B. AIRWAY MANAGEMENT: LARYNGEAL MASK AIRWAY WITH DESIGN TO FACILITATE HOSPITAL ENDOTRACHEAL INTUBATION

1. PURPOSE

To provide an alternative means of ventilating patients who cannot be intubated via direct laryngoscopy with a laryngeal mask airway device that also facilitates hospital placement of an endotracheal tube.

2. INDICATIONS

Inability to place an endotracheal tube in a patient who has no gag reflex (including patients who cannot be intubated following the administration of succinylcholine)

3. CONTRAINDICATIONS

a) Responsive patients with an intact gag reflex
b) Lack of an appropriately-sized device

4. POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

a) The laryngeal mask airway provides limited protection against the effects of regurgitation and aspiration.
b) High airway pressures may divert gas to the atmosphere.

5. PROCEDURE

a) Inspect all components of the laryngeal mask airway for damage.
b) Select appropriately-sized laryngeal mask airway as per manufacturer specifications.
c) Lubricate with water soluble jelly.
d) Maintain cervical immobilization (if indicated) and lift tongue.
e) Insert laryngeal mask airway to indicated depth.
f) Inflate cuff as per manufacturer specifications.
g) Ventilate and evaluate lung ventilation (breath sounds, absence of gastric sounds, chest rise, $ETCO_2$, oxygen saturation).
h) Adjust cuff inflation and position as needed to obtain a seal of the airway.
i) Once effective ventilation is confirmed, continue to monitor oxygen saturation and ventilate to desired $ETCO_2$ level.
j) If unable to achieve adequate ventilation using the laryngeal mask airway, remove device, reinitiate BVM ventilation, and then attempt again. If unable to ventilate, consider obstructed airway maneuvers (if not yet performed) and refer to Cricothyroidotomy Protocol.

BB. WILDERNESS EMS

A. INTRODUCTION

These protocols are complementary to *The Maryland Medical Protocols for Emergency Medical Services*. They are to be utilized only under the following conditions:

1. The protocols are being utilized in a defined wilderness environment.
2. The EMS jurisdiction has been authorized to utilize wilderness EMS protocols.
3. The EMS clinician has been credentialed as a wilderness EMS clinician (see B.1.b).
4. The EMS clinician is functioning under appropriate wilderness EMS medical direction.

B. DEFINITIONS

1. Wilderness Environment
   a) A wilderness environment is defined as "any geographic area where the typical urban resources are not adequate for the management of an injured or sick patient." Some examples include woodland areas, mountainous terrain, uneven terrain where traditional urban EMS equipment and stretchers are not able to safely function, rivers, and ski hills.
   b) In order to be considered a Wilderness EMS (WEMS) clinician, the clinician needs to have completed additional training beyond that required to function in the urban environment. This training can be completed by any of the following methods:
      (1) Completion of the State of Maryland Wilderness EMS Course
      (2) Alternatively, the clinician may demonstrate proficiency in the skills of wilderness EMS after providing proof of completion of a nationally recognized wilderness EMS program. Five programs that are nationally recognized are:
         (a) National Outdoor Leadership School's Wilderness Medical Institute
         (b) National Ski Patrol's Outdoor Emergency Care program
         (c) Stonehearth Open Learning Opportunities
         (d) Wilderness Medical Associates
         (e) (e) American Health Safety Institute
      (3) Basic Life Support (BLS) clinicians include both the EMTs and WEMRs who meet these credentialing processes
2. Wilderness EMS Physician
   a) In order to be considered a wilderness EMS physician, the physician needs to have fulfilled the requirements in order to function as a medical director under COMAR 30.03.03 and be recognized by the State EMS Medical Director as being qualified to provide medical direction in the wilderness environment. Expertise in wilderness EMS may be demonstrated by:
      (1) Completion of a recognized program in wilderness medicine
      (2) At least 2 years of experience functioning in the wilderness environment under the defined capacity of a wilderness medical practitioner
3. Wilderness EMS Jurisdiction
   a) In order to be recognized as a wilderness EMS jurisdiction the following parameters must be met:
      (1) A written request with a demonstrated need
      (2) EMS clinicians credentialed as Wilderness Clinicians
      (3) The clinicians are functioning under a state recognized wilderness EMS medical director

b) As there is limited utility for a ground ambulance in the wilderness environment, the wilderness EMS jurisdiction need not be required to have a primary transport vehicle in order to be recognized as a wilderness EMS jurisdiction. However, since the patient will likely eventually need transport to definitive care by ground and/or air ambulance, the wilderness EMS jurisdiction needs to have a plan for transportation once the patient(s) is out of the wilderness environment. Thus, there must be readily available and functioning communication methods between the wilderness EMS jurisdiction and the local EMS jurisdiction. Further, in order to facilitate timely and appropriate post-wilderness care, if the WEMS program is not a section of a previously established public safety EMS transporting jurisdiction, the wilderness EMS jurisdiction must notify the jurisdiction that will be responsible for ground or air transport as soon as the need for transport has been confirmed. Ideally this communication should occur through direct communication with the transporting jurisdiction's emergency communication center rather than simply dialing 9-1-1.

C. SCOPE OF PRACTICE

1. Provision of medical care in the wilderness environment is unique in that delays of care due to the remoteness of the environment may be detrimental to the patient. In order to address the unique needs and specialized skills required to manage a patient in the wilderness, these protocols and the training required to utilize these protocols will serve to define the scope of practice of the WEMS clinician. Therefore, THE TERM CLINICIAN IS GENERIC AND DOES NOT IMPLY A SPECIFIC LEVEL OF MEDICAL TRAINING. THE WILDERNESS CLINICIAN MAY BE TRAINED TO ANY LEVEL AND COULD BE A PHYSICIAN, PARAMEDIC, CARDIAC RESCUE TECHNICIAN, EMT, OR WILDERNESS EMERGENCY MEDICAL RESPONDER.
2. In order for the EMS clinician to use these wilderness EMS protocols there must be a need demonstrated in which it is documented that without these protocols:
   a) It would not be possible to safely extricate the patient from the environment or
   b) There is a high risk of the patient or other public safety personnel incurring permanent disability or death without the use of the WEMS Protocols

D. TRANSFER OF CARE

1. Care is transferred from the WEMS clinician to the transporting EMS clinician at the point at which the patient is either:
   a) No longer in the wilderness environment, or
   b) The wilderness EMS clinician has formally transferred care to the transporting clinician.
2. There may be times in which the WEMS clinician's expertise is needed after transfer of care to the transporting jurisdiction. If this is the case:
   a) The highest trained WEMS clinician shall ride to the hospital with the patient.
   b) Conflicts shall be resolved by contacting the medical director for the WEMS jurisdiction and then the local EMS Base Station medical control.

