Winter 11 Training Supplement to the

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USSOCOM MEDIC CERTIFICATION PROGRAM

Winter 2011 Supplement to the Journal of Special Operations Medicine

Introduction

This is the 5th version of the JSOM training supplement. The guidelines contained in this supplement are reviewed and compiled annually by a combined group of SOF physicians, ATPs, SOF medical personnel from all of the SOCOM component branches, and civilian medical personnel. The Tactical Medical Emergency Protocols (TMEPS) and Recommended Drug List (RDL) were created, reviewed, and approved for use by the Advanced Tactical Practitioner (ATP).

We can also send any of these products to you as a PDF file. Just request whatever you want via an email to: atp@socom.mil. Please send us CONSTRUCTIVE comments and recommendations as well. We are always looking for a good idea or a better way to ensure you have the latest greatest of information.

LTC Doug McDowell
USSOCOM Chief of Medical Education and Training

NOTES:

U.S. SPECIAL OPERATIONS COMMAND

TACTICAL TRAUMA PROTOCOLS (TTP)
TACTICAL MEDICAL EMERGENCY PROTOCOLS
RECOMMENDED DRUG LIST

For SPECIAL OPERATIONS ADVANCED TACTICAL PRACTITIONERS (ATPs)

JANUARY 10, 2011

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USSOCOM Tactical Trauma Protocols

December 2010

Basic Management Plan for Care Under Fire

1. Return fire and take cover.

2. Direct or expect casualty to remain engaged as a combatant if able.

3. Direct casualty to move to cover and apply self-aid if able.

4. Try to keep the casualty from sustaining additional wounds.

5. Stop life-threatening external hemorrhage if tactically feasible.
   a. Direct casualty to control hemorrhage by self-aid if able.
   b. For hemorrhage anatomically amenable to tourniquet application, use a CoTCCC recommended tourniquet over the uniform proximal to the bleeding site and move the casualty to cover.

Basic Management Plan for Tactical Field Care

1. Immediately remove and render safe the weapons of any casualties with altered mental status.

2. If injuries requiring urgent transport are identified, request casualty evacuation assets as soon as the tactical situation permits. Minimizing the time to surgical care is critical to survival for serious combat injuries.

3. The acronym MARCH is recommended to guide the priorities in the Care Under Fire (control of life-threatening hemorrhage only) and Tactical Field Care phases:
   a. Massive hemorrhage – control life-threatening bleeding.
   b. Airway – establish and maintain a patent airway.
   c. Respiration – decompress suspected tension pneumothorax, seal open chest wounds, and support ventilation/oxygenation as required.
   d. Circulation – establish IV/IO access and administer fluids as required to treat shock.
   e. Head injury / Hypothermia – prevent/treat hypotension and hypoxia to prevent worsening of traumatic brain injury and prevent/treat hypothermia.

4. Airway management:
   a. Conscious casualties:
      i. Allow conscious casualties with impending airway obstruction to assume any position that best protects the airway and permits self-control of secretions (including sitting up).
      ii. Chin lift or jaw thrust maneuver
      iii. Nasopharyngeal airway
   b. Unconscious casualties:
      i. Chin lift or jaw thrust maneuver
      ii. Nasopharyngeal airway
      iii. Place unconscious casualty into recovery position. Protect spine in blunt and blast trauma patients.
   c. If preceding measures are unsuccessful and airway protection is required:
      i. Normal anatomy: Consider supraglottic airway device or endotracheal intubation.
      ii. Abnormal anatomy: Surgical cricothyroidotomy (with lidocaine if conscious).
      iii. Use the definitive airway with which you are most experienced to increase likelihood of success.
   d. Failed airway: Surgical cricothyroidotomy and/or other rescue airway procedure.

e. Verify correct airway placement and patency:
   i. Confirmation with an endotracheal tube introducer (bougie).
   ii. Self-inflating bulb syringe (e.g.: Esophageal Intubation Detector).
   iii. Colorimetric end tidal CO2 detector.
   iv. End tidal CO2 monitor.
   v. Do not rely on auscultation or visual misting in the ET tube to confirm placement.
f. Do not rely on the casualty to breathe independently through the airway device. Support ventilation using a bag valve mask (BVM) device. Automatic ventilation devices are an acceptable alternative if available.

5. Breathing:
   a. Consider a tension pneumothorax in any casualty with respiratory distress or hypotension and known or suspected torso trauma.
      i. For suspected tension pneumothorax, decompress the chest on the side of the injury with a 14-gauge, 3.25 inch needle/catheter unit inserted into the second intercostal space at the mid-clavicular line.
         (a) Ensure that needle entry into the chest is not medial to the nipple line.
         (b) Ensure needle is not directed towards the heart.
         (c) Remove needle and leave catheter in place.
      ii. If unable to penetrate the anterior chest wall with the needle, consider the 4th or 5th intercostal space at the anterior axillary line on the affected side as an alternate decompression site.
      iii. Repeat decompression as required for worsening or recurring symptoms/signs.
      iv. Consider small gauge thoracostomy device or chest tube if needle decompression is unsuccessful after two attempts at each site.
   b. Treat all open and/or sucking chest wounds by immediately applying an occlusive material to cover the defect and securing it in place. Closely monitor the casualty for the potential development of a subsequent tension pneumothorax.

6. Bleeding:
   a. Assess for unrecognized hemorrhage and control all sources of bleeding. If not already done, use a CoTCCC recommended tourniquet to control life-threatening external hemorrhage in anatomically amenable sites or for any traumatic amputation.
   b. For significant external hemorrhage not amenable to tourniquet application, use an approved hemostatic agent with a pressure dressing.
   c. Reassess prior tourniquet application.
      i. If initial tourniquet is over uniform and not functioning properly, apply a second tourniquet directly to skin proximal to the original one.
      ii. Tighten tourniquet until distal pulse is absent.
      iii. Add another tourniquet proximally if one tourniquet on skin does not control bleeding.
      iv. Expose and clearly mark all tourniquet sites with the time of application using an indelible marker.
      v. If other techniques (e.g.: hemostatic or pressure dressing) are adequate to control bleeding, remove previously applied tourniquets. The goal is to remove tourniquets within 2 hours if possible.
   d. Apply pelvic binder for treatment of suspected pelvic fracture.

7. Vascular access:
   a. Start an 18-gauge IV or saline lock if indicated.
   b. If resuscitation is required and IV access is unobtainable, use the intraosseous (IO) route.

8. Fluid resuscitation:
   a. Assess for hemorrhagic shock. Altered mental status (in the absence of head injury) and weak or absent peripheral pulses are the best field indicators for shock.

b. If not in shock:
   i. No IV/IO fluids required.
   ii. PO fluids permissible if the casualty is conscious and able to swallow.
c. If in shock:
   i. Initiate IV/IO Hextend and titrate to effect.
      (a) In the absence of traumatic brain injury (TBI), use normal mental status as end point for resuscitation.
      (b) In the presence traumatic brain injury (TBI), use restoration of radial pulse or SBP > 90 mm Hg as end point for resuscitation.
   ii. Initiate resuscitation with 2 units of plasma if blood components are available. Continue resuscitation with Packed Red Blood Cells and plasma in a 1:1 ratio as required.
   iv. Fresh whole blood may be used if component therapy is not available.
   v. In the absence of blood products, use Hextend
   vi. In the absence of blood products and Hextend, use crystalloid.
d. Continued resuscitation efforts must be weighed against logistical and tactical considerations and the risk of incurring further casualties. The goal of continued resuscitation is the restoration of normal vital signs in the setting of controlled hemorrhage.

9. Head injury management:
   a. Key aspects of field management of severe TBI are the prevention of hypoxia and hypotension. Ensure early establishment of a definitive airway, aggressively treat respiratory compromise, administer oxygen if available (to maintain saturation > 95%), and fluid resuscitate hypotension.
   b. Routine hyperventilation is **NOT** recommended.
   c. Controlled hyperventilation may be considered as a temporizing measure for evidence of increasing intracranial pressure (ICP) and herniation (e.g., deteriorating mental status, unequal pupils, posturing, and irregular respiratory pattern).
      i. If end tidal CO2 monitor is available, ventilate to achieve pCO2 of 30mmHg.
      ii. If end tidal CO2 monitor is not available, ventilate at a rate of 20 per minute and a tidal volume of approximately 500ml.
   d. Hypertonic saline (3%) for evidence of increased ICP:
      i. Isolated TBI (hemodynamically stable) – administer 3% HS 500ml IV/IO.
      ii. TBI with controlled external hemorrhage - administer 3% HS 500ml IV/IO plus Hextend/other fluids as per 8c (shock) if required
   e. Seizure prophylaxis for penetrating head trauma/depressed skull fractures:
      i. Fosphenytoin (Cerebyx®) 18mg/kg IV/IO at 100-150mg/min (slow IVP) if available.

Do not administer faster than 150mg/min since this may result in hypotension.

      ii. Repeat 100mg IV/IO Q8H for maintenance.
   f. Seizure management:
      i. Diazepam (Valium®) 5-10mg IV/IO q 5 min to maximum dose of 20mg.
      ii. **OR** Midazolam (Versed®) 5mg IV/IO q 5 min (no maximum dose).
      iii. Monitor casualty closely for apnea when administering benzodiazepines.
      iv. Fosphenytoin (Cerebyx®) 18mg/kg IV/IO at 100-150mg/min (slow IVP) if available for seizures refractory to benzodiazepines.

Do not administer faster than 150mg/min since this may result in hypotension.

   g. If cerebrospinal fluid (CSF) is identified leaking from the ears and/or nose, elevate the head 30-60 degrees if the casualty's other injuries permit and the casualty is hemodynamically stable.
   h. If the casualty exhibits signs of increased ICP and is hemodynamically stable, consider elevating the head 20-30 degrees to improve venous outflow from the brain and decrease ICP. Do not elevate the head of a hypovolemic casualty since this will reduce cerebral blood flow.

j. Consider sedation of severe TBI after definitive airway established with midazolam (Versed) 1-2mg/hour IV/IO if no evidence of shock or hypotension.
k. Antibiotic prophylaxis for penetrating head trauma:
   i. Ertapenem (Invanz®) 1gm IV/IO.
   ii. **OR** Ceftriaxone (Rocephin®) 1gm IV/IO.
l. Ensure casualty is evacuated to a facility with a neurosurgeon available.
m. For non-severe head injuries, see *Mild Traumatic Brain Injury (MTBI) Protocol.*

10. Abdominal evisceration:
    a. Control any visible hemorrhage from bowel using approved hemostatic agent or gauze.
    b. Irrigate gross debris off of exposed bowel.
    c. Attempt to gently reduce bowel back into abdominal cavity.
       i. If bowel is reduced, approximate skin (sutures or staples) and cover abdominal wound with dressing.
       ii. If bowel is unable to be reduced, cover bowel with moist dressing.

11. Penetrating eye trauma:
    a. Perform a rapid field test of visual acuity.
    b. Cover the eye with a rigid shield (not a pressure patch).
    c. Ensure antibiotics are administered as per Section 19.

12. Burns:
    a. Facial burns, especially those that occur in closed spaces, are often associated with airway involvement/inhalation injury. Aggressively monitor airway status and oxygen saturation in these patients. Consider early intubation or surgical cricothyroidotomy with sedation. See *Procedural Analgesia Protocol.*
    b. To cover burn areas, consider use of:
       i. Silver impregnated dressings.
       ii. Hydrogel dressings.
       iii. Dry sterile dressings.
    c. Fluid resuscitation for > 20% Total Body Surface Area (TBSA) 2nd/3rd degree burns:
       i. Initiate IV/IO crystalloid administration according to "The Rule of Ten".
          (a) Initial rate is 10ml per %TBSA per hour for a maximum casualty weight of 80kg.
          (b) Add 100ml/hr to the rate for each 10kg above 80kg.
          (c) Example: A 90kg casualty with 50% TBSA burn would receive an initial rate of (10ml x 50)/hr + 100ml/hr or 600ml/hr.
       ii. If crystalloid is not available, Hextend may be used for initial resuscitation
       iii. Resuscitation principles for hemorrhagic shock take precedence over burn resuscitation. See Section 8c (shock) of Tactical Field Care.
    d. If trained, consider escharotomy for:
       i. Circumferential extremity burns with compromised circulation.
       ii. Circumferential thoracic burns with compromised ventilation.
       iii. Limit escharotomy incision to depth of burn.
    e. Do not administer prophylactic antibiotics for burns without other combat wounds.
    f. Splint burned hands and feet in position of function with dressings separating digits.
    g. Aggressive pain management for critical burn patients.
    h. Aggressive hypothermia prevention management, especially for extensive burns.
    i. All trauma care interventions can be performed through burned skin.

13. Inspect and dress all wounds.

14. Fracture/dislocation management:
    a. Attempt to reduce pulseless fractured extremities and dislocations.
    b. Dislocations with distal pulse may be reduced based on evacuation time and training/ experience in procedure.
    c. Splint and recheck pulse.

15. Crush injuries:
    a. Severe and extensive crush injuries may be seen in patients trapped under an overturned vehicle or in a collapsed structure such as a bombed building.
    b. Entrapment may be prolonged due to the requirement for specialized rescue equipment.
    c. See *Crush Syndrome Protocol*.

16. Hypothermia management:
    a. Hypothermia will result in decreased clotting ability in the trauma casualty. Prevention is the key to management, since only limited rewarming is possible in the field.
    b. Minimize the casualty's exposure to the elements. Keep protective gear on or with the casualty if feasible.
    c. Remove wet clothing and replace with dry garments if possible.
    d. Wrap casualty with available insulating material (e.g., CoTCCC recommended commercial systems, sleeping bags, or anything that will retain heat and keeps the casualty dry).
    e. If resuscitation is required, use warmed IV fluids if possible.

17. Monitoring:
    a. Frequently reassess the casualty.
    b. Utilize available monitoring devices (e.g., pulse oximeter, cardiac monitor, etc.).

18. Analgesia:
    a. If able to fight, casualty should take pain medications carried in combat pill pack:
        i. Meloxicam (Mobic®) 15mg PO
        ii. Acetaminophen (Tylenol®) 1gm PO
    b. If unable to fight or there is need for opiate analgesia to control pain:
        i. Naloxone (Narcan®) should be available whenever administering opiates. Monitor for respiratory depression.
        ii. Oral transmucosal fentanyl citrate (OTFC) 400-800µg orally:
            (b) Start with lower dose if unsure of response
            (c) Tape OTFC lozenge to casualty's finger as an added safety measure.
            (d) Reassess in 15 minutes
            (e) Repeat dose once if necessary.
        iii. **OR** Morphine sulfate 5-10mg IV/IO:
            (a) Reassess in 10 minutes.
            (b) Repeat dose as required.
        iv. Odansetron (Zofran®) 4-8mg IV/IO/IM/SL every 8 hours as needed for nausea.
    c. See *Procedural Analgesia Protocol* for analgesia for painful procedures.

19. Antibiotics:
    a. Prophylactic use is recommended for all open combat wounds.
    b. Prophylactic use is **not** recommended for burns in the absence of other concomitant combat wounds.
    c. If able to take oral medications, moxifloxacin (Avelox®) 400mg PO from combat pill pack.
    d. If unable to take oral medications, ertapenem (Invanz®) 1gm IV/IO/IM.

20. Cardiopulmonary resuscitation (CPR):
    a. Battlefield CPR for blunt, blast or penetrating trauma casualties, who have no pulse, respirations, or other signs of life, will not be successful and should not be attempted.
    b. CPR may be considered depending on the tactical situation in certain types of casualties:
        i. Severe hypothermia.
        ii. Chemical warfare agent/toxic exposures (if appropriate antidotes are available).
        iii. Crush syndrome (if ACLS treatments for hyperkalemia are available). See *Crush Syndrome Protocol*.
        iv. Electrocution.

21. Communication / Documentation of care:
    a. Explain procedures and treatments to casualty to reassure and reduce anxiety.
    b. Document clinical assessments, treatments rendered, and changes in casualty's status on a SOF Casualty Card. Forward this information with the casualty to the next level of care.

Extended Tactical Field Care Considerations

1. The unique nature of SOF missions may require tactical field care lasting hours to days before evacuation can be achieved. Identify the potential for prolonged tactical field care during mission planning in order to prepare increased amounts of medical supplies (e.g., carried on vehicles) and/or resupply bundles. Extended Tactical Field Care is presumed to exist when evacuation cannot be performed within the 4 hour time frame doctrinally dictated for Priority patients.

