort. Initiate either positive pressure ventilations (PPV) or full cardiopulmonary resuscitation (CPR) as indicated.
3. Repeat epinephrine injections as soon as every 5 minutes if needed.
4. Administer an antihistamine by mouth (for the average adult e.g.; diphenhydramine 25–50 mg every 4-6 hours; cetirizine 10 mg daily).
5. Consider prednisone by mouth (for an average adult e.g.; 40-60 mg/day).
6. Evacuate to hospital care if safe to do so. Consider an advanced life support intercept.
7. If evacuation is not possible, monitor carefully for biphasic reaction. Repeat treatment per protocol as necessary.

Note: The preferred concentration of epinephrine for IM injection is 1 mg/1 ml. Although the lateral mid-thigh is preferred, an injection into the deltoid may be the only practical option.

Commercially available auto-injectors such as the EpiPen deliver either 0.3 mg or 0.5 mg as a standard adult dose or a 0.15 mg or 0.1 mg for a smaller person (less than 55 lbs; 25 kg), depending on body mass. The auto-injector is the most user-friendly device, but also the most expensive. Epinephrine is also supplied in 1 ml ampules, and vials of various sizes, for a fraction of the cost. WMAI graduates at the WALs, WEMT, and WFR level are trained in the use of syringes, needles, vials, and ampules for this purpose.

For patients weighing less than 55 lbs (25kg), the doses are: epinephrine 0.01 mg/kg or the appropriate auto-injector; diphenhydramine 1 mg/kg; cetirizine 2.5 mg under 6yo, 5-10 mg for 6 yo and above; and prednisone 1 mg/kg up to 60 mg. Multiply the weight in pounds by 0.45 to get the weight in kilograms.

The organization may need a prescription from a medical advisor to obtain the injectable epinephrine, syringes and prednisone used in the protocol. Antihistamines do not require a prescription in the United States and Canada. It is essential for prescribers and organizations to be familiar with state, provincial, or national regulations that may address the prescribing of medication and the acceptable means of injecting epinephrine.

Protocol 2: Wound Cleaning and Debridement

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) Explore the wound and remove foreign material as completely as possible.
 - b) Wash the surrounding skin with soap and water or other specified cleanser.
 - c) Irrigate the wound with water clean enough to drink. Water preparation can be accomplished by filter, chemical, ultraviolet, or reverse osmosis. Water of questionable quality should be sterilized by creating a 1% povidone iodine solution.
2. High risk wounds (imbedded debris, devitalized tissue, bites, open fractures, deep structure involvement) should be irrigated with large amounts of water under pressure (e.g.: using a 30 or 60cc syringe with an 18 gauge catheter). If the wound cannot be completely cleansed of foreign material or the quantity of irrigation water is insufficient, rinse the wound with 1% povidone-iodine solution. DO NOT use pressure irrigation on puncture wounds where irrigation fluid cannot easily drain away.
3. Cover the wound with a sterile bandage, but allow for drainage. Splint or otherwise immobilize high-risk wounds if safe to do so. Do not close a high risk wound with sutures or tape.
4. Change the bandage and clean the wound at least daily.
5. If an infection develops (e.g., red, tender, swollen, drainage of pus), irrigate with clean water, allow for drainage, and apply warm compresses. Infected wounds should be evacuated to medical care promptly.
6. High-risk wounds require tetanus prophylaxis every five years, all others every ten.
7. Animal bite wounds require risk assessment for rabies exposure. The probability of rabies varies by geographic location. Check with state or local health agency for recommendations. Prophylaxis should be administered as soon as possible, but 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. Clean the wound with drinking of quality water or a 1% povidone-iodine solution.
2. Apply an antibacterial ointment and cover with a clean dressing.
3. Inspect the wound and change the dressing as needed.

IMPALED OBJECTS

Impaled objects should be removed in the field and the wound cleaned as soon as practical. Exceptions include objects in the globe of the eye, and situations in which removal would result in significant tissue damage, intractable pain, or bleeding that cannot be controlled.

Note: The Medical Advisor should consider extending this protocol to include antibiotic use in settings where access to medical care will be delayed and the consequence of wound infection is high.

The Wound Cleaning and Debridement protocol has been authorized for use by Wilderness Medical Associates International WAL^S®, 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
_____ Medical Advisor	

Protocol 3: Cardiopulmonary Resuscitation (CPR)

Wilderness Medical Associates International teaches CPR according to current standards supported by the 2015 International Liaison Committee on Resuscitation (e.g., The American Heart Association, Heart and Stroke, European Resuscitation Council). This protocol amends those standards for remote and high-risk situations.

This protocol applies only to normothermic patients (core temperature > 90° F, 32° C).

CPR should *not* be started, or may be discontinued at some point after initiation:

1. Cardiorespiratory arrest after submersion in water for more than one hour in the absence of a source of air such as SCUBA equipment or an air pocket.
2. Obvious lethal injury such as decapitation, exsanguination, or massive head injury.
3. Where cardiac arrest persists continuously for over 30 minutes of sustained CPR.
4. Where rescuers are at risk of injury or death.