E. DOCUMENTATION/QUALITY IMPROVEMENT

1. At the completion of the rescue, the WEMS clinicians must fill out a patient chart in compliance with the MIEMSS charting system.
2. A brief written report shall be provided to the transporting agency with the following information:
   a) Patient name, age, gender
   b) Pertinent history of the case
   c) Vital signs and other pertinent physical findings
   d) Care rendered
3. WEMS clinicians must demonstrate proficiency to the WEMS Medical Director on an annual basis via skills testing and/or documentation of the utilization of skills in the field. This may be demonstrated through regular field training exercises.
4. Review of each call:
   a) Upon completion of the WEMS event, notification of the utilization of the WEMS Protocols will be made to the appropriate EMS supervisor.
   b) The WEMS Medical Director will review 100% of WEMS calls as soon as is reasonably possible. Ideally this should be done within 48 hours of the event.
   c) The WEMS program will maintain a detailed WEMS database and will provide an annual report to the State EMS Medical Director.

TREATMENT PROTOCOLS

The wilderness EMS clinician shall have responsibilities for part or all of these protocols, summarized as follows, based on BLS or ALS level of certification/licensure:

Intervention	BLS	ALS
Provision of access to medications: Ibuprofen, Acetaminophen, Oral electrolytes, Calcium Carbonate tablets (e.g. Tums), ranitidine, diphenhydramine, epinephrine, aspirin, albuterol, ondansetron ODT	•	•
Administration of medications in Protocol, not listed above		•
Hemorrhage control with hemostatic agent and tourniquet	•	•
King Airway	•	•
Surgical Cricothyroidotomy		• (Paramedic only)
Wound closure with steri-strips or other tissue tape	•	•
Wound closure with tissue adhesive		•
Pelvic Binder	•	•

A. Airway

1. Initiate general patient care as per *The Maryland Medical Protocols for Emergency Medical Services*.
2. Assess the patient's airway and determine if the patient's airway is patent, intact, or compromised.
3. If the airway is compromised, establish a patent airway using one of the following techniques:
   a) Insert an oral-pharyngeal airway or naso-pharyngeal airway.
   b) Tack the patient's tongue to the patient's lip using a safety pin.
   c) Insert a KING airway per protocol.

ALS SKILL (PARAMEDIC ONLY)

   d) If unable to insert a KING airway and unable to keep the airway open with a non-invasive technique, then proceed to a surgical cricothyroidotomy.

B. Cardiac Arrest
   1. Initiate general patient care as per *The Maryland Medical Protocols for Emergency Medical Services*.
   2. Perform CPR.
   3. If equipped with AED, utilize as appropriate.
   4. Continue CPR and utilization of AED per protocol until there is Return of Spontaneous Circulation (ROSC).
   5. If an AED is present, the resuscitation may be terminated per the TOR Protocol. TOR conditions requiring physician consult are waived, such that clinicians may terminate without consult.
   6. If an AED is not present, the resuscitation may be terminated if there is no ROSC after 30 minutes of resuscitative efforts.
   7. Resuscitation may also be terminated if rescuers are exhausted or in danger.

C. Asthma
   1. Initiate general patient care as per *The Maryland Medical Protocols for Emergency Medical Services*.
   2. Administer albuterol MDI – 2 puffs every hour as needed; may administer up to 4 puffs per hour.
   3. Consider administration of epinephrine (manual or auto-injector) for severe asthma.
   4. Pediatrics less than 30 kg estimated weight administer 0.15 mg IM
   5. Pediatrics greater than 30 kg estimated weight and adults administer 0.5 mg IM

ALS SKILL

   6. Consider administration of dexamethasone
      (a) Pediatrics – 0.5 mg/kg to max of 10 mg every 24 hours
      (b) Adults – 10 mg every 24 hours

All Clinicians

   7. Continue treatment and monitoring of patient.
   8. Transport to definitive care.

D. Acute coronary syndrome
   1. Initiate general patient care as per *The Maryland Medical Protocols for Emergency Medical Services*.
   2. Acute coronary syndrome may be difficult to diagnose in the wilderness environ-

ment without the use of a 12-lead EKG. WEMS clinicians should have a high index of suspicion in a patient complaining of chest pain, shortness of breath, or extreme fatigue without an alternate explanation for these symptoms.
3. Closely monitor vital signs during patient contact.
4. Provide oxygen if available at 2 liters per nasal cannula or as needed to treat symptoms or keep oxygen saturation above 90% if a pulse oximetry is available.
5. Administer aspirin 324 mg (81 mg low-dose aspirin X 4) or 325 mg aspirin chewed
6. Expedite transport out of the wilderness.

E. Shock
1. Patients presenting with shock will exhibit signs of poor perfusion to critical organs.
2. The patient may or may not be hypotensive.
3. The most common reason for shock in trauma is hemorrhage.
4. Treat the underlying cause. Control external bleeding.
5. Control for environmental conditions.

ALS SKILL
6. If carrying IV/IO fluids, establish IV access and administer parenteral fluids with Lactated Ringer's (LR).
7. Pediatrics 20 mL/kg bolus to maintain a radial pulse and to maintain normal mentation
8. Adults 500–1,000 mL bolus to maintain a radial pulse and to maintain normal mentation
9. Continue fluids to maintain peripheral perfusion.

ALL CLINICIANS
10. Expedite transport.

F. External Bleeding
1. Initiate general patient care as per *The Maryland Medical Protocols for Emergency Medical Services*.
2. Control external bleeding with direct pressure.
3. If unable to control extremity bleeding with direct pressure, apply tourniquet proximally to the site of bleeding. Note the time and date of the tourniquet application. If time of delivery of patient to definitive care is expected to exceed 12 hours, then it is appropriate to release the tourniquet every 2 hours. However if tourniquet is released, closely observe area for bleeding and immediately reapply if bleeding resumes.
4. If unable to control bleeding in site other than extremity, or if unable to get control of bleeding with a tourniquet, then apply hemostatic impregnated gauze or hemostatic agent (HemCon® or similar product) per manufacturer instructions.

G. Wound Care
1. Initiate general patient care as per *The Maryland Medical Protocols for Emergency Medical Services*.
2. Once bleeding has been controlled, assess the size and depth of the wound. Assess for extent of contamination. In addition, assess for any suspicion of

underlying broken bones or dislocated joints in association with the wound.