2. Airway Management:
    a. Reverify airway patency and security in a consistent manner.
    b. Suction: Consider periodic suctioning of the oropharynx and endotracheal tube.
    c. Pulmonary toilet: Consider periodic saline flushes (2ml) to clear mucus/blood from ET tube.
    d. Local wound care at cricothyroidotomy site if applicable.

3. Respiratory Management:
    a. Place a small gauge thoracostomy device or chest tube placement if casualty required needle decompression previously.
    b. Apply negative pressure to chest tube if available, not exceeding -20cm water.
    c. Consider rib blocks for pain management.
    d. If available, administer oxygen to maintain O2 saturation > 90% (>95% for TBI).
    e. If patient is being ventilated, maintain strict bagging cycles (1 breath every 5 seconds) and a tidal volume of approximately 500ml to allow for complete exhalation and avoid stacking breaths.
    f. Consider the use of a ventilator/assist device if available. If the device permits, add physiologic positive end-expiratory pressure PEEP (3-5cm water).
    g. Consider sedation with midazolam (Versed) 1-2mg/hr IV/IO in casualties requiring prolonged intubation/ventilation if no shock or hypotension.

4. Flail chest management:
    a. Monitor for developing hypoxia secondary to pulmonary contusions.
    b. Casualty may require positive pressure ventilation.
    c. Ensure adequate analgesia. Consider rib blocks for pain management.
    d. These casualties frequently fatigue and require intubation/definitive surgical airway.

5. Fluid management:
    a. Conscious: Instruct casualty to drink clear liquids up to 1L/hr; consider oral electrolyte supplementation if available.
    b. Unconscious: Insert Foley catheter and titrate IV/IO/NG/PR crystalloid fluids to maintain urine output of 30-50ml/hr.
        i. Clean water may be utilized in lieu of crystalloid for NG/PR infusion.
        ii. Maximum PR fluid infusion rate for stable patients is 200ml/hr.
        iii. Maximum PR fluid infusion rate for volume depleted patients is 500ml/hr.
    c. Critical burn (> 20% TBSA of 2nd/3rd degree burns):
        i. Insert Foley catheter.
        ii. Continue fluid resuscitation according to "The Rule of Ten".
            (a) Initial rate is 10ml per %TBSA /hr for a maximum casualty weight of 80kg.
            (b) Add 100ml/hr to the rate for each 10kg above 80kg.
            (c) Example: A 90kg casualty with 50% TBSA burn would receive an initial rate of (10ml x 50)/hr + 100ml/hr or 600ml/hr.

iii. Adjust fluid rate to maintain urine output of 30-50ml/hr.
iv. Oral fluid administration may be acceptable in burns up to 40% TBSA if crystalloid supplies are limited. Larger burns are associated with ileus and significantly decreased bowel absorption. Use WHO oral rehydration packets if available.

6. Wound care management:
   a. Irrigate and redress wounds (any potable water can be used for irrigation).
   b. Debride only **obviously** devitalized tissue.
   c. Change dressings every 24 hours. Consider converting to silver impregnated dressings to reduce frequency of dressing changes.
   d. Continue antibiotics. Repeat moxifloxacin (Avelox®) 400mg PO or ertapenem (Invanz®) 1gm IV/IO/IM every 24 hours.

7. Analgesia:
   a. See *Procedural Analgesia Protocol* for procedures.
   b. Consider local blocks for pain management.

8. Nutrition management:
   a. Consider oral nutrition if evacuation will be delayed by over 24 hours.

9. Orthopedic/Compartment Syndrome management:
   a. Apply traction splints as required.
   b. Reassess fractures and splint in position of function.
   c. Check neurovascular status after any manipulation.
   d. Be suspicious of compartment syndrome in the following conditions:
      i. Fractures.
      ii. Crush injuries.
      iii. Vascular injuries.
      iv. Circumferential burns.
      v. Multiple penetrating injuries (fragmentation).
   e. Clinical signs of compartment syndrome:
      i. Pain out of proportion to injury.
      ii. Pain with passive motion of muscles in the involved compartment.
      iii. Pallor.
      iv. Paresthesias.
      vii. Pulselessness

      

      Be aware that peripheral pulses are present in 90% of patients with compartment syndrome.
   f. Consider use of compartment pressure monitor if available and trained in its use.
   g. Increasing swelling, decreasing motion, and increasing pain not responsive to analgesics in the appropriate clinical setting should raise the possibility of a developing compartment syndrome.
   h. Compartment syndromes make take hours to develop. For patients with suspected compartment syndrome, reevaluate every 30 minutes for 2 hours, then every hour for 12 hours, then every 2 hours for 24 hours, then every 4-6 hours for 48 hours.
   i. Extremity compartment syndromes may occur in the thigh, lower leg/calf, foot, forearm, and hand.
   j. Compartment syndrome management:
      i. Maintain extremity at level of heart. **Do not elevate.**
      ii. Loosen encircling dressings.
      iii. Urgent evacuation.
   k. Fasciotomy:
      i. Only consider if evacuation is delayed 6 hours or longer and fasciotomy is within the scope of the treating medic/ATP.
      ii. See *Fasciotomy Protocol*.

10. Special blast injury considerations:
    a. Tympanic membranes:
        i. Inspect for perforation if possible.
        ii. Presume perforation in the setting of post-blast hearing loss.
        iii. Dexamethasone (Decadron) 10mg IV/IO/IM/PO QD x 5 days for hearing loss if not contraindicated by other injuries.
    b. Lungs:
        i. Pulmonary overpressure may result in delayed lung injury.
        ii. Monitor patients closely for respiratory deterioration for at least 6 hours post-blast.
    c. Abdomen:
        i. Blast overpressure may result in bowel injury and delayed perforation.
        ii. Acute abdominal pain, especially with evidence of peritoneal irritation, within 72 hours of blast exposure should be presumed to be a bowel perforation. *See Abdominal Pain TMEP.*
    d. Spine:
        i. Patients involved in vehicular blasts or thrown by explosions are at high risk for spinal injury.
        ii. Maintain a high index of suspicion for spinal injury, especially in unconscious patients.

Basic Management Plan for Tactical Evacuation (TACEVAC) Care

1. Airway management:
    a. Confirm airway placement.
    b. Reassess airway patency.

2. Breathing:
    a. Reassess patient for development of tension pneumothorax.
    b. Place a small gauge thoracostomy device or chest tube if:
        i. Patient requires any needle decompressions.
        ii. **OR** no improvement with needle decompression.
        iii. **OR** evacuation time is prolonged (greater than 1 hour).
        iv. **OR** evacuation requires transport at high altitude in unpressurized aircraft.
    c. If available, provide oxygen as needed to maintain O2 saturation > 90% (> 95% for TBI).

3. Bleeding:
    a. Reassess patient and verify bleeding is controlled.
    b. Verify distal pulses are absent in extremities with tourniquets.
    c. Reassess if tourniquet is required or other hemorrhage control means are appropriate.

4. Vascular access:
    a. Reassess IV patency.
    b. Flush IV lines as required.

5. Fluid resuscitation:
    a. Continue resuscitation with blood products, colloid, or crystalloid as indicated.
    b. Maintain a palpable radial pulse or systolic blood pressure of 90mmHg in all unconscious patients with non-compressible internal hemorrhage.
    c. Resuscitate to normal vital signs in the setting of controlled hemorrhage.

6. Head injury management:
    a. Continue to prevent hypotension and hypoxia.
    b. Administer 3% Hypertonic Saline 500ml IV/IO for severe TBI if not already done or patient is continuing to deteriorate rapidly as per Tactical Field Care Section 9 (head injury).

7. Hypothermia management:
   a. Continue hypothermia prevention management or initiate if not already started.
   b. Utilize heating system on evacuation platform and avoid wind exposure.
   c. Use an IV warming device for all fluid administration.

8. Monitoring:
   a. Institute electronic monitoring of vital signs.

9. Check for additional wounds.
   a. Dress all wounds.

10. Continue analgesia as required.

11. Reassess fractures and neurovascular status.
    a. Consider use of traction splints.

12. Antibiotics:
    a. Initiate for all open combat wounds if not already given.

13. Consider use of pneumatic anti-shock garment (PASG) for stabilizing pelvic fractures.
    a. 

DO NOT USE in patients with thoracic or brain injuries.
    b. If PASG not available, use pelvic binder if not already applied previously.

14. Air evacuation/altitude considerations:
    a. Monitor air pressure in extremity air splints during altitude changes.
    b. Replace air with saline in endotracheal tube cuffs.

15. Documentation of Care:
    a. Explain procedures and treatments to patient to reassure and reduce anxiety.
    b. Document clinical assessments, treatments rendered, and changes in patient status on a SOF Casualty Card. Forward this information with the casualty to the next level of care.

CRUSH SYNDROME PROTOCOL

SPECIAL CONSIDERATIONS:
1. Be aware of development of crush syndrome starting as early as 4 hours post injury.
2. These medications are not part of the standard ATP aid bag and require development of a separate crush injury kit.

The principles of hypotensive resuscitation according to TCCC DO NOT apply in the setting of extremity crush injury requiring extrication.

In the setting of a crush injury associated with non compressible (thoracic, abdominal, pelvic) hemorrhage, aggressive fluid resuscitation may result in increased hemorrhage.

With extremity injuries, tourniquets should NOT be applied during Phase 1 unless there is hemorrhage which is not controllable by other means.

Be aware of development of cardiac dysrhythmias due to hyperkalemia immediately following extrication.

DEFINITION:
Massive, prolonged crush injury resulting in profound muscle and soft tissue damage places the patient at significantly increased risk for developing circulatory and renal complications.

MANAGEMENT:
PHASE 1: IMMEDIATE (while attempting extrication):

1. Maintain patent airway (NPA, OPA, etc.) and adequate ventilation.
2. Monitor O_2 sat with pulse ox and administer high flow oxygen if available.
3. Give initial bolus of 1-1.5L of NS **PRIOR** to attempts at extrication and continue at 1.5L/hr.

   

   Ringer's lactate is not recommended due to the potassium content.
4. Maintain urine output at greater than or equal to 200cc/hr. If possible, insert Foley catheter.
5. Assess and reassess mental status.
6. Follow *Pain Management Protocol (TMEP)*
7. Rx Consider prophylactic antibiotics – Ertapenem (Invanz) 1gm IV.
8. Utilize Propack or AED cardiac monitoring if available.
9. Rx Mannitol (administer 1 – 2gm/kg at a rate of 5gm/hr).

   

   Ensure urine output has been established prior to using Mannitol.

PHASE 2: IMMEDIATELY PRIOR TO EXTRICATION:

10. Immediately prior to extrication, apply tourniquets to crushed extremities, if possible.

Phase 2 Recommended Additional Resuscitative Drugs

11. Sodium Bicarbonate – give 1mEq/kg IV immediately prior to extrication (Bristojet 1–2 amps). Additional dosing of Sodium bicarbonate may be required if dysrhythmias or cardiac arrest persist after giving calcium chloride or gluconate

PHASE 3: IMMEDIATELY FOLLOWING EXTRICATION

Cardiac Dysrhythmias or Arrest

12. CPR **should be** initiated if cardiac arrest develops following extrication. **DO NOT** follow the TCCC guidelines on cardiac arrest.

13. If extrication is greater then 4 hours **OR** in the presence of dysrhythmias, administer Calcium Chloride (1gm, 10ml of 10% solution) or Calcium Gluconate (1gm, 10ml of 10% solution).

Calcium should not be given in bicarbonate containing solutions due to precipitation of calcium carbonate.

14. Additional dosing of Sodium bicarbonate may be required if dysrhythmias or cardiac arrest persist after giving calcium chloride or gluconate

15. Following extrication, once the patient is stabilized, be prepared to treat hyperkalemia as tourniquets are released.

DISPOSITION:
Urgent Surgical evacuation

FASCIOTOMY PROTOCOL

SPECIAL CONSIDERATIONS:
1. Compartment syndromes require a high index of suspicion.
2. Do not attempt these procedures if not trained or qualified.

SIGNS AND SYMPTOMS

1. Be suspicious of compartment syndrome in the following conditions:
   - A. Fractures
   - B. Crush injuries
   - C. Vascular injury
   - D. Circumferential burns
   - E. Multiple penetrating injuries (fragmentation)
   - F. Blunt trauma
2. Clinical signs: Accurate diagnosis requires a high rate of suspicion.
   - A. "Classic: Late Signs – 5Ps"
     1) Pain
     2) Pallor
     3) 

     Pulselessness: Be aware that peripheral pulses are present in 90% of patients with compartment syndrome.
     4) Paresthesia
     5) Paralysis
   - B. More common acute findings
     1) Increasing pain
     2) Pain out of proportion to injury
     3) Pain with passive motion of muscles in the involved compartment
     4) Pallor
     5) Paresthesia (numbness)
   - C. Increasing swelling, decreasing motion, and increasing pain not responsive to pain medication in the appropriate clinical setting should raise the possibility of a developing compartment syndrome.
   - D. 

   Compartment syndromes may take hours or days to develop. For patients with suspected compartment syndromes, re-evaluate q 30 minutes for 2 hours, then q 1hr for 12 hrs, then q 2hr for 24 hrs and then q 4-6hr for 48 hrs.
   - E. Compartment Syndromes may occur in the: thigh, lower leg/ calf, foot, forearm, or hand

MANAGEMENT

1. Orthopedic/Compartment Syndrome Management.
2. Apply traction splints as necessary.
3. Assess fractures and splint in position of function.
4. Check neurovascular status after any manipulation.
5. Use compartment pressure monitor if available
   - A. Perfusion pressure = diastolic blood pressure – measured intramuscular pressure
     1) Perfusion Pressure < 30mm is diagnostic for compartment syndrome
     2) Hypotensive patients have a lowered diastolic pressure and may have increased susceptibility to developing a compartment syndrome.
   - B. Repeat measurements if clinically indicated or if patient is obtunded due to narcotic use or head injury
6. Non Surgical Treatment
   - A. Pain Management: See *Pain Management TMEP*

1) WARNING Increasing pain medication requirements may mask development of a compartment syndrome

2) WARNING Narcotic doses which decrease the Soldier's level of consciousness and cause drowsiness will oversedate a patient so that the increaing pain of a compartment syndrome is not recognized.

B. Elevation – Maintain extremity at level of the heart. **DO NOT ELEVATE.**

C. Loosen encircling dressings

7. Surgical (Fasciotomy)

A. See *Procedural Analgesia Protocol* prior to doing procedures

B. WARNING Only consider fasciotomy if:

1) Evacuation is delayed 6 hrs or longer

2) **AND fasciotomy is within the scope of practice of the treating medic**

3) **AND** the following indications exist:

a. Pain with passive motion of the involved muscle group

i. Increasing pain with decreasing response to pain meds

ii. Increasing swelling and tightness in the involved compartment

4) **OR** There are elevated compartment pressures as defined above (#5).

C. WARNING Fasciotomy may be a limb saving procedure in the proper clnical setting. When done for the wrong reasons, or done incorrectly, the potential for serious complications exists.

D. Procedure: Utilize *Procedural Analgesia Protocol*

1) Thigh: anterior skin incision, ID muscle fascia and split fascia only

2) Lower leg/ Calf:

a. Anterior and Lateral Compartments:

i. Identify the anterior tibial crest and then identify the fibula. Make the skin incision from the proximal third to the distal third of the foreleg. The incision is located approximately 2cm anterior to the fibula.

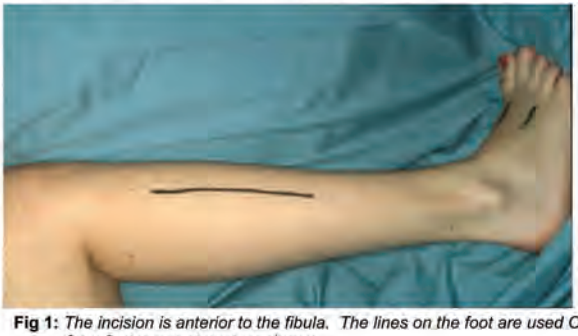

Fig 1: *The incision is anterior to the fibula. The lines on the foot are used ONLY for a foot compartment syndrome.*

ii. Identify the intermuscular septum if possible. Make the anterior fascial incision parallel to the tibial crest and about 1 inch lateral to the tibial crest. The fascial incision should be the length of the skin incision. This releases the anterior compartment. To release the lateral compartment, identify the intermuscular septum approximately half way between the fibula and the anterior tibial crest. Posterior to

this septum, incise the fascia from the proximal aspect to the distal third of the foreleg.