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Protocol 4: Spine Injuries

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

1. Assess the mechanism. If a positive or uncertain mechanism exists, protect the spine from further trauma by whatever method is feasible and available.
2. Do a thorough evaluation including a history and physical examination. To clear the spine, the patient must meet all of the following criteria:
 - a) Patient must be reliable, cooperative, sober, and alert.
 - 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 the spine cannot be cleared, spine injury remains on the problem list and must be appropriately managed and followed up as part of patient care and evacuation. This may include stabilization and carry, assisted self extrication, or other means of reducing the risk of further injury pending medical evaluation and treatment.

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Protocol 5: Joint Dislocations

This protocol specifically applies to the reduction of dislocations of the shoulder, patella, and digits. These injuries are usually isolated, not accompanied by significant critical system injury, and caused by an indirect mechanism. All other dislocations should be treated as unstable joint injury and splinted in a position that maintains stability and neurovascular function while facilitating transport.

SHOULDER

Any manipulative technique that is performed slowly and gently on an awake and cooperative patient is generally safe. For the purposes of this protocol the Cunningham, External Rotation, Baseball, Hanging, and Scapular Manipulation are described. These techniques can be used in sequence or in combination as needed to achieve a successful reduction. Discontinue the procedure if pain significantly increases and/or if physical resistance is encountered.

Neurovascular status is documented before and after reduction. Non-emergent medical evaluation is advised but may be delayed by up to 10 days if distal circulation and sensation has returned to normal.

Cunningham: This technique encourages muscle relaxation which may allow the humeral head to return to normal position without additional manipulation. The patient is positioned sitting upright with the shoulders back and chest out facing the practitioner. The patient's arm remains adducted (against the body) while the hand is placed on the practitioner's shoulder (right dislocation, right hand on practitioner's right shoulder). The practitioner massages the trapezius, deltoid, and biceps muscles until reduction is achieved.

External Rotation: This is essentially the same as the Cunningham technique with the addition of manipulation. The practitioner gently applies external rotation of the patient's arm with the elbow remaining adducted against the chest.

Baseball Position: 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.

Hanging Traction: Have the patient lie face down 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.

Scapular Manipulation: (This procedure may require 2 rescuers) – Have the patient either lie face down (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. This technique is often an effective adjunct to the other techniques described.

Note: If the patient cannot adduct the arm against the chest, techniques such as the baseball position, hanging traction, and scapular manipulation are more likely to be successful.

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. Stabilize the patella with tape or an elastic wrap.
4. Reassess and document distal neurovascular status.
5. Arrange for non-emergent medical evaluation. Patients may walk out if pain is tolerable.

DIGITS (FINGERS AND TOES, INCLUDING THUMB)

1. Check and document distal neurovascular function.
2. Apply axial traction distal and counter-traction proximal to the dislocated joint until the dislocation has been reduced. Discontinue the procedure if pain significantly increases and/or if physical resistance is encountered.
3. Splint in the anatomical position.
4. Reassess and document distal neurovascular status.
5. Arrange for non-emergent medical evaluation.

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Medical Advisor

Protocol 6: Severe Asthma

This protocol outlines the treatment of an asthma attack causing persistent respiratory distress not responding to the patient's use of a rescue inhaler. This is a high-risk problem that can cause respiratory failure and death from respiratory arrest. Early recognition and prompt treatment is essential.

1. Inject 0.01 mg/kilogram (up to 0.5 mg) of 1 mg/ml solution of epinephrine intramuscularly (IM) into the lateral mid-thigh. A dose of 0.3 to 0.5 mg is appropriate for the average adult.
2. Maintain an open airway and position of comfort. Initiate either positive pressure ventilations (PPV) or cardiopulmonary resuscitation (CPR) as indicated.
3. Repeat epinephrine injections as soon as every 5 minutes if needed.
4. Prednisone 60 mg/day for an average adult.
5. Have the patient self-administer 6-10 puffs from the MDI/HFA. This may be repeated every 20 minutes for a total of three doses.
6. Evacuate to hospital care if safe to do so. Consider an advanced life support intercept en route (ALS).
7. If evacuation is not possible, monitor carefully and repeat treatment per protocol as necessary.

Note: The preferred concentration of epinephrine for IM injection is 1 mg/1 ml. Although the lateral mid-thigh is preferred, an injection into the deltoid may be the only practical option.

Commercially available auto-injectors such as the EpiPen deliver either 0.3 mg or 0.5 mg as a standard adult dose or a 0.15 mg or 0.1 mg for a smaller person (less than 55 lbs; 25 kg), depending on body mass. The auto-injector is the most user-friendly device, but also the most expensive. Epinephrine is also supplied in 1 ml ampules, and vials of various sizes, for a fraction of the cost. WMAI graduates at the WALs, WEMT, and WFR level are trained in the use of syringes, needles, vials, and ampules for this purpose.

For patients weighing less than 55 lbs (25kg), the doses are: epinephrine 0.01 mg/kg or the appropriate auto-injector and prednisone 1 mg/kg. Multiply the weight in pounds times 0.45 to get the weight in kilograms.

The organization may need a prescription from a medical advisor to obtain the injectable epinephrine, syringes and prednisone used in the protocol. It is essential for prescribers and organizations to be familiar with state, provincial or national regulations that may address the prescribing of medication and the acceptable means of injecting epinephrine.

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

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