3. Irrigate the wound. Ideally the wound should be irrigated with high pressure. High pressure irrigation devices can be created with a syringe or a plastic bag with a small hole. Irrigate with water that is clean enough to drink. Irrigate until all visible foreign bodies have been removed.
4. Assess need for primary closure of wound.
   a) In the wilderness setting, large wounds may warrant primary closure if time to definitive treatment is greater than 4 hours.
   b) Primary closure can be achieved with:
      (1) Steri-strips or other tape (duct tape works well)

ALS SKILL

      (2) Tissue adhesive (Dermabond® or similar product)
      (3) Staples (Physician only skill)
      (4) Sutures (Physician only skill)
   c) Wounds that persist with foreign bodies despite adequate irrigation should not be primarily closed.
   d) Unless there will be a significant delay of transport of patient to definitive care (i.e., greater than 12 hours) do not primarily close facial wounds in the wilderness environment.
5. Assess need for administration of antibiotics
   a) Wounds that warrant antibiotic prophylaxis include:
      (1) Grossly contaminated wounds
      (2) Wounds with obvious involvement of broken bones or joint spaces
      (3) Wounds with involvement of tendons or ligaments
      (4) Mammalian bites
   b) Antibiotic that may be used include:
      (1) Amoxicillin-clavulanate (Augmentin®) – 10 mg/kg or 500 mg of the amoxicillin component every 8 hours
      (2) Cephalexin (Keflex®) – 10 mg/kg or 500 mg every 6 hours
      (3) Bactrim® 5 mg/kg every 12 hours or 1 DS every 12 hours
      (4) Clindamycin 10 mg/kg every 8 hours or 300 mg every 8 hours

ALL CLINICIANS

6. Cover wound with bacitracin antibiotic ointment.
7. Cover wound with sterile gauze and gauze wrap.

H. Altered mental status
   1. The differential of altered mental status is quite broad, including:
      a) Traumatic brain injury
      b) Stroke
      c) Infection
      d) Acute coronary syndrome
      e) Intoxication
      f) Hypoglycemia
   2. If there is any possibility of trauma, protect the patient's cervical spine.
   3. If unable to check glucose with a glucometer, assume that the patient is hypoglycemic and treat accordingly.
      a) Gently rub glucose paste on the inside of the patient's cheek, 10–15 grams.

ALS SKILL

b) If carrying glucagon, administer 1 mg IM (0.5 mg if less than 25 kg).
c) If carrying IV medications, administer dextrose.
d) 1 amp D50 IV for adults
e) 1–2 mL/kg D50 for children greater than 2 years old
f) 2–4 mL/kg D25 for children less than 2 years old

ALL CLINICIANS

4. Transport out of the wilderness.

I. Traumatic Brain Injury
   1. Initiate general patient care as per the MIEMSS protocols.
   2. Any patient with a blow to the head and the following findings should prompt the WEMS clinician to initiate rapid transportation to a trauma center:
      a) GCS less than 13 or a motor score less than 6
      b) Rapidly declining GCS
      c) Debilitating headache
      d) Profuse vomiting
      e) Raccoon's eyes
      f) Battle's signs
      g) Seizures
   3. Control the cervical spine and airway as needed.
   4. In a patient with a blow to the head, no loss of consciousness, but at least a brief period of confusion or loss of memory, closely observe and extricate from the wilderness environment. Watch for deterioration of mental status. The patient should be cleared by a physician prior to resuming activities at risk for head injury.

J. Back Injury/Spinal Cord Injury
   1. Extrication of a fully immobilized patient from the wilderness environment can be quite difficult and pose increased risks to both the patient and rescuers. Therefore, despite a significant mechanism of injury, patients who have concern for spinal column injury and/or meet criteria for the Spinal Protection Protocol should be allowed to ambulate on their own volition as long as the patient is alert, reliable, and has no major neurological deficits.
   2. Patients who have evidence of neurological deficit and/or those who are not able to safely ambulate on their own volition shall be secured in an extrication device in a manner that conforms, as much as possible, to the normal contours of the spine and minimizes, as much as possible, movement of the spinal column.
   3. Any patient who has been secured in an extrication device should have placement of a diaper for control of urine, especially if the transport time to definitive care is expected to be greater than one hour.

K . Diagnosis of fractures in the wilderness will be based on clinical findings rather than radiologic studies.
   1. Things to assess when considering if a patient has a possible fracture requiring immobilization are:

a) Ability of the patient to bear weight or use the affected limb
b) Evidence of angulations, deformities, crepitus, bruising
c) Did the patient hear a breaking sound or feel the bone breaking?

2. Assess distal neurological as well as vascular function.
3. If the patient does NOT have intact distal pulses, then manually reduce by bringing the affected area back to a near anatomic alignment.
4. The general principle of splinting is to immobilize the joint above and below the site of suspected fracture. Provide adequate padding. Splints may be commercially designed or improvised. Assess pulses before and after splinting. Perform frequent vascular checks during transportation.
5. Consider placing a diaper on the patient to catch urine—especially for fractures of the lower extremities that will prevent the patient from being able to urinate unaided.
6. Specific splinting guidelines are as follows:
   a) Shoulder and upper arm
      (1) Immobilize as needed for comfort.
      (2) Place in a sling and swath.
   b) Lower arm
      (1) Immobilize, including the wrist and elbow.
      (2) Place in sling and swath.
   c) Hand
      (1) Realign misangulated digits as needed.
      (2) Place a soft roll of gauze in the hand.
      (3) Wrap with a bandage.
   d) Hip
      (1) Immobilize both upper legs together, placing padding between the legs.
      (2) Place on a stretcher.
      (3) Carry out.
      (4) Do not place patient in traction.
   e) Pelvis
      (1) Assess for injury to vagina or penis.
      (2) Pelvic fracture is noted by instability of the pelvis.
      (3) Immobilize with commercially available pelvic binder or improvised pelvic binder.
      (4) Expedite transport to a trauma center.
   f) Femur
      (1) Immobilization of femur fractures with traction splints is no more effective than immobilization to the unaffected leg and transport on a stretcher. In the WEMS setting, the clinician should use judgment and either use a traction split or immobilize the injured leg to the unaffected leg.
      (2) Immobilize the fractured leg to the uninjured leg with adequate padding or use a traction splint.
      (3) Place padding behind the knees.
      (4) Carry the patient out on a stretcher.
   g) Knee
      (1) Patellar fractures typically occur due to a direct blow to the patella.
      (2) The patient is likely to have significant pain and not want to fully extend the knee.

(3) Immobilize with a circumferential splint ensuring that the popliteal artery behind the knee is not compromised.
(4) The patient may be able to ambulate out on own with a crutch and assistance.