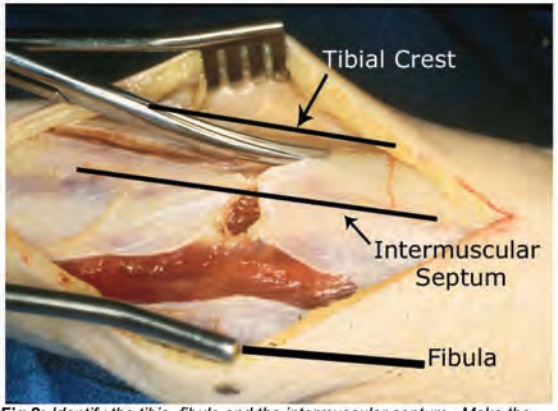

Fig 2: *Identify the tibia, fibula and the intermuscular septum. Make the Fasciotomy incisions anterior and posterior to the septum.*

b. Posterior Compartment:
   i. Make an incision at the posteromedial aspect of the calf from the proximal muscle distally to the distal third of the foreleg. ID the fascia and split the fascia of the superficial muscles. To release the deep posterior compartment, develop the interval between posterior border of the tibia and the superficial posterior compartment. Proceed deep along the posterior border of the tibia. Identify the deep posterior compartment and release the fascia. Be careful of the deep neurovascular structures.

Fig. 3: *The dotted line represents the palpable tibial border and the solid line on the tibia represents the incision line. The solid line on the foot is done ONLY for foot compartment syndromes.*

3) Foot: Make longitudinal incisions between the metacarpals along the dorsal aspect of the foot as shown in figure 1. ID the underlying fascia and incise it. Make a medial foot incision as shown in figure 3 and incise the underlaying fascia.
4) Forearm: Make 20cm longitudinal incisions along the dorsal and volar aspects of the forearm. Identify the underlying fascia and split the fascia. Avoid cutting tendons and nerves.

Fig. 4: *Dorsal arm incision for forearm dorsal compartment release. Dorsal hand incisions used only for hand compartment syndrome.*

Fig.5: *Volar arm incision used for forearm compartment syndrome release.*

5) Hand: Make a 5cm longitudinal incision between the 2nd and 3rd, and the 3rd and 4th metacarpals on the dorsal aspect of the hand as shown in figure 4. Avoid cutting the extensor tendons. Split the underlying fascia.

E. Leave all wounds open and apply dressings.
F. Urgent evacuation

MILD TRAUMATIC BRAIN INJURY (MTBI)

SPECIAL CONSIDERATIONS:

1. Mandatory events requiring MACE:
   a. Personnel in a vehicle associated with a blast, collision or rollover
   b. Personnel within 150 meters of a blast
   c. Personnel with a direct blow to the head
   d. Command directed evaluation
2. NOT allow a patient with a mTBI to return to duty while they are symptomatic. This puts them at significant risk for greater injury (to include death) if they sustain another head injury while still symptomatic.
3. mTBI is primarily a clinical diagnosis. If you do not feel that a patient is back to their baseline, do not allow them to RTD and consult a medical provider

SIGNS AND SYMPTOMS:

1. **Red Flags (Symptoms):**
   A. Neurological
      1) Witnessed loss of consciousness
      2) Amnesia/memory problems
      3) Unusual behavior/combative
      4) Seizures
      5) Worsening headache
      6) Cannot recognize people
      7) Disoriented to time and/or place
      8) Abnormal speech
   B. Eyes
      1) Double vision
   C. General
      1) 2 or more blast exposures within 72 hours
      2) Repeated vomiting
      3) Weakness
      4) Unsteady on feet

MANAGEMENT:

1. Consider mTBI (concussion) in anyone who is dazed, confused, "saw stars", lost consciousness (even if just momentarily) or has memory loss that results from a fall, explosion, motor vehicle crash or any other event involving abrupt head movement, a direct blow to the head or other head injury
2. Triage and treat other injuries as required. As soon as tactically feasible evaluate for mTBI
3. Red Flags present
   A. If red flags are present - consult with medical provider for possible urgent evacuation.
4. Administer MACE
   A. If MACE <25 or symptoms persist despite rest and appropriate treatment consult with medical provider for possible priority evacuation.
   B. If MACE is normal:
      a. Recommend 24 hour rest and re-evaluate
5. Follow Service specific, DVBIC, JTTG guidelines
6. 

Contraindications:
   A. If possible, avoid the use of Cox 1 NSAID medication (Motrin/ibuprofen, Aleve/naprosyn) due to effects on platelets and a potentially increased risk of bleeding. If COX 1 NSAIDS are the only medication available and the patient has no red flags they MAY be used to treat the headache.
   B. Avoid the use of tramadol (Ultram) due to its effects on platelets, increased bleeding and altered level of consciousness.
   C. Avoid the use of diphenhydramine (Benadryl) due to possibly alteration of the patient's level of consciousness
   D. Avoid the use of narcotics due to alteration of the patient's level of consciousness

DISPOSITION:

- *Urgent* evacuation in the presence of Red Flags
- *Priority* evacuation in the presence of MACE <25 and persistent symptoms despite appropriate treatment and rest
- *Routine* evacuation MACE persistently <25 OR MACE >25 and persistent symptoms despite appropriate treatment

Military Acute Concussion Evaluation (MACE)

Defense and Veterans Brain Injury Center

Patient Name: _____

SS#: _____-_____-_____ **Unit:** _____

Date of Injury: ____/____/____

Time of Injury: _____

Examiner: _____

Date of Evaluation: ____/____/____

Time of Evaluation: _____

History: (I – VIII)

I. Description of Incident

Ask:

a) What happened?

b) Tell me what you remember.

c) Were you dazed, confused, "saw stars"?
Yes No

d) Did you hit your head? Yes No

II. Cause of Injury (Circle all that apply):

1) Explosion/Blast 4) Fragment
2) Blunt object 5) Fall
3) Motor Vehicle Crash 6) Gunshot wound
7) Other _____

III. Was a helmet worn? Yes No

Type _____

IV. Amnesia Before: Are there any events just BEFORE the injury that are not remembered? (Assess for continuous memory prior to injury)

Yes No If yes, how long _____

V. Amnesia After: Are there any events just AFTER the injuries that are not remembered? (Assess time until continuous memory after the injury)

Yes No If yes, how long _____

VI. Does the individual report loss of consciousness or "blacking out"?

Yes No If yes, how long _____

VII. Did anyone observe a period of loss of consciousness or unresponsiveness?

Yes No If yes, how long _____

VIII. Symptoms (circle all that apply)

1) Headache 2) Dizziness
3) Memory Problems 4) Balance problems
5) Nausea/Vomiting 6) Difficulty Concentrating
7) Irritability 8) Visual Disturbances
9) Ringing in the ears 10) Other _____

Examination: (IX – XIII)

Evaluate each domain. Total possible score is 30.

IX. Orientation (1 point each)

Month:	0	1
Date:	0	1
Day of Week:	0	1
Year:	0	1
Time:	0	1

Orientation Total Score ____/5

Military Acute Concussion Evaluation (MACE)

Defense and Veterans Brain Injury Center

X. Immediate Memory:

Read all 5 words and ask the patient to recall them in any order. Repeat two more times for a total of three trials.

(1 point for each correct, total over 3 trials)

List	Trial 1		Trial 2		Trial 3	
Elbow	0	1	0	1	0	1
Apple	0	1	0	1	0	1
Carpet	0	1	0	1	0	1
Saddle	0	1	0	1	0	1
Bubble	0	1	0	1	0	1
Trial Score						

Immediate Memory Total Score _____/15

XI. Neurological Screening

As the clinical condition permits, check

Eyes: pupillary response and tracking

Verbal: speech fluency and word finding

Motor: pronator drift, gait/coordination

Record any abnormalities. **No points are given for this.**

XII. Concentration

Reverse Digits: (go to next string length if correct on first trial. Stop if incorrect on both trials.) 1 pt. for each string length.

4-9-3	6-2-9	0	1
3-8-1-4	3-2-7-9	0	1
6-2-9-7-1	1-5-2-8-5	0	1
7-1-8-4-6-2	5-3-9-1-4-8	0	1

Months in reverse order:

(1 pt. for entire sequence correct)

Dec-Nov-Oct-Sep-Aug-Jul

Jun-May-Apr-Mar-Feb-Jan 0 1

Concentration Total Score ____/5

XIII. Delayed Recall (1 pt. each)

Ask the patient to recall the 5 words from the earlier memory test (Do NOT reread the word list.)

Elbow	0	1
Apple	0	1
Carpet	0	1
Saddle	0	1
Bubble	0	1

Delayed Recall Total Score ____/5

TOTAL SCORE _____/30

Notes: _____

Diagnosis: (circle one or write in diagnoses)

No concussion

850.0 Concussion without

Loss of Consciousness (LOC)

850.1 Concussion with

Loss of Consciousness (LOC)

Other diagnoses _____

McCrea, M., Kelly, J. & Randolph, C. (2000). *Standardized Assessment of Concussion (SAC): Manual for Administration, Scoring, and Interpretation.* (2nd ed.) Waukesa,WI: Authors.

Defense & Veterans Brain Injury Center
1-800-870-9244 or DSN: 662-6345

PROCEDURAL ANALGESIA PROTOCOL

SPECIAL CONSIDERATIONS:

1. Intended for performing brief, significantly painful procedures such as chest tube insertion or fracture reduction.
2. Prior to initiating this protocol, the following should be accomplished:
   A. Vascular access.
   B. Airway equipment, suction, and bag valve mask device immediately available and with reach.
   C. Monitoring equipment (if available) on and attached to patient (if tactically feasible).
3.  Concomitant administration of narcotics and benzodiazepines increases the risk for respiratory depression and hemodynamic instability. Use caution. Do not use in patients with shock or hypotension.
4. Once the protocol has been initiated, monitor patient vigorously.

SINGLE AGENT

1.  Morphine 5mg IV/IO q 5 min to a maximum total dose of 20mg.
2. In the event of respiratory depression, administer naloxone (Narcan®) in 0.1mg IV/IO increments until respiratory effort is adequate.

DUAL AGENT

1.  Midazolam (Versed®) 2mg IV/IO over 1 minute, followed by 0.5-1mg increments after 5 minutes to a maximum total dose of 4mg.
2. **PLUS**  ketamine (Ketalar®) 20mg IV/IO over 1 minute, followed by 20mg increments every 30-60 seconds until nystagmus occurs or a maximum total dose of 100mg.

2010 USSOCOM Tactical Trauma Protocols

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U.S. SPECIAL OPERATIONS COMMAND

TACTICAL MEDICAL EMERGENCY PROTOCOLS (TMEP)

For SPECIAL OPERATIONS ADVANCED TACTICAL PRACTITIONERS (ATPs)

JANUARY 10, 2011

USSOCOM OFFICE OF THE COMMAND SURGEON
DEPARTMENT OF EMERGENCY MEDICAL SERVICES AND PUBLIC HEALTH
7701 Tampa Point Boulevard
MacDill Air Force Base, FL 33621
(813) 826-5065

PREFACE

Management of medical emergencies is best accomplished by appropriately trained physicians in an Emergency Department setting. Special Operations Combat Medics (SOCMs); however, may often find themselves in austere tactical environments where evacuation of a teammate to an MTF for a medical emergency would entail either significant delays to treatment or compromise the unit's mission. Although SOCM trained medics are not routinely authorized by the services to treat non-traumatic emergencies, in many SOF situations, training SOCMs to treat at least some medical emergencies may result in both improved outcome for the individual and an improved probability of mission success. The disorders chosen have one of the following properties in common: they are relatively common; they are acute in onset; the SOCM is able to provide at least initial therapy that may favorably alter the eventual outcome; and the condition is either life-threatening or could adversely affect the mission readiness of the SOF operator.

The Protocols outlined in the following pages carry the following assumptions:

A. **The SOCM medic is in an austere environment where a medical treatment facility or a unit sick call capability is not available. If a medical treatment facility or a medic authorized to treat patients independently is available, then the patient should be seen in those settings rather than by a SOCM medic.**
B. Immediate evacuation may not be possible and, even if it is, may still entail significant delays to definitive treatment. The medical problem may worsen significantly if treatment is delayed.
C. The SOCM will contact a consulting physician as soon as feasible.
D. SOCM treatment will be done under the appropriate Protocol.
E. **Medication regimens are designed to minimize the number of medications the SOCMs are required to learn and carry. Medications have been used for multiple conditions when feasible without compromising care.**
F. Appropriate documentation of diagnosis and treatment rendered in the patient's medical record will be accomplished when the unit returns to forward operating base.
G. Note these Protocols are not designed to allow SOCM medics to conduct Medical/ Civic Action (MEDCAP) missions independently.
H. Evacuation recommendations are based on the appropriate therapy per Protocol being initiated on diagnosis.
I. The definitions of Urgent, Priority, and Routine evacuations are based on the times found in Joint Publication (FM) 4-02.2 of 2, 4, and 24 hours respectively.
J. For any infection, limit contact and use universal precautions.

Changes for 2007:
A. The changes in the combat pill pack (Moxifloxacin (Avelox) and meloxicam), as recommended by the Committee on Tactical Combat Casualty Care (CoTCCC), have been changed in the TME Protocols. (2007)
B. The Fentanyl oral dosage of 800mcg, as recommended by the CoTCCC has been incorporated into the Pain Protocol. (2007)
C. The change in the IV antibiotics has also been changed to reflect medication availability.
D. When possible, alternate antibiotics or anti-emetics have been listed.

Changes for 2008:
A. The Cellulitis and Cutaneous Abscess Protocols were combined.
B. An Altitude Illness Protocol was created, combining AMS, HACE, and HAPE.
C. The Chest Pain was expanded to provide more guidance.
D. The following new protocols were added: Determination of Death and Envenomation.
E. The following medication changes were made: the use of Zithromax was decreased; Keflex, Quinine, Doxycycline, and Corticosporin Otic were removed.
F. The following medications were added: Amoxicillin/Clavulanic Acid (Augmentin), Rabeprazole (Aciphex), Septra DS, Salmeterol (Serevent), Rifampin, Toradol, and Benadryl Quikstrips.
G. The Meningitis Disposition typo error from 2007 was corrected.
H. Modifications were made to most of the TMEPS with respect to further refinement in recommendations.
I. The "Clinical Pearls" section was added.

Changes for 2009:
A. Crush Protocol added
B. Blast Protocol added
C. MACE added
D. Traumatic Brain Injury – Mild (mTBI) Protocol added
E. Bronchitis/Pneumonia: Disposition changed
F. Flank Pain: antibiotics modified (order of preference)
G. Joint Infection: antibiotics modified (order of preference)
H. Spontaneous Pneumothorax: indications for tube thoracostomy added
I. Urinary Tract Infections: antibiotics modified
J. Drugs added: Calcium Chloride, Calcium Gluconate, Sodium Bicarbonate, Mannitol
K. HIV PEP Protocol updated with new medications added: Atripla, Truvada, Viread, Kaletra
L. Behavioral Changes Protocol changed and midazolam (Versed) added
M. Seizure Protocol changed and midazolam (Versed) added

Changes for 2010:
A. K-9 Protocols added
B. Drugs added: tadalafi (Cialis), sildenafil (Viagra)
C. Altitude Illness changed to add tadalafi (Cialis) and sildenafil (Viagra)

Changes for 2011:
A. Trauma Protocols added
B. TMEP Seizure protocol updated to match Trauma Seizure protocol
C. Drugs added: fosphenytoin (Cerebyx)
D. Blast TMEP moved to, and incorporated into, the Tactical Trauma Protocols
E. Crush TMEP moved to Tactical Trauma Protocols
F. Rewrite of majority of Tactical Medical Emergency Protocols
G. Expansion of Envenomation Protocols
H. Revision of Cold Injury Protocol
I. Revision of Heat Illness Protocol
J. Revision of K-9 Protocol

Don't Forget...
(Clinical Pearls)

When IV route is recommended, but not obtainable, consider IO, IM, or PO unless contraindicated.

Currently available SL medication formulations include: Benadryl Quikstrips, Sudafed PE SL, Zofran ODT.

If crystalloids (Normal Saline or Lactated Ringer's) are recommended but not available, substitute Hextend or Hespan if available.

DO NOT give Epinephrine IV **unless given under the ACLS protocols**

All IV medications may be given slow IV push with the exception of antibiotics which should be in a drip, unless otherwise specified.

Remember to document dose and time of all medications so the receiving facility may be informed.

Do not use local anesthetic with epinephrine on the ears, nose, digits, and penis.