L. Dislocations
1. Considerations for reducing a dislocated joint in the wilderness:
a) Reductions are typically easier immediately after an injury, before the joint has become swollen and muscles are in spasm.
b) Extrication of a patient from the wilderness with a dislocated joint can be quite difficult, presenting increased risks to the patient and the rescuers.
c) Dislocated joints can result in compromise to vascular and/or neurological structures.
2. Always check neurological and vascular integrity before and after an attempted reduction.
3. Consider placing a diaper on the patient for control of urine—especially for dislocations of the lower extremities that may prevent the patient from being able to urinate unaided.
4. Specific reductions are as follows:
a) Shoulder
(1) The greater majority of shoulder dislocations are anterior. Mechanism is typically external rotation and abduction. The patient will complain of pain in the shoulder and will be resistant to bringing the arm into a position of rest across the body.
(2) Check for motor and vascular integrity in the hand.
(3) Also check for sensation in the outer aspect of the shoulder.
(4) Reduction technique
External Rotation
(a) Lie the patient supine on a flat surface.
(b) Secure the patient's affected arm adducted to the patient's side.
(c) The elbow should be flexed to 90 degrees.
(d) Hold the patient's wrist and gently guide the arm into a slow external rotation while holding the upper arm fixed to the patient's side.
(e) Whenever the patient experiences pain, halt the procedure momentarily then continue.
(f) Continue guiding the forearm until it is lying perpendicular to the patient's side on the flat surface.
(5) Place the patient in a sling and swath.
b) Fingers
(1) Clinically diagnosed by obvious deformity and loss of function
(2) Reduction technique
(a) Maintain digit in partial flexion.
(b) Apply traction to the flexed digit while pushing the base of the phalanx back into place.
(3) Splint the fingers in an anatomic position with a roller gauze splint.
c) Hip
(1) Hip dislocations tend to be posterior. The patient's hip will be internally ro-

tated and adducted. You may also notice the affected limb to appear shorter than the other limb.

(2) If equipped with ALS medications, pretreat with midazolam 5 mg IM. Alternatively pre-medicate with an oral analgesic.

(3) Reduction technique

(a) The patient should be lying supine flat on the ground.

(b) Flex the hip and knee to 90 degrees.

(c) Straddle the patient and apply traction in an upward direction while another clinician is providing counter traction by holding the pelvis fixed to the ground.

(4) Once reduced, the hip should be immobilized to the uninjured leg and the patient carried out on a stretcher.

d) Knee

(1) Knee dislocations carry great risk of injury to the popliteal artery behind the knee.

(2) Assess for pulses in the foot.

(3) Reduction technique

Gently exaggerate the injury and then apply gentle traction to bring the joint to anatomic position.

(4) Splint the knee slightly flexed and carry the patient out.

(5) Expedite transport to a trauma center.

e) Patella

(1) The patella will typically displace laterally with the knee held flexed by the patient for comfort.

(2) Reduction technique

(a) Gently extend the knee so that the lower leg is straight to the upper leg. This movement may result in the reduction of the dislocated patella.

(b) If the patella remains dislocated after extension of the knee, then apply gentle pressure on the lateral edge of the patella pushing the patella back into its anatomic location. Do not force the patella if it is not easily reducible.

(3) Splint the leg in extension.

(4) The patient may be able to ambulate with a crutch and assistance.

f) Ankle

(1) Ankle dislocations are typically associated with fractures.

(2) There will be obvious deformity.

(3) There may be compromise of vascular structures.

(4) Reduction technique

Apply gentle traction to place the ankle back into its anatomic location.

(5) The ankle will likely remain unstable after reduction and may easily dislocate without splinting. Therefore, be prepared to splint the ankle immediately after reduction. Have one clinician maintain the reduction, while another clinician applies a splint.

(6) Carry the patient out of the wilderness.

M. Ankle sprain
   1. An ankle sprain typically is described by the patient as twisting of the ankle after walking or tripping over a ledge. The patient will often be able to ambulate on the ankle with assistance. There should be no instability to the ankle.
   2. Management
      a) Support the ankle with an ACE wrap or other supportive device.
      b) Provide a walking aid for the patient such as a crutch or walking stick.
      c) Assist the patient in ambulating out of the wilderness.

N. Foot Care – Blister management
   1. Blisters typically develop from a hiker wearing a shoe that has not been broken in and/or is not fitted properly. Wearing two pairs of socks often helps to prevent blisters.
   2. Management
      a) Cover the blister with mole-skin or mole foam.
      b) In most cases you should NOT open the blister, as this increases the risk of infection.
         c) You may open the blister with a scalpel or clean knife if the location of the blister is impeding the ability for the patient to self-extricate from the wilderness. Cut in the lines of the skin, drain the fluid, and then cover with antibiotic ointment and a sterile dressing.
      d) Assist the patient in ambulating out of the wilderness.

O. Eye
   1. Non-painful acute loss of vision
      a) Patients with acute non-painful loss of vision may have occlusion of the artery to the eye or vasculitis of the artery.
      b) If available, administer oxygen at high flow.

ALS SKILL

      c) Administer aspirin 325 mg po (adults only).

ALL CLINICIANS

      d) Expedite transport to the ophthalmology referral center.
   2. Globe rupture
      a) Rupture of the eye globe may be obvious or occult.
      b) Obvious globe rupture will be diagnosed by bleeding from the orbit and irregularly shaped orbit and/or pupil that is not reactive to light.
      c) Cover the affected eye with eye dressing, being careful not to put pressure on the globe, and expedite transport to the ophthalmology referral center.
   3. Red Eye
      a) Differential diagnosis of red eye includes:
         (1) Foreign body
         (2) Infection—either bacterial or viral
         (3) Allergic reaction
         (4) Globe rupture
         (5) Acute angle closure glaucoma
      b) Cover eye and expedite transport to ophthalmology referral center.

4. Foreign body in eye
    a) If the clinician is sure that the patient's discomfort is due to a foreign body, the clinician may attempt to remove the foreign body.

ALS SKILL

    b) Numb the eye with 2 drops tetracaine 0.5% ophthalmic solution (peds and adults).

ALL CLINICIANS

    c) Evert the eyelid.
    d) Remove any foreign particles with a moist cotton applicator or equivalent.
    e) DO NOT FORCEFULLY REMOVE PARTICLES STUCK TO THE EYE.
    f) Irrigate the eye with water clean enough to drink.

P. Nose - Epistaxis
1. Control bleeding by pinching nose until bleeding stops.
2. If unable to control bleeding, pack.

ALS SKILL

3. If you anticipate the packing to be in for greater than 24 hours, initiate antibiotic prophylaxis with either Augmentin® or Bactrim®.

ALL CLINICIANS

4. Transport out of wilderness.

Q. Teeth
1. Fractured tooth
    a) A fractured tooth that is bleeding is a dental emergency.
    b) The exposed nerve roots will typically be quite painful.
    c) Place a small piece of aspirin on the top of the exposed nerve roots. This will initially be painful to the patient, but the pain should quickly decrease and then be followed by significant relief of pain. You can also cover the exposed nerve roots with sugarless gum or wax.
    d) Have patient cover tooth with gauze.
    e) Transport out of wilderness.
2. Tooth avulsion
    a) Pick the tooth up by the top rather than the root.
    b) Irrigate tooth and socket gently with water clean enough to drink.
    c) DO NOT SCRUB THE TOOTH.
    d) Replace tooth in socket and have patient maintain tooth by keeping mouth closed as much as possible. You may fix the tooth in place with a piece of sugarless gum.
    e) Alternatively place tooth inside of cheek ensuring that the patient does not aspirate or swallow the tooth.
    f) If traveling in difficult terrain, it is acceptable to place tooth in container with clear liquid.

R. Burns
1. Clean burns with water clean enough to drink and gentle scrubbing as needed to remove debris.

2. If you expect to get the patient to a burn center within 24 hours, do not cover with antibiotic ointment. If transport to a burn center is expected to exceed 24 hours, then cover with antibiotic ointment.
3. Cover burn with sterile dressing.

ALS SKILL

4. Treat pain
   a) Ibuprofen 600 mg po every 6 hours; 10 mg/kg
   b) Acetaminophen 3–5 yrs old 160 mg/5mL; 6–9 yrs old 320 mg/10mL; greater than 9 yrs old 640 mg/20mL or 650 mg po tab. May repeat dose every 6 hours as needed.
   c) Oxycodone 5–10 mg every 6 hours as needed
   d) For pediatrics administer 0.1 mg/kg of oxycodone every 6 hours as needed.
   e) Morphine 0.1 mg/kg IV/IM to max dose 20 mg with repeat dose of 0.05 mg/kg to max dose of 10 mg every 1 hour as needed
   f) Administer fentanyl 1 **mcg**/kg IN/IV/IM to a max dose of 200 **mcg** with a repeat dose of 1 **mcg**/kg to a max dose of 200 **mcg** every 1 hour as needed.

ALL CLINICIANS

5. Transport to burn center if meeting burn center criteria (see Burn Protocol in MIEMSS treatment protocols).

S. Anaphylaxis

1. Severe allergic reactions present with diffuse hives, airway swelling, and signs of hypoperfusion.
2. Goals of treatment are to counteract the effects on the airway, respiratory system, and cardiovascular system.
3. Specific treatment
   a) Epinephrine (manual or auto-injector)
      (1) Less than 30 kg estimated weight, administer 0.15 mg IM
      (2) Greater than 30 kg estimated weight and adults, administer 0.5 mg IM
   b) Albuterol MDI 2 puffs may repeat every 5 minutes as needed

ALS SKILL

   c) Benadryl®: Pediatric 1 mg/kg every 6 hours; Adults 25–50 mg every 8 hours
   d) Dexamethasone: Pediatric 0.5 mg/kg; Adults 10 mg po

ALL CLINICIANS

4. Expedite transport out of the wilderness.

T. Hypothermia

1. Hypothermia occurs when the body's ability to conserve and generate heat is not able to compensate for loss of heat.
2. The conditions that are most favorable for development of hypothermia mirror the most efficient methods for losing heat—wet and windy conditions. Therefore, temperatures just above freezing are often more favorable for the development of hypothermia than temperatures below freezing.
3. The beginning stages of hypothermia are clinically evident when a patient is cold and shivering. During this stage the patient will be able to re-warm themselves with passive warming techniques.
   a) Remove the patient from the wet and windy conditions.

b) Remove any wet clothes.
c) Place the patient in sleeping bags or cover the patient with blankets (foil safety blankets work well). Another option is to place the patient's body into garbage bags, ensuring that the head is not covered with the bag.

4. The point at which the patient is no longer shivering marks the beginning of severe hypothermia. If the patient is not shivering, the patient will not be able to self-generate heat. Also during this stage the patient may develop confusion and other neurological findings. Treatment will need to be active replacement of heat. Follow the steps in #3 above. In addition, add heat to the patient. Possible methods for adding heat include:
   a) Have another person join the patient in a sleeping bag or under blankets.
   b) Pack the patient's axilla and groin with warm packs or water bottles filled with warm liquids.
5. Profound hypothermia is marked by cardiac instability progressing to arrhythmias—ventricular fibrillation, severe bradycardias, and asystole. Handle the patient carefully so as to not induce ventricular fibrillation, but nevertheless remove the patient from the environment. If suspicious of cardiac arrest, check for a pulse for at least 30 seconds. If the patient is in cardiac arrest, attempt to warm the patient while performing CPR. Continue CPR until the patient is warm, he or she is transferred to the transporting EMS agency, or the rescuers are fatigued.
6. If the patient is alert and there is no concern for airway compromise, feed the patient per the nutrition guidelines. The treatment of hypothermia is aided by the patient having fuel to self-generate heat.

U. Frostbite
1. Frostbite is a localized tissue injury from freezing of tissue. Whereas hypothermia can occur in temperatures above freezing, tissue will not freeze unless temperatures are below freezing.
2. The beginning stages of frostbite are marked by periods of intermittent pain and swelling of the affected tissue. This period is actually called "frostnip" and does not require intervention other than removing the affected tissue from the cold environment.
3. Once the tissue is frostbitten the skin will be pale, cold, and numb. Underlying tissue may be soft and pliable or firm depending on the depth of the freezing.
4. Treatment should only be initiated if the clinician is confident that there is no chance of the affected tissue refreezing. If the tissue is likely to continue to be exposed to a cold environment prior to the patient reaching definitive care, then the affected tissue should, as much as possible, be protected from the environment and covered with warm clothes and/or sterile dressing.
5. If the clinician is reasonably sure the tissue will not be further exposed to the cold, then active treatment may be initiated.
   a) Actively warm the affected tissue in warm water that has been measured with a thermometer to a temperature of 100.4–104 degrees Fahrenheit.

ALS SKILL

   b) Give ibuprofen 600 mg po every 6 hours for management of the frostbite (Peds dosing 10 mg/kg up to max of 600 mg).

c) Manage pain as needed—see pain management section HH.

ALL CLINICIANS

6. Transport the patient to definitive care.

V. Heat Exhaustion

1. Heat exhaustion is marked by intravascular volume depletion due to dehydration and excessive sweating in a hot environment.
2. Symptom include dizziness, excessive sweating, headache, confusion, nausea, and weakness.
3. Treatment
   a) Remove the patient from the hot environment and keep in the shade.
   b) Cool the patient by getting the patient wet and fanning.
   c) Replace fluids.
4. Transport out of the wilderness.