When oxygen is called for in the Protocols, the authors realize that it is recommended, but may not be available.

Due to the high level of physical fitness of SOF personnel, there may be a prolonged period of mental lucidity and apparent stable vital signs despite a severe injury. Treat the injury, not the operator!

Medical Documentation (SOAP note): In order to ensure proper care and medical information transfer during patient treatment a standardize format for medical documentation is required. The standard format is the SOAP note (Subjective, Objective, Assessment, and Plan).

Subjective: In the patient's own words, describe the chief complaint. At a minimum you need to include the OPQRST (Onset, Palliative or Provocative, Quality, Radiation, Severity, and Time line of symptoms). AMPLE (Allergies, Medication, Past Medical and Surgical history, Last meal, and Events leading up to this condition) history is also included in this section

Objective: vital signs and physical examination findings. At a minimum you need to document pertinent positives and negatives, and measurements of injuries or lesions. Be as detailed as possible.

Assessment: a brief summary of your medical decision making to include what you think it is and what it is not. Include your differential diagnosis list in this section.

Plan: your course of treatment to include any medications, additional studies, consultation, rehabilitation, evacuation category and disposition of the patient.

ABDOMINAL PAIN

SPECIAL CONSIDERATIONS:
1. Common causes in young healthy adults include appendicitis, cholecystitis, pancreatitis, perforated ulcer, and diverticulitis.
2. Consider constipation/ fecal impaction as a potential cause of abdominal pain.
3. Consider bowel perforation if abdominal pain begins within 72 hours of a blast injury.

SIGNS AND SYMPTOMS SUGGESTIVE FOR URGENT EVACUATION:
1. Severe, persistent or worsening abdominal pain is the key sign
2. Rigid abdomen
3. Rebound abdominal tenderness
4. Fever
5. Absence of bowel sounds
6. Focal percussive tenderness
7. Uncontrollable vomiting
8. Presence of bloody vomitus or stools
9. Presence of black tarry stools
10. Presence of coffee ground vomitus

MANAGEMENT:
1. Start IV with normal saline (NS), 1 liter bolus, followed by NS 150cc/hr. Keep NPO except for medications or PO hydration.
2. Ertapenem (Invanz) 1gm IV qd
3. **OR** Ceftriaxone (Rocephin) 1gm IV qd. plus Metronidazole (Flagyl) 500mg PO q 8hr
4. Treat per *Pain Protocol* ***(DO NOT USE NSAIDS)***
5. Treat per *Nausea and Vomiting Protocol*

DISPOSITION: *Urgent* evacuation to a surgical facility.

SIGNS AND SYMPTOMS SUGGESTIVE FOR CONTINUED OBSERVATION:
1. Epigastric burning pain
2. Present bowel sounds
3. Nausea and/ or vomiting
4. Absence of rebound tenderness
5. If diarrhea is present, treat per *Gastroenteritis Protocol*

MANAGEMENT:
1. Antacid of choice
2. Ranitidine (Zantac) 150mg PO bid **OR** Rabeprazole (Aciphex) 20mg PO qd
3. PO hydration

DISPOSITION:
1. Observation and re-evaluation.
2. *Priority* evacuation if symptoms not controlled by this management within 12 hours.

ALLERGIC RHINITIS/ HAY FEVER/ COLD-LIKE SYMPTOMS

SPECIAL CONSIDERATIONS:
History of allergies to cedar, mold, pollen, etc.

SIGNS AND SYMPTOMS:
1. Clear nasal drainage
2. Pale, boggy or inflamed nasal mucosa
3. With or without complaints of nasal congestion
4. Watery or red eyes
5. Sneezing
6. Normal temperature

MANAGEMENT:

1.  Pseudoephedrine (Sudafed) 60mg PO q 4–6hr.
2.  Diphenhydramine (Benadryl) 25–50mg PO q 6hr if tactically feasible. (Drowsiness is a side-effect.)
3. Increase oral fluid intake.

DISPOSITION:
None applicable

ALTITUDE ILLNESS

SPECIAL CONSIDERATIONS

ACUTE MOUNTAIN SICKNESS (AMS)

1. Usually occurs at altitudes of 8,000ft and higher.
2. Consider pretreatment when rapid ascent to altitudes above 8,000ft may occur:
   A. Acetazolamide (Diamox) 125mg bid started 24 hours before ascent
   B. Dexamethasone (Decadron) 4mg PO bid started 24 hours before ascent for patients allergic to sulfa drugs
3. Consider pretreatment if rapid ascent above 11,500ft occurs (as with airlifts):
   A. Dexamethasone (Decadron) 4mg PO q 6hr within 24 hours of ascent plus acetazolamide (Diamox) 125mg PO bid (if not allergic to sulfa)
4. Symptoms may occur as quickly as 3 hours after ascent.
5. Can avoid onset by limiting initial ascent to no higher than 8,000ft then 1,000ft. per day thereafter. The key to prevention is slow, gradual ascent.

HIGH ALTITUDE CEREBRAL EDEMA (HACE)

1. Rare below 11,500ft.
2. Headache is common at altitude. Ataxia and altered mental status at altitude are HACE until proven otherwise.

HIGH ALTITUDE PULMONARY EDEMA (HAPE)

1. Caused by the hypoxia of altitude, HAPE is the most common cause of death from altitude illness.
2. Usually occurs above 8,000ft. Respiratory distress at high altitude is HAPE until proven otherwise.
3. Nifedipine (Procardia) is recommended as prophylaxis in personnel who have a history of previous HAPE and are required to operate at altitude. Acetazolamide (Diamox), sildenafil (Viagra), tadalafil (Cialis), dexamethasone (Decadron), salmeterol (Serevent), and albuterol (Proventil) may be considered if nifedipine is not available.

HACE AND HAPE MAY COEXIST IN THE SAME PATIENT!

SIGNS AND SYMPTOMS:

1. AMS is generally benign and self-limiting, but symptoms may become debilitating. Worsening condition should prompt consideration of a more life-threatening condition (HAPE or HACE).
   A. AMS: Diagnosis is made in presence of headache **AND** one or more of the following: anorexia, nausea, vomiting, insomnia, dizziness, lassitude, or fatigue
   B. No correlation with fitness level (likely genetic predisposition)
2. HACE: Unsteady, wide, and unbalanced (ataxic) gait and altered mental status are hallmark signs.
3. HAPE: Dyspnea at rest is the hallmark signs. Other symptoms may include cough, crackles upon auscultation, tachypnea, tachycardia, fever, central cyanosis, or low oxygen saturation disproportionate to the elevation level.

MANAGEMENT:

1. Halt ascent. Immediately descend at least 3,000ft for HACE, HAPE, or refractory AMS if tactically feasible.
2. **IF AMS SYMPTOMS PRESENT**

A. Acetazolamide (Diamox) 250mg PO bid **UNLESS PATIENT IS ALLERGIC TO SULFA**

B. Dexamethasone (Decadron) 4mg PO q 6hr if patient is allergic to sulfa

If Dexamethasone (Decadron) is administered, no further ascent until asymptomatic for 24 hours after last Dexamethasone dose.

3. **IF HACE SYMPTOMS PRESENT; ATAXIA OR ALTERED MENTAL STATUS**
   A. Administer supplemental oxygen to bring SaO2 above 90% (if available)
   B. 
   Dexamethasone (Decadron) 8mg IV/ IM STAT, then 4mg IV / IM q 6hr
   C. 

   Individuals with HACE should not be left alone and especially not be allowed to descend alone.

4. **IF HAPE SYMPTOMS PRESENT: SHORTNESS OF BREATH AT REST**
   A. Administer supplemental oxygen to bring SaO2 above 90% (if available)
   B. 
   Nifedipine (Procardia) 30mg SR q 12hr or 20mg SR q 8hr if blood pressure is stable
   1) **IF NIFEDIPINE IS NOT AVAILABLE:** sildenafil (Viagra) 50mg q 8hr, or tadalifil (Cialis) 10mg q 12hr
   2) 

   Do not use Nifedipine in HACE; the drop in blood pressure will worsen the symptoms of this condition.
   C. 
   Consider Salmeterol (Serevent) 2 inhalations q 12hr. or albuterol (Ventolin) 2 inhalations q 6hr as an adjunct treatment
   D. 

   Minimize patient exertion during descent for HAPE since this will exacerbate symptoms

5. Treat per *Pain Management Protocol,* but avoid the use of narcotics since they may depress respiratory drive and worsen high altitude illness.

6. Treat per *Nausea and Vomiting Protocol*

7. For signs or symptoms of either HAPE or HACE: If immediate descent is not tactically feasible and a GAMOW bag is available, use a GAMOW bag in 1 hour treatment sessions with bag inflated to a pressure of 2psi (approximately 100mmHg) above ambient pressure. Four or five sessions are typical for effective treatment. GAMOW BAG **TREATMENT IS NOT A SUBSTITUTE FOR DESCENT.**

8. Treat per *Dehydration Protocol.*

DISPOSITION:
1. Most cases of AMS are relatively mild, resolve in 2-3 days, and do not require evacuation.
2. Avoid vigorous activity for 3-5 days.
3. *Priority* evacuation for AMS patients that worsen despite therapy.
4. *Urgent* evacuation for patients with suspected HACE or HAPE.
5. Individuals who have recovered from HACE or HAPE should not re-ascend without medical officer clearance.

ANAPHYLACTIC REACTION

SPECIAL CONSIDERATIONS:
1. Acute, widely distributed form of shock which occurs within minutes of exposure to an allergen.
2. Primary causes include insect envenomation, medications, and food allergies.
3. Death can result from airway compromise, inability to ventilate, or cardiovascular collapse.
4. The Medic's responsibility is to know if members in the unit have such a condition. Moreover, the Medic must also ensure that the member has some sort of anaphylaxis kit and is trained to use it.
5. Consider localized allergic reaction. Anaphylaxis is a life-threatening emergency.

SIGNS AND SYMPTOMS:
1. Wheezing (bronchospasm)
2. Dyspnea
3. Stridor (laryngeal edema)
4. Angioedema
5. Urticaria (Hives)
6. Hypotension
7. Tachycardia

MANAGEMENT:
FOR PATIENTS WITH SIGNS AND SYMPTOMS OF AIRWAY INVOLVEMENT AND/ OR CIRCULATORY COLLAPSE:

1.  Epinephrine is the mainstay of therapy.
   A. Administer Epi-Pen
   B. **OR** epinephrine 0.5mg (0.5ml of 1:1000 IM). **DO NOT USE INTRAVENOUSLY**
   C. Repeat epinephrine q 5 minutes prn

2. Oxygen with pulse oximetry monitoring

3.  If severe respiratory distress exists, aggressive airway management with bag-valve-mask and airway adjuncts (oral and nasopharyngeal airways). Intubate early if no response to epinephrine.

4. IV normal saline TKO (saline lock).
   A. Administer 1-2 liters normal saline bolus for hypotension;
   B. Titrate to establish systolic blood pressure > 90mmHg or palpable radial pulse if BP cuff not available.

5.  Diphenhydramine (Benadryl) 50mg IV / IM / PO / SL.

6.  Dexamethasone (Decadron) 10mg IV/ IM / PO.

7.  If wheezing is present after epinephrine administration, consider Albuterol (Ventolin), 2-3 puffs q 5 minutes, repeat up to 3 times. The metered dose inhaler works best when used with a spacer (e.g., rolled up piece of paper, cardboard from toilet paper roll, etc).

8.  Ranitidine (Zantac) 150mg PO bid.

DISPOSITION:
1. *Urgent* evacuation.

ASTHMA (REACTIVE AIRWAY DISEASE)

SPECIAL CONSIDERATIONS:
Other disorders to consider: anaphylactic reaction, spontaneous pneumothorax, HAPE, and pulmonary embolism.

SIGNS AND SYMPTOMS:
1. Wheezing
2. Dyspnea
3. Difficulty with speaking in full sentences.

MANAGEMENT:

1.  Albuterol (Ventolin) (metered dose inhaler – works best when used with spacer), 2-3 puffs q 5 min, repeat up to 3 times.
2.  **IF THERE IS NO RESPONSE TO ALBUTEROL** (Ventolin), Epinephrine 0.5mg (0.5ml of 1:1000 solution) IM **(DO NOT INJECT INTRAVENOUSLY)**. May repeat one dose in 5-10 min.
3. Oxygen with pulse oximetry monitoring.
4. IV access with saline lock.
5.  Dexamethasone (Decadron) 10mg IV / IM / PO.
6. If there is fever, pleuritic chest pain and productive cough, treat per *Bronchitis/Pneumonia Protocol.*

DISPOSITION:
1. *Urgent* evacuation if no response to treatment.
2. If the patient responds to management, observe for 4 hours.
   A. Return To Duty if there is no wheezing or dyspnea and normal oxygen saturation. Continue Albuterol (Ventolin) (2 puffs q 6 h) and re-evaluate in 24 hours. Continue Decadron 10mg IM qd for 4 days.
   B. *Urgent* evacuation if symptoms persist.

BACK PAIN

SPECIAL CONSIDERATIONS:
Motor weakness, saddle anesthesia, sensory loss, loss of bowel or bladder control in the setting of back pain is a neurological emergency requiring *Urgent* evacuation.

SIGNS AND SYMPTOMS:
1. Pain may worsen with movement.
2. Pain may radiate into legs.

MANAGEMENT:

1.  Treat per *Pain Management Protocol*.
2. Apply cold compress to painful area for 20-25 min tid.
3.  Trigger point injections with local anesthetic (**IF TRAINED**). Lidocaine 1-2cc per trigger point. May repeat qd for 2 days.
4.  Consider Diazepam (Valium) 5-10mg IM / IV / PO. Repeat once in 6-8hr prn.
5. Minimize activity initially, but encourage gradual stretching and return to full mobility as soon as tolerated.
6. If back pain is accompanied by fever and / or urinary symptoms, treat per *Flank Pain Protocol*.

DISPOSITION:
1. Evacuation is often not required if the back pain responds to therapy.
2. *Routine* evacuation for severe cases not responding to therapy.
3. *Urgent* evacuation for patients with neurological involvement (other than pain) such as:
   A. Weakness
   B. Bowel or bladder dysfunction
   C. Saddle anesthesia

BAROTRAUMA

SPECIAL CONSIDERATIONS:

1. Pulmonary Over-Inflation Syndrome (POIS) may occur from ascent from depth if compressed air was used or exposure to blast overpressure.
2. The most commonly affected site is the middle ear and tympanic membrane, but paranasal sinuses and teeth may be affected.
3. Pulmonary barotrauma occurs when compressed air is breathed at depth followed by ascending with a closed airway (i.e. breath-holding), and can cause pneumothorax or arterial gas embolism.

SIGNS AND SYMPTOMS:

1. Pain in the ear(s), sinuses, teeth.
2. Pulmonary over-inflation syndrome (POIS) may present with chest pain, dyspnea, mediastinal emphysema, subcutaneous emphysema, pneumothorax or AGE.
   A. Arterial gas embolism (AGE) – unconsciousness, paralysis, weakness, fatigue, large areas of abnormal sensations, convulsions. Symptoms usually occur within 10 minutes of surfacing after a dive or shortly after overpressure exposure (blast injury).
   B. In all cases of AGE associated pneumothorax it is possible and should not be overlooked.

MANAGEMENT:

1. If flying, descend to altitude until relief is felt (if feasible).

2. Middle ear
   A. If a tympanic membrane rupture is present or suspected, protect the ear from water or further trauma.
   B. Rx Moxifloxacin (Avelox) 400mg PO qd if contamination is suspected
   C. Rx Pseudoephedrine (Sudafed) 60mg PO q 4–6hr prn
   D. **DO NOT** use ear drops. If TM is not ruptured, use Afrin (oxymetazoline) nasal spray.
   E. Refer to higher level of care when feasible

3. Paranasal Sinus barotraumas.
   A. Rx Pseudoephedrine (Sudafed) 60mg PO q 4-6hr prn

4. Pulmonary barotraumas (to include subcutaneous emphysema):
   A. If no respiratory distress, monitor patient closely. Use pulse oximetry if available
   B. If respiratory distress occurs – Treat per *Spontaneous Pneumothorax Protocol*

5. If Pulmonary Over Inflation Syndrome (POIS) is suspected, administer 100% oxygen and 1 liter normal saline IV 150cc/hr. *Urgent* evacuation to recompression chamber.