W. Heat Stroke

1. Heat stroke is a true environmental emergency marked by injury to the neurological system as a result of excessive heat.
2. The patient may or may not be sweaty.
3. Symptoms include confusion, ataxia, and tachycardia.
4. Skin will be red and hot.
5. Treatment mirrors that for heat exhaustion.
   a) Remove patient from the hot environment and keep in the shade.
   b) Cool patient with water and fanning.
   c) Place ice packs in axilla and groin; if shivering, remove the ice packs.
   d) If the patient is alert, orally replace fluids.

X. Snake Bites

1. There are two wild snakes indigenous to the State of Maryland that are poisonous:
   a) Northern Copperhead – The Northern Copperhead is identified by the coppery color to its head and the alternating tan and dark brown on its body. It likes to hide within woodpiles or under logs.
   b) Timber Rattlesnake – The Timber Rattlesnake is a large, stout-bodied snake that can grow up to 5 feet or more. It is typically identified by bands of dark chevrons on its back. Generally, the snake likes to live in wooded areas, but gravid females may be found sunning on open rocks.
2. Snake bites may or may not present with paired fang puncture wounds. A snake bite may also present with a single puncture wound or just a scratch.
3. The greater majority of bites will present with immediate onset of pain at the site of the bite. The bite will become swollen and erythematous.
4. Mark the site of erythema and monitor its progression.
5. Treatment
   a) Gently clean the area and cover with a sterile dressing.
   b) Do NOT attempt to suck out the venom with a commercial or improvised device.
   c) Do not apply a distal and proximal constricting band for poisonous snakebite to an extremity. Splint the extremity. Remove any jewelry on affected extremity.
   d) As much as possible keep the affected area below the level of the heart.
   e) Unless absolutely necessary, the patient should be carried out rather than

walked out on their own accord.
f) Calmly expedite transport out of the wilderness.

6. Do NOT try to catch the snake for identification purposes.

Y. Tick Bites

1. Tick bites in the State of Maryland are at high risk for transmission of Lyme disease and/or Rocky Mountain spotted fever.
2. In order for a tick to transmit Lyme, the tick has to be attached to the patient for at least 36 hours. Ticks found on a patient that are engorged with blood pose a much higher risk than ticks that are not engorged with blood.
3. Lyme disease presents with a circular red rash with the center clear of redness. Patients will have fevers and non-specific flu-like symptoms. The patient may also have neurological finding such as a facial droop.
4. To remove a tick, directly pull the tick up from the skin using a pair of tweezers or a tick key in a single firm steady pull.

ALS SKILL

5. If there is high suspicion for Lyme, start the patient on antibiotic treatment with doxycycline 100 mg twice a day; 2.2 mg/kg 8 years or greater. If less than 8 years old use Augmentin® 10 mg/kg every 12 hours.
6. If there is suspicion for Rocky Mountain spotted fever (the patient has fever and petechiae), then doxycycline is the antibiotic of choice for all age groups. If less than 45 kg estimated weight, administer 2.2 mg/kg every 12 hours to max dose of 100 mg. If greater than 45 kg then administer 100 mg every 12 hours.

Z. Large Animal Attacks (e.g., bear, wild cat, fox)

1. Ensure that the area is safe and that the animal is not still a threat to the patient or rescuers.
2. Patients typically die from large animal attacks secondary to injury to airway structures or hemorrhagic shock from large, gaping wounds.
3. Ensure the patient has an intact airway.
4. Control for any external bleeding.
5. Clean and dress wounds.
6. Transport out of the wilderness.
7. Do NOT attempt to capture the animal for identification purposes.

AA. Plants

1. Patients may develop localized skin reactions after contact with a plant.
   a) Remove the patient from the plant.
   b) Wash the area clean.

ALS SKILL

   c) For mild reactions, use a topical steroid. Cover the area with betamethasone valerate 0.1% ointment twice a day.
   d) For severe reactions administer dexamethasone 10 mg po; 0.5 mg/kg for pediatrics.
   e) Transport
2. Ingestion of plants and mushrooms can be life-threatening.
   a) Patients will present with nausea and vomiting.

b) Provide supportive care.
c) Transport

BB. Oral Rehydration

1. Oral rehydration with a glucose-sodium solution may be indicated in one of three conditions.
   a) Excessive sweat loss from intense exercise
   b) Mild to moderate heat illness, or severe heat illness as long as the airway is intact and the patient is able to tolerate oral fluids
   c) Dehydration from diarrhea
2. The patient will likely feel dehydrated. Mucus membranes will be dry. Skin may tent.
3. Replacement of fluids with only water and no electrolytes may lead to a dilution of intravascular sodium levels. This risks the development of cerebral edema. Therefore, fluids should be replaced with a solution of glucose and salts.
4. The ideal solution will contain 2–6% glucose and 30 mEq/Liter of sodium. Commercial sports drinks generally contain about 6% glucose and 25 mEq/Liter of sodium. While commercial sports drinks contain more than the ideal amount of glucose and less than the ideal amount of sodium, these solutions are better than just water.
5. If a glucose/sodium solution is not available, hydrate with water judiciously.
6. Replace fluids at a rate of 50–100 mL/kg over the first 4–6 hours.

CC. Nutrition

1. In rescues that are expected to be prolonged (i.e., greater than 4 hours) it may be necessary to provide nutritional support to the patient.
   a) Ensure that the patient has an intact airway and that the patient is not experiencing nausea or vomiting.
   b) Only feed the patient if you are reasonably sure that the patient will not be going to surgery in the next 12 hours.
   c) Provide nutrition with a combination of protein and carbohydrate.
      (1) Energy bars are a good choice.
      (2) A mixture of dried fruits and nuts is also a good choice.

DD. Nausea

1. Patients with traumatic injuries and/or medical illness may experience nausea. All clinicians should refer to the treatment protocols for ODT ondansetron.

ALS SKILL

2. If carrying ALS medications and IVs, follow Nausea and Vomiting Protocol in MIEMSS treatment protocols.
3. Alternatively, may administer
   a) Promethazine pediatric greater than 2 years old 0.5 mg/kg every 12 hours; adults 25 mg po every eight hours
   b) Zofran® pediatric 0.1 mg/kg; adults 4 mg IM

EE. Diarrhea

1. Diarrhea in the wilderness can result in significant dehydration to the patient.
2. Orally rehydrate the patient.

ALS SKILL

3. Administer loperamide
4. Pediatric – (loperamide is generally not indicated for pediatric populations. However, in the wilderness it may be needed to prevent profound dehydration or to facilitate extrication. Use judiciously.)
5. 2–6 years of age or 13–20 kg 1 mg po three times a day
6. 6–8 years of age or 20–30 kg 2 mg bid
7. Adults–4 mg po for the first dose then 2 mg po after each subsequent loose stool up to a total of 16 mg in a 24 hour period
8. Contraindications for loperamide are diarrhea with fevers and bloody diarrhea.

FF. Abdominal Pain

1. Non-traumatic abdominal pain may indicate a surgical emergency.
2. In women, a ruptured ectopic pregnancy is a true emergency that may present with abdominal pain.
   a) Check a female patient's urine for beta hCG using a commercial urine pregnancy test.
   b) If the patient with abdominal pain is pregnant, expedite transport.
3. In non-pregnant females and all males with abdominal pain, monitor vital signs and patient symptoms. Concerning findings suggestive of a surgical abdomen include:
   a) Instability of vital signs
   b) Progressing pain
   c) Rebound pain–pain with movement
   d) Nausea and vomiting
4. If there is high concern for surgical abdomen, do not feed the patient and expedite transport.
5. All other patients with abdominal pain should be transported so as to not miss occult surgical disease.

GG. Gastroesophageal reflux

1. Gastroesophageal reflux (GERD) (or heartburn) is typically identified by the patient complaining of a burning, substernal chest pain. The patient also may complain of having a sour taste.
2. It is important to note that the patient with symptoms of GERD may actually have an acute coronary syndrome. Therefore, as you are treating the patient's symptoms, also assess for possible acute coronary syndrome and manage appropriately. Relief of symptoms with the recommended treatment for GERD does NOT rule out the possibility of acute coronary syndrome.
3. Management of GERD
   Tums 1–2 chewed every hour as needed to a max dose of 4 tablets

HH. Pain Management

1. Treatment of pain in the wilderness may at times be necessary in order to facilitate extri-

cation and transport out of the wilderness. Therefore, treatment of pain not only benefits the patient by simply decreasing pain, treatment of pain also improves the safety of the patient and rescuers by decreasing the time spent in the wilderness.

2. Mild to moderate pain can be treated with ibuprofen and/or acetaminophen.
   a) Ibuprofen 600 mg every 6 hours orally; 10 mg/kg to max dose 600 mg for pediatric dosing
   b) acetaminophen up to 650 mg every 6 hours orally; 160 mg/5mL for 3–5 years old; 320 mg/10 mL 6–9 years old

ALS SKILL

3. Management of severe pain will often require treatment with an opiate analgesic. While intravenous opiates may have a quicker onset and more easily titratable, oral opiate analgesics tend to have less acute respiratory depression.
   a) If carrying parenteral morphine, administer 0.1 mg/kg IV/IM up to 20 mg IM. May repeat dose of 0.05 mg/kg every hour as needed.
   b) Administer fentanyl 1 **mcg**/kg IN/IV/IM to a max dose of 200 **mcg** with a repeat dose of 1 **mcg**/kg to a max dose of 200 **mcg** every 1 hour as needed.
   c) Alternatively, administer oxycodone 5–10 mg every 6 hours as needed. Pediatric dosing for oxycodone – 0.1 mg/kg every 6 hours

FORMULARY

acetaminophen (Tylenol®)

• Availability	325 mg tablet; 160 mg/5 mL
• Action	analgesic; anti-pyretic
• Indication	mild to moderate pain; fever
• Contraindication	known end stage liver disease
• Precautions	
• Side effects	
• Dose	3–5 years old 160 mg/5 mL every 6 hours as needed 6–9 years old 320 mg/10 mL every 6 hours as needed 10 years and above 640 mg/20 mL or 650 mg tab every 6 hours as needed

albuterol

• Availability	90 mcg/metered spray
• Action	bronchodilator
• Indication	shortness of breath; exacerbation of asthma/ COPD; wheezing
• Contraindication	
• Precautions	

• Side effects	
• Dose (Peds & Adult)	start with 2 puffs every four hours as needed; may use up to 4 puffs every hour

amoxicillin-clavulanate (Augmentin®)

• Availability	500 mg–125 mg tablet; 125 mg–31.5 mg/5 mL
• Action	antibiotic
• Indication	suspected respiratory infection
• Contraindication	hypersensitivity to penicillin
• Precautions	
• Side effects	diarrhea
• Dose	Pediatrics – 10 mg/kg every 12 hours Adult - 1 tablet every 8 hours

Aspirin

• Availability	325 mg; 81 mg
• Action	anti-platelet
• Indication	suspected acute coronary syndrome or stroke
• Contraindication	hypersensitivity to salicylates
• Precautions	
• Side effects	
• Dose	No pediatric dosing Adults - one 325 mg tab po qd or four 81 mg tabs po qd

bacitracin

• Availability	1 ounce (28 gram) ointment tube
• Action	topical antibiotic
• Indication	soft tissue wounds
• Contraindication	
• Precaution	
• Side effects	
• Dose (Peds and Adult)	cover the affected area 2–3 times a day

betamethasone valerate

• Availability	0.1% topical ointment
• Action	topical steroid anti-inflammatory
• Indication	contact dermatitis
• Contraindication	
• Precautions	
• Side effects	
• Dose (Peds and Adult)	apply to affected area twice a day

calcium carbonate (Tums®)

• Availability	500 mg; 750 mg chewable
• Action	neutralizes stomach acid
• Indication	upset stomach; gastroesophageal reflux
• Contraindication	
• Precautions	

• Side effects	
• Dose	Pediatric – 1 every four hours as needed Adult – 1–2 every hour as needed up to max dose of 8 tabs
cephalexin (Keflex®)	
• Availability	500 mg tablets; 125 mg/5mL
• Action	antibiotic
• Indication	suspected skin infection or prophylaxis for skin wound
• Contraindication	hypersensitivity to penicillin
• Precautions	
• Side effects	diarrhea
• Dose	Pediatric – 10 mg/kg every 6 hours Adult – 500 mg every 6 hours
chitosan (Hemcon®)	
• Availability	2"X2"; 2"X4"; 4"X4" bandages
• Action	hemostatic
• Indication	severe bleeding
• Contraindication	
• Precautions	
• Side effects	
• Dose (Peds and Adult)	apply to severe bleeding as needed
ciprofloxacin (Cipro®)	
• Availability	500 mg tablets
• Action	antibacterial
• Indication	suspected urinary tract infection; skin infection if patient is hypersensitive to penicillin
• Contraindication	hypersensitivity to floroqinolone
• Precautions	
• Side effects	
• Dose	no pediatric dosing Adult – 500 mg every 12 hours
clindamycin (Cleocin®)	
•Availability	150 or 300 mg/tablet, reconstituted liquid 75 mg/ 5 mL
•Action	antibiotic
•Indication	suspected pharyngitis or respiratory infection; cellulitis
•Contraindication	hypersensitivity to clindamycin
•Precautions	
•Side effects	diarrhea
•Dose	Pediatrics– 10mg/kg every 8 hours Adult -300mg every 8 hours
cryanoacrylate tissue adhesive (Dermabond®)	
• Availability	single use ampoules
• Action	tissue adhesive
• Indication	minor wound repair
• Contraindication	known hypersensitivity
• Precaution	avoid near eyes