6. WARNING If an unpressurized airframe is used, avoid altitude exposure greater than 1000ft.

7. Treat per *Pain Management Protocol.* (Avoid narcotics if recompression is anticipated.)

DISPOSITION

1. *Urgent* Evacuation for cerebral arterial gas embolus, POIS or pneumothorax with respiratory distress,
2. Mild to moderate middle ear, sinus, or pulmonary barotraumas without respiratory distress, observation and *Routine* evacuation.
3. *Routine* evacuation for consultation for Tympanic Membrane rupture.

BEHAVIORAL CHANGES
(INCLUDES PSYCHOSIS, DEPRESSION AND SUICIDAL IMPULSES)

SPECIAL CONSIDERATIONS:

1. In a tactical setting consider sleep deprivation as a cause.
2. Etiologies are numerous and will often dictate the management; thus mental status changes could be caused by head trauma, metabolic and endocrine disease processes, environmental toxins, infections, combat stress disorder, hypoxia, hyperthermia, hypothermia, pharmaceutical agent use (i.e., mefloquine) or withdrawal.
3. Consider diabetic hypoglycemia as a cause of altered mental status.

SIGNS AND SYMPTOMS:

1. Acute behavioral changes include withdrawal, depression, aggression, confusion, or other behavioral patterns atypical for the individual.
2. Psychosis is an acute change in mental status characterized by altered sensory perceptions that are not congruent with reality:
   A. Auditory and/ or visual hallucinations
   B. May include violent or paranoid behavior
   C. Disorganized speech patterns are common
   D. May include severe withdrawal from associates

MANAGEMENT:

1. Remove all weapons or potential weapons from patient AND treating Medic.
2. Check pulse oximetry.
3. Place patient in safe environment under continuous surveillance.
4. Place either 1 tube of Glutose (oral glucose gel) or contents of one packet of sugar in the buccal mucosal region for possible hypoglycemia.
5. Take Temperature
   A. If Temperature is below 95 degrees, treat per *Hypothermia Protocol*
   B. If Temperature is above 101 degrees, treat per *Meningitis Protocol*
   C. If Temperature is above 103 degrees, treat per *Meningitis and Hyperthermia Protocols*
   D. 

IF MENINGITIS IS SUSPECTED OR IF THERE IS A DECREASE IN MENTAL STATUS, USE VALIUM WITH CAUTION, DUE TO POSSIBLE RESPIRATORY DEPRESSION, HYPOTENSION, AND MASKING OF PROGRESSION OF DISEASE RELATED ALTERED MENTAL STATUS.
6.  For acute agitation, combativeness, or violent behavior, restrain patient with at least four individuals and give diazepam (Valium) 10mg IM. Repeat after 30 minutes prn.
   OR Midazolam (Versed) 5mg IM.
7. 

If sedated or restrained, maintain constant vigilance for a change in the hemodynamic status or loss of airway reflexes.

DISPOSITION:
Urgent Evacuation

BRONCHITIS/ PNEUMONIA

SPECIAL CONSIDERATIONS:
1. Consider high altitude pulmonary edema (HAPE) at high altitudes.
2. Consider pulmonary embolism (PE) and pneumothorax (fever and productive cough are atypical for these).

SIGNS AND SYMPTOMS:
1. Fever
2. Productive cough, especially with dark yellow, red tinged, or greenish sputum
3. Chest pain
4. Rhonchi may be present and breath sounds may be decreased over the affected lung
5. Dyspnea may be present in severe cases

MANAGEMENT:
1.  Azithromycin (Zithromax) 500mg PO first dose then 250mg qd for 4 days **OR** Moxifloxacin (Avelox) 400mg PO qd for 7 days.
2.  If unable to tolerate PO intake, Ertapenem (Invanz) 1gm IV / IM **OR** Ceftriaxone (Rocephin) 1gm IV qd.
3.  Albuterol (Ventolin) by metered dose inhaler 2–4 puffs q 4–6hr.
4. Treat per *Pain Management Protocol*.
5. If febrile, acetaminophen 1gm PO q 6hr.
6. Pulse oximetry monitoring.
7. Oxygen prn.
8. If at high altitude, see *Altitude Illness Protocol* and treat for HAPE.

DISPOSITION:
1. *Urgent* evacuation for severe dyspnea or hypoxia.
2. *Observation or Routine evacuation* as necessary.

CELLULITIS/CUTANEOUS ABSCESS

SPECIAL CONSIDERATIONS:
1. Superficial bacterial skin infection
2. Generally begins about 24 hours following a break in the skin, but more serious types of cellulitis may be seen as early as 6–8hr following animal or human bites.
3. If abscess formation occurs, only attempt I&D in the tactical setting IF:
   A. The abscess is clearly well demarcated, superficial, or can be discerned by ultrasound.
   B. Local anesthesia is available.

SIGNS AND SYMPTOMS:
1. Painful, erythematous, swollen, tender area.
2. Fever may or may not be present.
3. Typically, erythema spreads without treatment.
4. Rapidly spreading and very painful infections suggest the possibility of necrotizing fasciitis, a life-threatening infection of the deeper tissues that should be treated per *Sepsis/ Septic Shock Protocol.*
5. Fluctuant, tender, well-defined mass indicates abscess formation.

MANAGEMENT:

1.  Moxifloxacin (Avelox) 400mg PO qd for 10 days **OR** Amoxicillin/Clavulanic Acid (Augmentin) 875mg PO bid.
2.  **PLUS EITHER** Trimethoprim-Sulfamethoxazole (Septra DS) 1 tab PO bid **OR** Rifampin (Rifadin) 600mg PO bid for 10 days.
3. Clean and dress wound and surrounding area.
4. Use a pen to mark the demarcation border of the infection and re-evaluate in 24 hours.
5. Limit activity until infection resolves.
6.  Add Ertapenem (Invanz) 1gm IV / IM qd if worsening at 24 hours or no improvement at 48 hours of treatment.
7. **IF ABSCESS IS PRESENT:**
   A. Incise and drain (I&D) if the environment permits:
      1) Establish sterile incision site with Betadine
      2)  Local anesthesia using Lidocaine
      3) Incise the length of the abscess cavity, but no further
      4) Incision should be parallel to skin tension lines if possible
      5) On initial treatment, leave wound open and pack with iodoform or dry sterile gauze, if available. On subsequent dressings, loosely pack the wound and leave gauze protruding to facilitate drainage (wick the wound). **DO NOT SUTURE THE SITE.**
   B. Bandage site and perform wound checks daily
8. Treat per *Pain Management Protocol.*

DISPOSITION:
1. Re-evaluate daily and watch for progression of erythema while on antibiotics.
2. Cellulitis in critical areas (head, neck, hand, joint involvement, perineal) requires *Priority* evacuation.
3. Use of IV antibiotics requires *Priority* evacuation.

CHEST PAIN

SPECIAL CONSIDERATIONS:
1. This Protocol assumes no access to ACLS medications or monitoring/ defibrillation equipment.
2. Since the ATP does not have access in the field to tests required to accurately determine the etiology of chest pain, early and rapid evacuation should be considered if tactically feasible. High risk etiologies include myocardial infarction (MI), unstable angina, pulmonary embolus, pericarditis, spontaneous pneumothorax, and esophageal rupture.

SIGNS AND SYMPTOMS - CARDIAC:
1. The presence of one or more of the following risk factors increases the likelihood of coronary artery disease: smoking, diabetes, hypertension, elevated cholesterol, obesity, family history of MI at a young age, and patient age over 40.
2. The following are signs and symptoms suspicious for myocardial infarction as the etiology for chest pain:
   A. Substernal chest pain that may radiate to the left arm, neck, or jaw
   B. Pain described as pressure or squeezing
   C. Pain exacerbated with exertion and relieved with rest
   D. Associated dyspnea, diaphoresis (sweating), nausea, lightheadedness, or syncope
   E. Tachycardia, irregular heart rhythm, or severe bradycardia
   F. Bilateral rales/ crackles in the lungs on auscultation
   G. Significant hypertension or hypotension

MANAGEMENT:
1.  Aspirin (ASA) 325mg PO (non-enteric coated) – chew to speed absorption.
2. IV access with saline lock. Administer 250–500cc normal saline boluses as needed to correct hypotension with frequent reassessment.
3.  Morphine sulfate 5mg IV initially, then 2mg q 10–15 min prn for pain unless hypotension is present. Maintain a minimum BP of 90mmHg systolic (palpable radial pulse).
4. Oxygen with pulse oximetry monitoring.
5. Avoid all exertion. Allow the patient to rest in a position of comfort. Frequently reassess the patient including hemodynamic status.

OTHER ETIOLOGIES OF CHEST PAIN:
1. The following signs and symptoms **MAY** suggest a GI etiology such as gastroesophageal reflux disease (GERD): dyspepsia, dysphagia, burning quality to chest pain, exacerbated by laying flat, foul or brackish taste in mouth. A trial of antacids or Ranitidine (Zantac) 150mg PO bid may be useful if evacuation will be delayed.
2.  Severe chest pain following forceful vomiting may indicate esophageal rupture. Administer IV normal saline 150cc/hr and Ertapenem (Invanz) 1gm IV and evacuate as *Urgent*.
3.  Sudden onset of pleuritic chest pain with dyspnea may indicate pulmonary embolus or spontaneous pneumothorax. Auscultate the lungs. Unilaterally diminished breath sounds suggest pneumothorax which may require decompression. Administer oxygen, establish IV access, administer Aspirin 325mg PO for suspected PE, and evacuate as *Urgent*.
4.  The following signs and symptoms **MAY** suggest a musculoskeletal etiology: pain isolated to a specific muscle or costochondral joint pain exacerbated with certain types of movements, non-central chest pain reproduced upon palpation. A trial of NSAIDs such as Ibuprofen (Motrin) 800mg PO tid may be useful if evacuation will be delayed.

5. Chest pain with gradual onset and exacerbated by deep inspiration and accompanied by fever and productive cough **MAY** indicate lower respiratory tract infection. Consider treatment per *Bronchitis/ Pneumonia Protocol*.

DISPOSITION:

1. *Urgent* evacuation.
2. Evacuation platform should include ACLS certified medical personnel and the equipment, supplies, and medications necessary for ACLS care.
3. Do not delay evacuation if unsure of chest pain etiology. Strongly consider early contact with a medical officer or medical treatment facility for consultation. Frequently reassess the patient suspected of a non-cardiac etiology to ensure stability and accuracy of the diagnosis.

COLD INJURY

SPECIAL CONSIDERATIONS:
1. Refreezing after thawing results in a high probability of amputation.
2. Check for 60 seconds for pulse and respirations due to bradycardia

SIGNS AND SYMPTOMS:
1. Hypothermia (Decreased core temperature)
   A. Mild – Shivering, poor co-ordination
   B. Moderate – Cessation of shivering, disorientation, slurred speech, confusion
   C. Severe - Unconscious
2. Freezing Cold Injury (Frostbite)
   A. Superfical – Skin is firm, but not hard; painful, red skin
   B. Deep – Painless, grey appearing skin. Skin is hard, white, grey, ashen, waxy in appearance
3. Non freezing cold injury
   A. Itching. Pale, cool, blotchy wet skin. Mild ulcerations may be present. Numbness and tingling sensations

MANAGEMENT:
1. Non freezing cold injury;
   A. Gently dry, do not rub involved area. Elevate feet, warm torso, hydrate orally, dry socks. NSAIDS may help. Evacuation depends on ambulatory ability.
2. Freezing Cold Injury
   A. Do not walk on frozen feet / toes unless necessary for preservation of life
   B. Do not rub with snow/ice
   C. Do not vigorously massage tissue
   D. Do not use space heaters or dry heat sources (fire, MRE heaters, hand-warmers, etc)
   E. Ibuprofen, 800mg PO tid (Consider other NSAIDs if ibuprofen is not available)
   F. If thawed, refreezing will most likely result in amputation
   G. Once thawing has occurred, expect intense pain requiring narcotic use. Follow *Pain Management Protocol*
   H. If refreezing likely:
      1) Do not attempt to thaw frostbitten tissue
      2) Protect tissue from further injury by wrapping with dry Kerlix
         a. Separate digits with dressing
   I. Refreezing not likely:
      1) Superficial
         a. Warm water immersion
         b. Warm extremity in axilla or groin
         c. Drainage of clear blisters may be considered
         d. Apply soft kerlix type dressing
      2) Deep
         a. Warm water immersion (104-108°) until tissue is soft (approximately 30 minutes)
         b. Apply loose dry dressing prior to transport
         c. Pain Management per *Pain Management protocol*
         d. Do not drain hemorrhagic blisters
3. Hypothermia
   A. Move to warm environment, remove any wet clothing and begin rewarming (Blizzard Blanket, Ranger Rescue Wrap, etc.)
   B. Shield from wind
   C. If able to tolerate PO, provide food and hydrate patient
   D. Mild: exercise in place
   E. Moderate / Severe:
      1) Do not exercise patient. Maintain supine position on insulation
      2) Do not give patients food or oral fluids
      3) If IV fluids are indicated, administer glucose containing IV fluids warmed to 40°C (101.6°F) or 1 amp of D50

4) Begin active rewarming (Blizzard Blanket, Ranger Rescue Wrap, etc.)
5) If unconscious:
   a. Avoid sudden movements and rough handling due to increased ventricular fibrillation risk
   b. Assure airway patency
   c. Check for 60 seconds for pulse and respirations due to bradycardia
   d. If not breathing, begin ventilations
   e. If no pulse, begin chest compressions only if patient will not arrive in medical facility in 3 hours.

References:
State of Alaska Cold Injury Guidelines, 2003, www.chems.alaska.gov
SOF Medical Handbook, 2009

DISPOSITION:
1. *Urgent* evacuation for moderate/ severe hypothermia cases to a facility capable of active rewarming and resuscitation.
2. *Priority* evacuation for cases of freezing cold injuries (frostbite).
3. *Routine* evacuation for cases of non freezing cold injury which are non ambulatory.
4. Evacuation not necessary for cases of non freezing ambulatory cold injuries

CONSTIPATION/ FECAL IMPACTION

SPECIAL CONSIDERATIONS:

1. Differential diagnosis includes acute appendicitis, volvulus, ruptured diverticulum, bowel obstruction, pancreatitis, or parasitic infections.
2. Acute onset, severe pain, point tenderness, and fever indicate etiologies other than constipation or fecal impaction.

SIGNS AND SYMPTOMS:

1. Recent history of infrequent passage of hard, dry stools or straining during defecation.
2. Abdominal pain, which is typically poorly localized with cramping.
3. If pain becomes severe and is associated with nausea / vomiting and complete lack of flatus or stools, consider a bowel obstruction.

MANAGEMENT:

1.  Bisacodyl (Dulcolax) 10mg PO tid prn
2. Avoid narcotics as this will exacerbate the constipation.
3. For impacted stool or no relief with above measures, give normal saline enema 500ml via lubricated IV tubing. (Pt should retain solution for two minutes before evacuating contents)
4. If above measures fail, perform digital rectal examination to check for fecal impaction. If fecal impaction is present, perform digital disimpaction, if trained.
5. Increase PO fluid intake.
6. Increase fiber (fruits, bran, and vegetables) in diet if possible.
7. If severe pain, rigid board-like abdomen, fever, and/ or rebound tenderness develop, or moderate to large amounts of blood are present in the stool, then treat per *Abdominal Pain Protocol*.

DISPOSITION:

1. Evacuation is usually not required for this condition.
2. *Routine* evacuation if no response to therapy.

CONTACT DERMATITIS

SPECIAL CONSIDERATIONS:

1. Insect bite(s) as a differential diagnosis - also accompanied by itching, but with discrete red papular lesions(s).
2. Cellulitis as a differential diagnosis - bright red, painful, non-pruritic, and typically becomes steadily worse without antibiotics.
3. Fungal infection as a differential diagnosis – not always pruritic; infection site(s) slowly enlarge without therapy.
4. Effects are particularly dangerous if contact in or around the eyes.

SIGNS AND SYMPTOMS:

1. Acute onset
2. Skin erythema
3. Intense itching (pruritis)
4. Edema, papules, vesicles, bullae, discharge, and / or crusting may be visible.

Management:

1. Change clothes when possible and bag original clothes until they can be machine washed.
2. Wash area with mild soap and water.
3. Apply cold wet compress to affected area to help decrease itching.
4.  If available, apply 1% hydrocortisone cream to the affected area and cover with a dry dressing to help prevent spread to other parts of the body or clothing.
5.  In severe cases, Dexamethasone (Decadron) 10mg IM / PO qd for 5 days.
   A. **IF POISON IVY, OR OTHER PLANT-ASSOCIATED DERMATITIS IS SUSPECTED, TAPER DOSE OVER 14 DAYS (10MG FOR 5 DAYS, 8MG FOR 2 DAYS, ETC)**
6.  Give Diphenhydramine (Benadryl) 25–50mg PO q 6hr prn itching, if tactically feasible. (Sedation may occur)

DISPOSITION:

1. Evacuation not needed for mild cases.
2. *Priority* evacuation for severe symptoms: intra-oral, eye involvement, or >50% body surface area (BSA) involvement.
3. Monitor for secondary infection; treat per *Cellulitis* Protocol if suspected on the basis of increasing pain, redness, or purulent crusting.

CORNEAL ABRASIONS/ CORNEAL ULCERS/ CONJUNCTIVITIS

SPECIAL CONSIDERATIONS:
1. Contact lens corneal abrasions are at a high risk for development of a corneal ulcer. They should not be patched and require more intensive antibiotic therapy.
2. Consider LASIK Flap dislocation for anyone that sustains eye trauma after LASIK surgery.

SIGNS AND SYMPTOMS:
1. History of eye trauma or contact lens wear
2. Eye pain – typically becoming worse over several days
3. Eye redness
4. Tearing
5. Blurred vision
6. Light sensitivity
7. Fluorescein stain positive
8. White or gray spot on cornea for corneal ulcer (usually need tangential penlight exam to see)
9. For sudden onset of eye pain after trauma in a patient with LASIK surgery, consider LASIK flap dislocation

MANAGEMENT:
1. Remove contact lens if worn.
2.  Tetracaine 0.5%, 2 drops in the affected eye for pain relief. Do not dispense to patient.
3. Check for foreign body to include eyelid eversion. Irrigate with normal saline prn.
4.  Gatifloxacin (Zymar) 0.3% drops – 1 drop in the affected eye qid while awake.
5. Treat per *Pain Management Protocol.*
6. Reduce light exposure, stay indoors if possible - sunglasses if not possible.
7. For corneal abrasions: monitor daily for worsening signs and symptoms of a corneal ulcer (increasing pain and development of a white or grey spot at abrasion site). **DO NOT PATCH.**
8. Assess using fluorescein drops daily — abrasions should get progressively smaller. Continue antibiotic drops until 24 hours after cornea becomes fluorescein negative (no bright yellow spot).
9. **IF CORNEAL ULCER PRESENTS**: Increase Gatifloxacin (Zymar) drops to q 2hr and *Priority* evacuation.

DISPOSITION:
1. Evacuation may not be needed for corneal abrasion if improving with treatment.
2. *Urgent* evacuation for LASIK flap dislocation
3. *Priority* evacuation for Corneal Ulcer

COUGH

SPECIAL CONSIDERATIONS:
Usually viral etiology, but may also occur with high altitude pulmonary edema (HAPE) and pneumonia.

SIGNS AND SYMPTOMS:
1. Cough with or without scant sputum production
2. Often accompanied by other signs and symptoms of upper respiratory tract infection (i.e., sore throat and rhinorrhea).

MANAGEMENT:
1. Treat symptomatically (using Cepacol lozenges or other appropriate medications) when the findings on history and physical do not suggest pneumonia.
2.  Albuterol (Ventolin) metered dose inhaler 3–4 puffs q 4hr may also help control coughing.
3. Encourage PO hydration.
4. Avoid respiratory irritants (smoke, aerosols, etc).
5. If associated with URI symptoms, treat per *Allergic Rhinitis Protocol*.
6. If at altitude, pull balaclava over nose and breathe through it for warm humidified air.

DISPOSITION:
1. Evacuation is usually not required.
2. If accompanied by fever, chest pain, dyspnea, and / or colored sputum (green, dark yellow, or red-tinged), treat per *Bronchitis/ Pneumonia* Protocol.

DEEP VENOUS THROMBOSIS (DVT)

SPECIAL CONSIDERATIONS:
1. Risk factors include trauma, long airplane rides, high altitude exposure, and genetic predisposition.
2. May be confused with a ruptured Baker's cyst in a tactical setting.

SIGNS AND SYMPTOMS:
1. Asymmetric pain and swelling in a lower extremity (often the calf muscles).
2. Warmth over affected area.
3. Increased pain in the affected calf muscles with dorsiflexion of the foot (Homans' Sign).

MANAGEMENT:
1. Monitor patient with pulse oximetry (sudden decrease in oxygen saturation suggests a pulmonary embolism.)
2.  ASA 325mg PO
3. If sudden chest pain or respiratory distress occurs, consider pulmonary embolus and administer oxygen if available.
4. Immobilize the affected extremity.

DISPOSITION:
1. *Priority* evacuation if no respiratory distress or chest pain.
2. *Urgent* evacuation if respiratory distress or chest pain are present

DEHYDRATION

SPECIAL CONSIDERATIONS:
1. Troops in the field are often chronically dehydrated.
2. Prolonged missions, acute diarrhea (gastroenteritis), viral / bacterial infections, and environmental factors (heat stress or strenuous activity) all may exacerbate dehydration.
3. May also occur in cold or high altitude environments.

SIGNS AND SYMPTOMS:
1. Lightheadedness (worse with sudden standing)
2. Mild headache (especially in the morning)
3. Dry mucosa
4. Decreased urinary frequency and volume
5. Dark urine
6. Degradation in performance

MANAGEMENT:
1. Increase oral fluids if tolerated.
   A. If available, use carbohydrate/ electrolyte drink mixes for fluid replacement diluted to a 1:4 solution.
   B. Avoid fluids containing caffeine.

2. If unable to tolerate PO fluids, use an initial bolus of 1 liter normal saline IV, followed by repeat attempt at PO hydration. If still unable to tolerate PO hydration, repeat 1 liter bolus of normal saline IV. If normal saline is not available, use available IV fluids.

DISPOSITION:
1. Monitor closely for recurrence of dehydration.
2. *Priority* evacuation if dehydration persists after treatment.

DENTAL PAIN

SPECIAL CONSIDERATIONS:
1. Most common causes are deep decay, fractures of tooth crown/root, acute periapical (root end) abscesses, or pericornitis (pain associated with an impacted wisdom tooth).
2. If tooth pain occurs during flight, consider barodontalgia and refer to the *Barotrauma Protocol*

SIGNS AND SYMPTOMS:
1. Intermittent or continuous pain (usually intense), heat or cold sensitivity
2. Visibly broken / cracked tooth
3. Severe pain on percussion
4. Intraoral swelling / abscess
5. Partially erupted wisdom tooth
6. Lost filling

MANAGEMENT:
1. Treat per *Pain Management Protocol*.
2.  If signs and symptoms of infection are present, administer Amoxicillin/Clavulanic Acid (Augmentin) 875mg PO bid for 7 days **OR** Azithromycin. (Z-pak) 500mg PO initially followed by 250mg PO qd x 4 days.
3. If gums appear swollen and red, encourage increased oral hygiene and warm saline rinses bid.
4. If filling is lost, consider temporary filling/patch.

DISPOSITION
1. Evacuation usually not necessary.
2. *Routine* evacuation if not responding to therapy.

DETERMINATION OF DEATH / DISCONTINUING RESUSCITATION

SPECIAL CONSIDERATIONS:

1. Immediate determination of death is appropriate in a trauma patient without pulse or respirations in the setting of multiple casualties when resuscitative efforts would hinder the care of more viable patients.
2. Patients that are struck by lightening, have hypothermia, cold-water drowning; or intermittent pulses may require extended cardiopulmonary resuscitation
3. It is assumed that personnel do not have access to ECG, or other monitoring equipment to evaluate heart rhythm, or deliver countershocks.

SIGNS AND SYMPTOMS:

1. Obvious Death - Persons who, in addition to absence of respiration, cardiac activity, and neurologic reflexes have one or more of the following:
   A. Decapitation
   B. Massive crushing and / or penetrating injury with evisceration of the heart, lung or brain
   C. Incineration
   D. Decomposition of body tissue
   E. Rigor mortis or post-mortem lividity

MANAGEMENT:

1. In the setting of obvious death, resuscitative efforts should not be initiated.

2. If resuscitative efforts have been initiated, consider termination of resuscitation:
   A. After 15 minutes (if the cause is unknown or due to trauma) or after 30 minutes (when the cause is due to hypothermia, electrical injury, lightning strike, cold water drowning, or other cause known to require a prolonged resuscitative effort) when:
      1) There is persistent absence of pulse and respirations despite assuring airway patency and effective ventilation as well as administration of resuscitative fluids and medications.
      2) Pupils are fixed and dilated. This is not applicable in the setting of lightning strikes or in the presence of drugs that cause pupil dilatation.
      3) No response to deep pain above or below the clavicles
      4) Absence of end-tidal CO_2, (either colorimetric or wave form) from a correctly placed endotracheal tube or alternative airway.
      5) Absence of cardiac activity on ultrasound examination.

3. If there is any question as to the discontinuation of resuscitative efforts, then a medical officer should be contacted for guidance.

DISPOSITION:

1. Evacuation of the remains when tactically feasible.
2. In the event of return of spontaneous circulation, *Urgent* Evacuation.

EAR INFECTION (INCLUDES OTITIS MEDIA AND OTITIS EXTERNA)

SPECIAL CONSIDERATIONS:
1. Infection of the middle or external ear may be viral or bacterial in etiology.
2. Increased pressure in the middle ear may cause intense pain and may result in rupture of the tympanic membrane (characterized by sudden decrease in pain and drainage from ear canal.)

SIGNS AND SYMPTOMS:
1. Otitis Media
   A. Ear pain
   B. Decreased hearing
   C. Inflamed, bulging ear drum on otoscope exam
2. Otitis Externa
   A. Ear canal drainage
   B. Pain on motion of tragus (outer ear)
   C. Cracked, red, inflamed external auditory canal

MANAGEMENT:
1. **OTITIS MEDIA**

   A.  Moxifloxacin (Avelox) 400mg PO qd for 10 days **OR** Azitomycin. (Z-pac) 500mg PO initially followed by 250mg PO qd x 4 days.

2. **OTITIS EXTERNA**

3. A.  Gatifloxacin (Zymar) drops; 5 drops tid – qid until symptoms remain resolved for 48 hours.

4. Treat per *Pain Management Protocol*

5.  If water immersion is anticipated, use ear plugs to prevent cold water entry which will cause vertigo.

DISPOSITION:
1. For uncomplicated cases, no evacuation is necessary.
2. *Routine* evacuation for complicated cases not responding to therapy

ENVENOMATION

SNAKE ENVENOMATIONS

SPECIAL CONSIDERATIONS - GENERAL:

1. Toxic envenomations from a variety of sources, including insects, spiders, bees/wasps, scorpions, snakes, or marine life are all capable of causing life-threatening anaphylaxis and should be treated according to the *Anaphylaxis* Protocol.

SPECIAL CONSIDERATIONS - SNAKES:

1. Only a minority of snakebites from toxic snakes involve severe, life-threatening envenomations.
2. Incision, excision, electrical shock, tourniquet, oral suction, and cryotherapy should **NOT** be performed to treat snakebites.
3. Suction device is not effective for removing snake venom from a wound. If previously placed, it should be left in place until patient reaches higher level of care.

SNAKE SIGNS AND SYMPTOMS:

1. Crotalidae (Pit vipers, rattlesnake, moccasin, bush master)
   A. Sudden pain
   B. Erythema
   C. Ecchymosis
   D. Hemorrhagic bullae
   E. Bleeding from site
   F. Metallic taste
   G. Hypotension/ shock
   H. Swelling/edema
2. Elapids (Coral snake, sea snake, mamba, cobra, taipan, kraits)
   A. Cranial Nerve dysfunction (i.e., ptosis, difficulty swallowing)
   B. Paresthesias
   C. Fasciculations
   D. Weakness
   E. Altered mental status

MANAGEMENT OF SNAKE BITES:

1. If signs and symptoms of anaphylaxis present, treat per *Anaphylaxis Protocol.*
2. Supportive care as necessary
3. Treat per *Pain Management Protocol using narcotics. Avoid NSAID use.*
4. Treat per *Nausea and Vomiting Protocol.*
5. If toxic snakebite suspected (significant pain, edema, evidence of coagulopathy or neurologic signs/symptoms):
   A. Minimize activity and place on a litter
   B. Remove all constricting clothing and jewelry
   C. Start IV in unaffected extremity
   D. Monitor and record vital signs and extent of edema every 15–30 minutes
   E. IV crystalloid for hypotension as necessary
   F. Immobilize affected limb in neutral position
   G. A compression wrap (proximal to distal) may be helpful with an elapidae (neurotoxic) snake (cobra, mamba, coral snake), but is not indicated with crotalidae (pit viper) bites.

H. 

The need for a fasciotomy is difficult to determine in a snake bite unless compartment pressures have been taken.

I. 

Cold therapy and suction therapy is contraindicated in snakebites.

DISPOSITION:
1. *Urgent* evacuation if treated for anaphylaxis.
2. *Urgent* evacuation for elapidae bites or if evidence of severe envenomation (systemic signs and symptoms, progressive ascending edema) exists.
3. Evacuation not required for crotalidae bites if signs and symptoms do not indicate anaphylaxis or development of severe envenomation after four hours of observation.

MARINE ENVENOMATIONS

SPECIAL CONSIDERATIONS:
1. Envenomation results from stings by jellyfish, fire corals, sting rays, sea urchins, bristle worms, fish spines, sea snakes, etc.
2. Jellyfish account for the vast majority of envenomations, which occur with contact to stinging cells on tentacles.
3. Stingrays are the most common cause of envenomation by marine vertebrates.
4. Sea snake venom is 2-10 times more potent than cobra venom, but only about 25% of those bitten develop symptoms (due to an inefficient delivery system and small mouth)
5. All of these envenomations are more likely to occur in intratidal regions, reefs and surf zones

SIGNS AND SYMPTOMS:
1. Envenomation by jellyfish:
   A. Contact with jellyfish tentacles causes immediate, intense sharp and burning pain, followed by local, linear erythematous eruption.
   B. Severe stings can cause anaphylactic reaction, hematuria, vomiting, syncope, hypotension, or paralysis.
2. Envenomation by fire coral is similar to jellyfish, but less severe and rarely causes complications. Pain symptoms usually resolve within 12 hours.
3. Envenomation by stingray:
   A. Spine on tail contains retro-serrated teeth, with a venom gland along the groove.
   B. Envenomation causes immediate, intense pain at site of injury out of proportion to what it looks like, edema.
   C. Pain tends to peak 30-60 minutes after puncture and can last for several days.
   D. Rare systemic symptoms include limb paralysis, hypotension, and bradycardia.
4. Envenomation by sea urchin:
   A. Frequently cause multiple deep puncture wounds when stepped on.
   B. Puncture and envenomation causes immediate, intense pain, erythema and local swelling.
   C. If more than 15-20 punctures are present then severe systemic symptoms can occur.
5. Envenomation by bristleworms:
   A. Is caused by contact with bristle-like setae on feet of animal.
   B. Contact is like brushing against a cactus plant and may result in many fine bristles embedded in the skin.
   C. Causes painful inflammation, which is almost never serious.
6. Envenomation by fish spines:
   A. First symptom is usually immediate localized pain out of proportion to clinical manifestations, lasting minutes to hours.
   B. Puncture wound is usually cyanotic, with surrounding erythema and edema

C. Pain is often noted in proximal lymph nodes.
D. Symptoms can progress to delirium, malaise, nausea, vomiting, and elevated temperature.
E. Infrequently leads to shock and death.

7. Envenomation by sea snake bites:
   A. Fang and teeth marks consist of small puncture wounds and may number from 1–20.
   B. Latent period of 10 minutes to several hours between bite and onset of symptoms.
   C. May initially present with mental status changes, including euphoria, anxiety or restlessness.
   D. Progresses to dry throat, nausea, vomiting, generalized weakness and paralysis, leading to respiratory distress/failure.
8. Envenomation by blue-ringed octopus bite:
   A. Bite is painless and may go unnoticed.
   B. Patient may become paralyzed with respiratory distress.
   C. Symptoms are usually rapid in onset and extremely variable in severity.