• Side effects	transient local discomfort
• Dose	as required for wound closure; may need 2–4 layers

dexamethasone (Decadron®)

• Availability	1 mg/1 mL solution
• Action	Steroidal anti-inflammatory
• Indication	asthma, allergic reactions
• Contraindication	
• Precautions	
• Side effects	
• Dose	Adults 10 mg po every 24 hours as needed Pediatrics 0.5 mg/kg po every 24 hours as needed

diphenhydramamine (Benadryl®)

• Availability	25 mg tablets; 12.5 mg/5 mL
• Action	antihistamine
• Indication	allergic reactions
• Contraindication	
• Precautions	
• Side effects	sedating
• Dose	Pediatric – 1 mg/kg to max dose 50 mg every 8 hours Adult – 25–50 mg every 8 hours as needed

doxycycline (Doxy®)

• Availability	100 mg tablets; 25 mg/5 mL
• Action	antibacterial
• Indication	suspected respiratory infection with contraindication to Augmentin®
• Contraindication	
• Precautions	
• Side effects	
• Dose	8–14 years old - 2.2 mg/kg every 12 hours Adults – 100 mg every 12 hours

epinephrine auto-injector*

• Availability	0.3 mg; 0.15 mg auto-injector
• Action	antihistamine; anti-inflammatory; vasoconstrictor
• Indication	moderate to severe allergic reaction
• Contraindication	
• Precautions	
• Side effects	tachycardia; hypertension
• Dose	Pediatric less than 30 kg estimated weight – 0.15 mg IM greater than 30 kg estimated weight and adults – 0.3 mg IM

* All levels of clinicians shall be authorized to manually draw up epinephrine with a needle and syringe from an ampule or vial after education and credentialing by the wilderness jurisdictional medical director.

fentanyl

• Availability	prefilled syringe, multidose vial
• Action	opioid analgesic
• Indication	severe pain
• Contraindication	
• Precautions	
• Side effects	depressed level of consciousness; hypoxia; hypotension
• Dose	1 **mcg**/kg IN/IV/IM to a max dose of 200 **mcg** with a repeat dose of 1 **mcg**/kg to a max dose of 200 **mcg** every 1 hour as needed

glucagon

• Availability	1 mg injector
• Action	facilitates release of glucose from glycogen stores in the liver
• Indication	suspected hypoglycemia in patient that is not able to take oral glucose
• Contraindication	
• Precautions	
• Side effects	
• Dose	Pediatric less than 25 kg – 0.5 mg IM greater than 25 mg and adults – 1 mg IM

glucose gel (Glutose 15®)

• Availability	15 grams oral gel
• Action	raises blood glucose levels
• Indication	suspected hypoglycemia
• Contraindication	
• Precautions	use caution in patient with depressed level of consciousness
• Side effects	
• Dose (Peds and Adult)	give to patient by mouth in patient with depressed level of consciousness, rub the gel on the patient's gums, but use caution

hemostatic agent

All levels of clinicians are authorized to use gauze impregnated with hemostatic agent.

ibuprofen (Advil®; Motrin®)

• Availability	200 mg; 400 mg; 600 mg; 40 mg/mL
• Action	anti-inflammatory; analgesic
• Indication	mild to moderate pain
• Contraindication	hypersensitivity; known renal disease; history of GI bleeding
• Precautions	
• Side effects	

• Dose	Pediatric – 10 mg/kg to max dose 600 mg every 6 hours as needed Adult – 200 mg–600 mg every 6 hours as needed
loperamide (Imodium®)	
• Availability	2 mg tablets
• Action	anti-diarrheal
• Indication	diarrhea
• Contraindication	
• Precautions	
• Side effects	constipation
• Dose	Pediatric – 2 mg after first watery stool, then 1 mg after each subsequent watery stool; max dose 8 mg per day Adult – 4 mg after first watery stool; then administer 2 mg after each subsequent watery stool; max dose 16 mg per day
metaclopramide (Reglan®)	
• Availability	10 mg tablets; 5 mg/mL
• Action	anti-emetic
• Indication	nausea and vomiting
• Contraindication	
• Precautions	
• Side effects	
• Dose	Pediatric – 0.1 mg/kg every 8 hours as needed Adult – 10 mg every 8 hours as needed
morphine	
• Availability	4 mg carpuject
• Action	opiate analgesic
• Indication	severe pain
• Contraindication	
• Precautions	
• Side effects	depressed level of consciousness; hypoxia; hypotension
• Dose	Pediatric – 0.1 mg/kg IM every hour as needed Adult – 4 mg IM every hour as needed
ondansetron (Zofran®)	
• Availability	4 mg injectable solution
• Action	anti-emetic
• Indication	severe nausea and vomiting
• Contraindication	
• Precautions	
• Side effects	
• Dose	Pediatric – 0.1 mg/kg IM every 1 hour as needed up to max dose 16 mg per day Adult – 4 mg IM every 1 hour as needed up to max dose of

	32 mg per day
oxycodone	
• Availability	5 mg tablet
• Action	opiate analgesic
• Indication	moderate to severe pain
• Contraindication	
• Precautions	
• Side effects	depressed level of consciousness
• Dose	Pediatric – 0.05–0.15 mg/kg every 6 hours Adult – 1–2 tablets by mouth every 4 hours as needed
promethazine (Phenergan®)	
• Availability	25 mg tablets; 6.25/5 mL
• Action	anti-emetic
• Indication	mild to moderate nausea
• Contraindication	
• Precautions	
• Side effects	
• Dose	Pediatric – 0.5 mg/kg every 8 hours as needed Adult – 25 mg every 8 hours by mouth as needed
tetracaine	
• Availability	0.5% ophthalmic solution
• Action	topical anesthetic
• Indication	severe eye pain; foreign body removal from the eye
• Contraindication	hypersensitivity
• Precautions	
• Side effects	
• Dose (Peds and Adult)	2 drops to the affected eye
trimethoprim/sulfamethoxazole (Bactrim®)	
• Availability	160 mg TMP/800 mg SMX (DS tab); 40 mg/200 mg/5 mL
• Action	antibiotic
• Indication	sinus infection, upper respiratory infection, urinary tract infection
• Contraindication	hypersensitivity to sulfa
• Precautions	
• Side effects	
• Dose	Pediatric – 5 mg/kg TMP every 12 hours Adult – 1 DS tab po bid