MANAGEMENT:
1. Stings (Jellyfish, Sea Wasp)
   A. Remove stinger, tentacles, etc if possible with gloved hand, forceps or tape.
   B. Immediately flush with dilute acetic acid (vinegar). Alternative flush is isopropyl alcohol and seawater. Do not use fresh water.
   C. Topical lidocaine
   D. Topical steroids
   E. Follow *Pain Management Protocol*

2. Bites (Sea snakes, blue ringed octopus) – See *Envenomation Protocol*

3. Punctures (Sea urchin, stingray, fish spines, bristleworms)
   A. Remove all penetrating foreign bodies with gloved hand, forceps or tape.
   B. Irrigation with cold seawater.
   C. Soak the affected area in nonscalding water (110–115^{o}) for 30-90 minutes to inactivate toxins
   D. Ultrasound or xray (if available for retained foreign body)
   E. Antibiotics for deep puncture wounds: Moxifloxacin.
   F. Follow *Pain Management Protocol*

DISPOSITION:
1. *Urgent* evacuation if evidence of severe envenomation (cardiovascular collapse, anaphylaxis, paralysis, ascending edema of limb)
2. Evacuation not required if signs and symptoms do not indicate severe envenomation after 24 hours of observation.

INSECT / ARTHROPOD ENVENOMATIONS

SPECIAL CONSIDERATIONS – Insect / Arthropod Bite:
1. In cases of suspected black widow spider bites, consider other causes for acute abdominal pain

HYMENOPTERA (BEE, WASP, HORNET)
SIGNS AND SYMPTOMS:
1. Pain
2. Swelling / edema
3. Puncture site(s) from stinger or fangs
4. Warmth
5. Erythema

6. Signs of anaphylaxis

MANAGEMENT:

1. If signs and symptoms of anaphylaxis present, treat per *Anaphylaxis Protocol.*
2. Remove stinger by scraping from side.
3. Apply ice or cold water.
4.  Apply topical 1% hydrocortisone cream.
5.  Apply topical lidocaine.
6.  Ibuprofen 800mg PO tid x 7 days
7.  Diphenhydramine (Benadryl) 25–50mg q 6hr prn PO / IV.

ARTHROPOD (Spider)

1. Black Widow
   A. **SIGNS AND SYMPTOMS:**
      1) Pinching bite followed by local swelling and burning
      2) Large muscle group spasms/tremors
      3) Abdominal pain and/or rigidity within 60 minutes
      4) Nausea and vomiting
      5) Diaphoresis
      6) Hypertension
      7) Tachycardia

   B. **MANAGEMENT:**
      1) Treat per *Pain Management Protocol (narcotic analgesia)*
      2)  Diazepam (Valium) 2-10mg PO q 6-8hr or 5-10mg IV/IM for relief of muscle spasm
      3)  Diphenhydramine (Benadryl) 25–50mg q 6hr prn PO / IV.

2. Brown Recluse
   A. **SIGNS AND SYMPTOMS:**
      1) Local pain and ulceration at site within 2-8 hours with surrounding erythema
      2) Hemorrhagic vesicle progressing to slowly enlarging eschar
      3) Fever, chills, nausea, joint pain

   B. **MANAGEMENT:**
      1) Elevate bite site
      2) Avoid strenuous activity
      3) Treat per *Pain Management Protocol (narcotic analgesia)*
      4)  Diphenhydramine (Benadryl) 25–50mg q 6hr prn PO / IV.
      5)  Use an antibiotic appropriate for MRSA if cellulitis exists.

SCORPION

SIGNS AND SYMPTOMS:

1. Local pain, swelling, and erythema
2. Nausea and vomiting
3. Paresthesias
4. Tongue fasiculations
5. Sympathetic (tachycardia, hypertension, hyperthermia) or parasympathetic (hypotension, bradycardia, hypersalivation, incontinence) overdrive at develop
6. Seizures
7. Agitation
8. Blurry vision/Rotary eye movements

MANAGEMENT:

1. Treat per *Pain Management Protocol*
2. Treat per *Nausea and Vomiting Protocol*
3. Apply ice packs to bite site
4. Supportive care as necessary
5.  Diphenhydramine (Benadryl) 25–50mg q 6hr prn PO / IV.

DISPOSITION

1. *Urgent* evacuation for development of abdominal rigidity
2. *Urgent* evacuation for development of systemic signs.
3. *Urgent* evacuation for anaphylaxis
4. *Routine* evacuation for tissue necrosis of brown recluse bite
5. Evacuation typically not required for localized insect stings and scorpion bites.

EPISTAXIS

SPECIAL CONSIDERATIONS:
1. Common at high altitude and in desert environments due to mucosal drying.
2. May be anterior or posterior
3. Posterior epistaxis may be difficult to stop and may cause respiratory distress due to blood flowing into the airway. This type of epistaxis is uncommon in young healthy adults. It is more commonly seen in older, hypertensive patients.

SIGNS AND SYMPTOMS:
1. Nosebleed
2. Often previous history of nosebleeds

MANAGEMENT:
1. Clear clots and other material from airway (if required) by having patient sit up, lean forward, and blow his/her nose.
2.  Oxymetazoline (Afrin) nasal spray 2 squirts in each nostril then pinch anterior area of nose firmly for full 10 minutes **WITHOUT RELEASING PRESSURE.**
3.  If bleeding continues, insert Afrin-soaked nasal sponge bilaterally along floor of nasal cavity. Continue pinching the nose just below the nasal bridge, for 10 minutes.
4.  Once bleeding has stopped (after 30 minutes), remove the Afrin nasal sponge and apply Bactroban to the affected nostril bid – tid.
5. Normal saline IV TKO prn (based upon severity of nose bleed)
6. **IF BLEEDING CONTINUES**
   A. Prepare 14 French Foley catheter. (Tip is cut to minimize distal irritation.)
   B. Advance catheter along floor of nose (straight in) until visible in mouth.
   C. Fill balloon with 5cc of normal saline.
   D. Retract catheter until well opposed to posterior nasopharynx.
   E. Add an additional 5cc of normal saline to balloon.
   F. Clamp in place without using excessive anterior pressure.
   G.  Moxifloxacin (Avelox) 400mg PO qd until packing is removed.
   H. **LEAVE BALLOON AND PACKING IN PLACE FOR 72 HOURS.**

DISPOSITION:
1. *Priority* evacuation for severe epistaxis not responding to therapy or if Foley catheter is used.
2. Evacuation may not be required if epistaxis is mild, anterior, and resolves with treatment

FLANK PAIN
(INCLUDES RENAL COLIC, PYELONEPHRITIS, KIDNEY STONES)

SPECIAL CONSIDERATIONS:
1. May proceed to life-threatening systemic infection.
2. May be associated with testicular torsion. Ensure normal external GU exam first.

SIGNS AND SYMPTOMS:
1. Urinary Tract Infection
   A. Dysuria
   B. Polyuria
2. Back pain
3. Flank pain
4. Nausea/ vomiting
5. Costovertebral angle tenderness
6. Fever
7. Hematuria

MANAGEMENT:
1. Treat per *Pain Management Protocol.*
2. Treat per *Nausea and Vomiting Protocol.*
3. Treat per *Dehydration Protocol.*
4. If fever present:
   A.  Moxifloxacin (Avelox) 400mg PO qd **OR** Amoxicillin/Clavulanic Acid (Augmentin) 875mg PO bid
   B.  Ceftriaxone (Rocephin) 1gm bid IV / IM **OR** Ertapenem (Invanz) 1gm IV / IM if unable to tolerate PO or unresponsive to oral treatment.

DISPOSITION:
Priority evacuation for persistent flank pain and/or fever

FUNGAL SKIN INFECTION

SPECIAL CONSIDERATIONS:

1. Insect bite(s), eczema, and contact dermatitis as differential diagnosis – are also accompanied by itching, but have discrete red papular lesion(s).
2. Cellulitis as a differential diagnosis – is bright red, painful, not pruritic, and typically becomes steadily worse without antibiotics.
3. Acute contact dermatitis as a differential diagnosis – is diagnosed by intense itching, skin erythema and a history of environmental exposure.

SIGNS AND SYMPTOMS:

1. Skin erythema
2. Pruritis is variable
3. Slow spreading
4. Borders of the erythematous plaques are generally irregular and / or circumscribed.
5. Often initially diagnosed as contact dermatitis but gets worse with use of steroids (those without antifungal agent added).
6. Most common sites of infection are feet. ("athlete's foot" or tinea pedis), groin ("jock itch" or tinea cruris), scalp (tinea capitus), and torso or extremities ("ring worm" or tinea corporis).

MANAGEMENT:

1.  Fluconazole (Diflucan) 150mg PO once per week for four weeks (total of four doses in the absence of a cure, or 1 dose after clinically clear). If not resolved after 4 weeks, refer to physician.

2. Clean rigorously with mild soap without injuring the skin.

DISPOSITION
Evacuation is usually not required for this condition.

GASTROENTERITIS

SPECIAL CONSIDERATIONS:

1. Etiology of acute diarrhea is often viral, but bacterial or parasitic infections are common in the deployed environment.
2. Emerging fluoroquinolone resistance among enteropathogenic E. Coli and Campylobacter makes azithromycin the new primary agent for therapy.
3. Consider antibiotic-related diarrhea if on antibiotics at onset.
4. Consider parasitic infection if symptoms persist for 3 or more days.
5. Must rule out malaria if fever and GI symptoms exist in a malarious area.

SIGNS AND SYMPTOMS:

1. Acute onset of nausea, vomiting, and diarrhea
2. Fever may or may not be present.

MANAGEMENT:

1. Loperamide (Imodium) 4mg PO initially, then 2mg PO after every loose bowel movement with a maximum dose of 16mg per day.
2. Do not use loperamide in the presence of fever or bloody stools.
3. Azithromycin (Zithromax) 500mg PO qd for 3 days or Moxifloxacin (Avelox) 400mg PO qd for 3 days.
4. Treat per *Nausea and Vomiting Protocol*.
5. Treat per *Dehydration* Protocol.
6. If diarrhea persists after 3 days of therapy, or diarrhea develops while already on antibiotics, give Metronidazole (Flagyl) 500mg PO tid for 10 days.

DISPOSITION:

1. *Urgent* evacuation if grossly bloody stools or circulatory compromise
2. *Priority* evacuation if dehydration occurs despite above therapy.
3. *Routine* evacuation if diarrhea develops while already on antibiotics.

HEADACHE

SPECIAL CONSIDERATIONS:

1. The number of differential diagnoses for the acute headache is large and includes disorders that encompass the spectrum of minor to severe underlying disorders.
2. Consider altitude sickness, intracranial bleeds, meningitis and carbon monoxide poisoning.

SIGNS AND SYMPTOMS:

1. If the headache is atypical for the patient, check for elevated blood pressure (if possible), fever, neck rigidity, visual symptoms, mental status changes, motor-sensory deficits, and hydration.

MANAGEMENT:

1. If the patient has fever, nuchal rigidity, photophobia, petechial rash, or nausea and vomiting, treat per *Meningitis Protocol.*
2. Treat per *Pain Management Protocol (to exclude use of narcotics).*
3. If headache is accompanied by nausea and / or vomiting, treat per *Nausea and Vomiting Protocol.*
4. Oxygen if other therapies are ineffective.
5. If dehydration is suspected, treat per *Dehydration Protocol.*
6. If at altitude, treat per *Altitude Illness Protocol.*

DISPOSITION:

1. Evacuation is usually not required if the headache responds to therapy.
2. Acute headache in the presence of fever, severe nausea and vomiting, mental status changes, focal neurological signs, or preceding seizures, loss of consciousness, or a history of "it's the worst headache in my life" constitutes a true emergency and requires *Urgent* evacuation. Also consider *Urgent* evacuation for anyone without a prior history of headaches if their pain is severe.

HEAD AND NECK INFECTION
(INCLUDES EPIGLOTTITIS AND PERITONSILLAR ABSCESS)

SPECIAL CONSIDERATIONS:
1. Most common causes in young healthy patients include odontogenic (dental origin) cutaneous sources or post-injury (wound or fracture) infections.
2. These infections may progress rapidly from minor to airway/life-threatening.

SIGNS AND SYMPTOMS:
1. Pain, fever and malaise
2. Intra/extra oral swelling
3. Difficulty opening mouth
4. Pus
5. Difficulty swallowing
6. Airway compromise

MANAGEMENT:
1. Manage airway and breathing first!
2. Place patient in position of comfort.
3. Monitor pulse oximetry.
4. Oxygen prn
5. IV access
6.  Amoxicillin/Clavulanic Acid (Augmentin) 875mg PO bid for 7 days **OR** Ceftriaxone (Rocephin) 1gm IV / IM qd for 7 days.
7. Treat per *Pain Management Protocol*.
8.  Consider Dexamethasone (Decadron) 10mg IV for any airway involvement.
9. **Avoid airway manipulation unless absolutely necessary**.
10.  Have cricothyroidotomy kit available **BEFORE ATTEMPTING INTUBATION**.
11. If airway intervention is indicated, make a single attempt at intubation if feasible.
12. If intubation is attempted, do not make any repeat attempts. If intubation has failed, the next step is a cricothyroidotomy (using lidocaine if conscious)

DISPOSITION
1. *Urgent* evacuation if any airway compromise is present.
2. *Routine* evacuation if no airway compromise and the infection is not widespread.

HEAT ILLNESS

SPECIAL CONSIDERATIONS:
1. Dehydration often accompanies heat illness
2. Colloids (Hextend) should be avoided in favor of crystalloids.
3. Heat Stroke is a life-threatening effect of hyperthermia and characterized by altered mental status and elevated core temperature typically > 104° F.
4. Patients are at risk for multisystem organ failure, and careful monitoring is essential even after return to normothermia.

SIGNS AND SYMPTOMS:
1. Generally involve physical collapse or debilitation during or immediately following exertion in the heat.
2. Heat Exhaustion: Temp generally ≤ 104° F, headache, dizziness, nausea, tachycardia, and normal mental status
3. Heat Stroke: Temp generally > 104° F, above symptoms and altered mental status (delirium, stupor, coma)

MANAGEMENT:

1. **Early rapid cooling reduces mortality and morbidity, and should be initiated as soon as possible.** Cooling should be the primary goal before transport.

2. Place in cool area and remove clothing.
   A. For Heat Stroke: The best option for rapid cooling is full body ice water immersion (keeping head elevated out of water). If this is unavailable, a continual dousing of cold water (as would occur in a cold shower or with ice water-soaked towels) provides the fastest cooling rate. A less ideal option is to spray the patient with water plus rapid air movement provided by a fan. Apply these active cooling measures until the core temperature reaches 102° F.

3. Place 1 tube Glutose (oral glucose gel) or 1 packet of sugar in buccal mucosal region.
4. Treat per *Dehydration Protocol*. Heat stroke and heat exhaustion with associated severe muscle pain and/or cola colored urine, will typically require 2-3 liters of crystalloid and continued IV hydration to obtain a urine output of 200mL/hr.
   A. If the patient is unconscious after exercising on a hot day, and you do not have a core temperature available, limit fluid resuscitation to 1000 cc of crystalloid unless hemodynamically unstable.
5. Treat per *Nausea and Vomiting Protocol*.

6. For cola colored urine or severe muscle pain, treat per *Rhabdomyolysis Protocol*

DISPOSITION:
1. *Urgent* evacuation for Heat Stroke
2. *Routine* evacuation for Heat Exhaustion

HIV POST EXPOSURE PROPHYLAXIS

SPECIAL CONSIDERATIONS:

1. Initiation of the highly active antiretroviral therapy (HAART) should ideally occur within 2 hours of exposure, but still has some effect up to 72 hours after exposure.
2. Antiretrovirals have a significant side-effect profile, including nausea, vomiting, and diarrhea.
3. Obtain a sample of the source's blood for HIV and hepatitis testing, if possible.
4. Use of a commercially available Rapid HIV Test Kit that uses either an oral specimen or whole blood is recommended for source testing to determine if HAART therapy should be initiated. This should occur within 1-2 hours. The test requires 20-40 minutes to obtain results. The use of one of the following FDA approved Rapid HIV Test kits is recommended (as of 2009):
   A. whole blood, plasma or oral fluid:
      1) OraQuick Advance Rapid HIV 1/2 Antibody Test
   B. whole blood or serum/plasma:
      1) Uni-Gold Recombigen HIV Test
      2) Clearview HIV 1/2 Stat-Pak
      3) Clearview Complete HIV 1/2 Test

HIGH RISK EXPOSURES:

1. Percutaneous injury (needle stick or other contaminated penetrating injury).
2. Exposure or exchange of body fluids with persons at high risk for HIV.
3. Transfusion of blood products that have not undergone standard U.S. blood bank or equivalent testing for transmissible diseases.
4. 

When attempting to evaluate a high risk exposure, take into account the source of the bodily contamination. For example, blood from a fellow Soldier would fall into a low risk category for exposure.

MANAGEMENT:

1. Wash area with soap and water to clean area and minimize exposure.
2. Use a Rapid HIV Test Kit to determine if therapy should be initiated. **In high risk situations, do not delay initiation of therapy if the test kit is not available. HIV PEP should be started within 1–2 hours of exposure.**
3. Consult with unit medical officer ASAP to discuss the case and obtain further guidance after any significant exposure.
   A. If the Rapid HIV Test is positive, initiate PEP.
   B. If high-risk exposure occurs and a Rapid HIV Test is unavailable, initiate PEP.
   C. If a Rapid HIV Test is negative, seek medical officer guidance to determine the need for PEP.
4. 
Initiate antiretroviral triple therapy according to the following priority of drugs. **Choose only 1 of the following drug treatment options.**
   A. Atripla (emtricitabine/tenofovir/efavirenz), 1 PO qd
      1) 

52% incidence of CNS side-effects
      2) 

Known to cause birth defects. Category D drug. Be sure that a female patient has a negative pregnancy test prior to administration of Atripla.
   B. **OR** Combivir® (lamivudine and zidovudine) 1 tablet PO bid **AND** Viread (tenofovir) 300mg PO qd
   C. **OR** Truvada (emtricitabine/tenofovir) 1 PO qd **AND** Kaletra (lopinavir/ritonavir) 4 pills PO qd, taken simultaneously

D. **OR** Truvada (emtricitibine/tenofovir) 1 PO qd **AND** AZT (Zidovudine) 300mg PO bid

1) Possible antagonism with decreased effectiveness.

E. **OR** Combivir® (Lamivudine and Zidovudine) 1 tablet PO bid **AND** Viracept® [Nelfinavir] 1250mg PO bid

1) Older regimen. Replaced by options 4a and 4b.

5. Do not use alcoholic beverages after Combivir administration.
6. For GI side-effects of medication, treat per *Nausea and Vomiting Protocol*
7. Maintain hydration and nutrition status.

DISPOSITION:

1. *Urgent* evacuation if a significant exposure occurs and HAART is not available.
2. *Routine* evacuation if HAART is available and Rapid HIV Test is positive.
3. Consult unit medical officer to determine the need for, and the priority of evacuation, if high-risk exposure has occurred and a Rapid HIV Test is negative.

INGROWN TOENAIL

SPECIAL CONSIDERATIONS:

1. Consider toenail removal only if close follow-up is possible.
2. 

DO NOT USE local anesthetic with epinephrine.

SIGNS AND SYMPTOMS:

1. Pressure over the nail margins increases the pain.
2. Inflammatory or infectious responses are generally localized.
3. Partial or complete nail removal is typically indicated in chronic inflammation / infection, with severe pain of both medial and lateral nail folds, especially if the condition has lasted one month or greater.

MANAGEMENT:

1. Partial/complete toenail removal:
   A. Clean the site with soap, water, and betadine.
   B.  Perform a digital block at the base of the toe using lidocaine 1% **WITHOUT EPINEPHRINE.**
   C. Apply constricting band to base of toe.
   D. Remove the lateral quarter of the nail toward the cuticle (or whole nail), using a sharp scissors with upward pressure.
   E. Bluntly dissect the nail from the underlying matrix with a flat object, elevate the nail and grasp it with a hemostat or forceps, removing the piece.
   F. Clean the nail grooves to remove any debris.
   G. Remove constricting band.
   H. Control bleeding with direct pressure and dry the underlying nail bed.
2.  Mupirocin (Bactroban) 2% ointment to exposed nail bed.
3. Dress with a non-adherent dressing and dry bandage.
4. Instruct the patient to wash the area daily.
5. Recheck wound and change dressing daily.
6. Instruct patient to wear less constricting shoes and to trim their nails straight across. Optimal care is to limit walking and marching for 3–5 days.
7. Treat per *Pain Management Protocol*.
8.  Systemic antibiotics are typically not needed in these procedures; however, consider using Moxifloxacin (Avelox) 400mg PO qd for 10 days, **OR** Amoxicillin/Clavulanic Acid (Augmentin) 875mg PO bid for 10 days if an infection is suspected (increasing pain, redness, and swelling).

DISPOSITION:

1. Evacuation is usually not required if the condition responds to therapy.
2. The nail bed may have serous drainage for several weeks, but will usually heal within 2–4 weeks.

JOINT INFECTION

SPECIAL CONSIDERATIONS:
1. May result from penetrating trauma (especially animal or human bites), gonorrhea, or iatrogenic causes (i.e., attempted aspiration of joint effusion).
2. Consider also an acute joint effusion due to blunt trauma or overuse (usually less red and no fever).

SIGNS AND SYMPTOMS:
1. History of adjacent penetrating trauma or infection
2. Single red, swollen joint
3. Fever
4. Pain

MANAGEMENT:
1. IV access
2.  Ceftriaxone (Rocephin) 2gm IV / IM bid **OR** Ertapenem (Invanz) 1gm IV / IM qd .
3. Treat per *Pain Management Protocol.*
   A. If evacuation is prolonged and pain is unresponsive to analgesia, consider draining joint (if properly trained)
4. **IMMOBILIZE THE JOINT.**

DISPOSITION:
Priority evacuation

K-9 EVALUATION AND TREATMENT

VITAL SIGNS OF CANINES:

1. Temperature:
   A. Normal Rectal Temp is 100-102.5° F.
   B. Temperature after exercise: 103-106° F.
2. Pulse
   A. Normal pulse rate will vary from 60-80bpm. Can beat up to 130 with exercise.
   B. The pulse rate and respiration rate will vary from dog to dog, and will also vary if the dog is at rest or working.
   C. The femoral artery is located on the inside of a dog's rear thighs. Take your hand as if you were passing someone a plate, grab the dog on the rear of their thigh with your fingers inside the thigh, and palpate the artery.
3. Normal respiration rate for an adult dog will vary between 10-40 respirations per minute
4. Capillary refill time: less than 2 seconds.
5. Mucous membrane color: generally pink.

SPECIFIC WEIGHT RELATED DRUG DOSES ARE AT THE END OF THIS PROTOCOL MOST DOG HANDLERS WILL CARRY A DRUG CARD FOR THE DOG.

MONITORING:

1. Pulse Ox – Placed on tongue, ear, or other non pigmented, highly vascular area (lip)
2. EKG – Alligator clips behind each elbow and above left knee. If you do not have alligator clips place the buttons or leads behind the largest pad on the foot using.
3. Animals do not have palpable carotid pulses. You can obtain a femoral pulse in the inguinal crease.

IM INJECTION SITES:

1. Gluteal muscles

IV SITES:

Usually the easiest/best vein to use for a K-9 IV is the one found on their forelegs. The cephalic vein is located on the middle of the foreleg. This is the most commonly used vein for fluid administration and IV delivery of drugs.

If the person occluding the vein for you rolls it laterally, this will place the vein directly on top of the dog's leg, easing access.

Maintain a firm hold on the dogs leg as you place the catheter, as they will pull away from you while placing the catheter.

Start distally on the vein. If you blow the vein, move more proximally and attempt the IV.

In the hind leg, the lateral saphenous vein is used. This vein is harder to maintain and secure.

In both procedures use plenty of tape to secure the IV line. Your patient will try to pull it out. If they are ambulatory, movement will often dislodge the IV. IVs in conscious dogs must be monitored.

PRE-HYDRATION FLUID THERAPY:

1. Handlers may pre-load prior to event (approximately 2 hours prior to even to allow for absorption)
2. Normal Saline or Lactated Ringer's Solution, 500ml SQ
3. Administer SQ between the shoulder blades

HYDRATION STATUS:

1. Normal Hydration: Pick up skin and release. It should return to the position that it was, within 1 second.
   A. Capillary Refill Time (CRT) is measured by pressing on the gums over the canine tooth. Using one finger, press down firmly until the gums turn white under your finger and release. Also, note the normal color of your dog's gums and mouth. Dog's gum color may vary from black, pink, reddish brown or any combination of colors.
2. Dehydration:
   A. 6-8% dehydration – loss of skin elasticity, tacky gums, mildly prolonged CRT
   B. 10-12% dehydration – tented skin, dry gums, prolonged CRT, sunken eyes, increased HR, rapid/weak pulses
3. Dehydration Fluid Replacement
   A. Estimate dehydration
      1) 5% give 800ml bolus IV
      2) 10% give 1500ml bolus IV
   B. Fluid choice is normal saline or Lactated Ringer's Solution
   C. The best technique to rehydrate the dog is through oral consumption.

RESTRAINT (SOF medical personnel should work with handler to learn muzzling techniques):

1. Always muzzle dog when working on them.
2. Physical restraints with muzzles or improvised muzzles
   A. Field expedient muzzle:
      1) Kerlix is wrapped around the snout several times and then tied behind the head.

2) The leash is wrapped around the snout

3. Chemical restraint if needed to protect handler and medic
   A. Dexdomitor (if not traumatic injury) reversed with Antisedan. Dexdomitor after onset gives 20-30 minutes of good sedation when administered with labeled dose.
   B. Morphine can be used for sedation and restraint at 30-50mg IM.

K-9 HEAT INJURIES

SPECIAL CONSIDERATIONS:
1. Heat injuries are life threatening for an animal.
2. Dehydration accompanies heat injuries.
3. Crystalloids are preferred over colloids. However, use of colloids is better than nothing.

HEAT EXHAUSTION

SIGNS AND SYMPTOMS:
1. Recent activity and history,
2. Rectal temp maybe over 105
3. Fast and shallow panting that does not slow in a couple of minutes
4. Heart rate may be over 140 bpm
5. Brick red mucous membranes
6. Pulse may be bounding or thready and weak
7. Dog looking for a cool place to lay down or just stops working

HEAT STROKE

SIGNS AND SYMPTOMS:
1. Recent activity and history
2. Temp over 106° F
3. Pale gums
4. Rapid and shallow breathing
5. Collapse
6. Weak
7. Uncoordinated
8. Seizures
9. Vomiting
10. Diarrhea

MANAGEMENT:
1. Shade or AC
2. Wet down or submerge in cool water. If possible fan dog afterwards.

Do not put a wet dog in the kennel. This will create a sauna like effect upon the dog.

3. Alcohol on pads
4. Cool ice packs under groin and arm pits.
5. IV fluid therapy.
6. Continuous monitoring until temp drops to below 103° F.

K-9 HIGH ALTITUDE SICKNESS AND PULMONARY EDEMA

SPECIAL CONSIDERATIONS:
Typically not seen in dogs, but may occur

SIGNS AND SYMPTOMS:
1. Reduced appetite
2. Listlessness
3. Reduced activity levels
4. "Mildly dusky" tongue color/pale gums
5. Brown or pink tinted fluids from mouth or nose
6. Lung sounds (fluid in lungs)

PROPHYLAXIS:

1. Acetazolamide (Diamox),
   A. 250mg PO bid 24 hours prior to ascent and continued for 48 hours after maximum altitude is reached.
   B. If the 500mg sustained release tablet is used, dose is 500mg PO every 24 hours.

TREATMENT:
1. Descend from altitude and treat symptoms
2. Oxygen
   a. Example of blow by oxygen administration

   b. Put O2 line in a cage/Vari kennel and cover with a poncho line, rain coat, etc...

3. Dexamethasone, 4mg IV / IM/ PO q 6hr
4. Albuterol inhaler can be attempted
   A. Apply field expedient muzzle as shown.
   B. Improvise a nebulizer by using a plastic bag or paper bag. Open the bag; squirt the albuterol into the bag. Place the bag over the muzzle and let the dog breath a few breaths from the bag.

K-9 TRAUMA MANAGEMENT

SPECIAL CONSIDERATIONS:
1. Control bleeding first based on K9-TCCC standards and guidance for humans.
2. Follow **MARCH** protocol

SIGNS AND SYMPTOMS for Shock:
1. Pale color in gums, capillary refill time greater than 2 seconds
2. Dry lips and gums, dehydration
3. Excessive drooling in some poison cases
4. Weak femoral pulse
5. Rapid heart rate of 150-200 beats per minute
6. Cool extremities
7. Hyperventilation, rapid breathing generally over 25 breaths per minute
8. Confusion, restless, anxiousness
9. General weakness

Advanced stages of shock:
1. Continued depression and weakness to the point of not being able to move or becoming unresponsive or unconscious
2. Dilated pupils
3. Capillary refill time greater than 4 seconds
4. White mucous membranes
5. Body temperature below 98° F, taken rectally.

MANAGEMENT:
1. *MARCH* Protocol

2. **M**assive hemorrhage: Control bleeding per TCCC standards

3. **A**irway
   A. An injured dog or an animal in shock may not recognize you. The dog may bite you out of pain or fear. If the dog is having trouble breathing or panting heavily, **DO NOT** apply a muzzle. If a muzzle is placed on the dog it must be monitored at all times and removed at the first sign of overheating or vomiting. Get help, if possible from someone who can help hold the dog, so you can do an examination and/or treat the dog.
      1) Carefully pull the tongue out of the animal's mouth.
      2) 

Even an unresponsive dog may bite by instinct!!
      3) Make sure that the neck is reasonably straight; try to bring the head in-line with the neck.
      4) 

Do not hyperextend in cases where neck trauma exists
   B. Visibly inspect the airway by looking into the mouth, and down the throat for foreign objects occluding the airway. Unlike human CPR, rescuers may reach into the airway and remove foreign objects that are visible
   C. Attempt 2 rescue breaths, by closing the mouth, and performing mouth-to-nose ventilations.

D. If spontaneous breathing fails to occur, reposition the neck and try step C again.
E. Intubation if necessary to assure airway

1) WARNING Do not attempt to intubate a conscious animal, personnel must have prior training. ET tube size can range from 7-10.

F. If intubation is not possible, then attempt cricothrotomy.
G. After achieving a patent airway, one must determine whether the animal is breathing, and whether this breathing is effective.
H. **AIRWAY CONSIDERATIONS:**
   1) Size 9 or 10mm cuffed endotracheal tube, secure with gauze or IV tubing. Tie over nose.
   2) Passive flow airway – secure air line to muzzle.
   3) Field expedient masks.
   4) Dogs do not tolerate nasal trumpets.

4. **R**espirations
   A. Look, Listen, and Feel
   B. If not breathing, ventilate the animal by closing the mouth, and performing mouth-to-nose ventilations.
   C. Ventilate at 20 breaths per minute.
   D. If available, use supplemental oxygen
   E. Needle thoracentesis: Place the dog in the lateral recumbent position, go mid way between sternum and spine between the 7th and 9th ribs.

5. **C**irculation
   A. Be sure that there are no major (pooling/spurting blood) points of bleeding. Control as necessary.
   B. Hemorrhagic Shock Fluid Resuscitation (Administration Routes):
      1) Preferred is IV
      2) Secondary route is SQ
      3) Tertiary route is IO (ileum or tibia)
   C. Oxyglobin
      1) One 125ml bag in first half hour
      2) Repeat x 1 if necessary
   D. Incorporate crystalloids and colloids as needed
      1) Bolus of crystalloid, 700ml IV, reassess and repeat a maximum of 2 times
      2) Bolus of colloid, 700ml IV, reassess and repeat a maximum of 2 times
   E. Blood transfusion (dog-to-dog), if available.
   F. Monitor for circulatory overload

6. **H**ypothermia: Prevent loss of body heat

7. Antibiotic Therapy for Penetrating Wounds
   A. Ceftriaxone (Rocephin) 1gm IV / IM daily
   B. **OR** Ertapenem (Invanz) 250mg IV / IM three times a day

K-9 RDX (C-4) INGESTION

SIGNS AND SYMPTOMS:

1. Tonic – clonic convulsions
2. Coma
3. Lethargy
4. Confusion
5. Muscle spasms
6. Nausea / vomiting
7. Abdominal tenderness
8. Cardiac arrhythmias

TREATMENT:

1. If recognized immediately after ingestion, induce vomiting (prior to the occurrence of clinical signs) with hydrogen peroxide, 30cc PO. Repeat dose in 15 minutes.
2. Control seizures with diazepam (Valium), 5mg IV bolus for a 30kg dog. Repeat as necessary to a maximum of 4 doses.
3. Ipecac is contraindicated in the treatment of K-9 toxic ingestion.
4. If you have time during evacuation, initiate IV fluids.

DISPOSITION:
Evacuation to veterinarian immediately for follow up or supportive care.

LOSS OF CONSCIOUSNESS (WITHOUT SEIZURES)

SPECIAL CONSIDERATIONS:

1. The most common cause of loss of consciousness in healthy adults is orthostatic hypotension (associated with sudden standing) or vasovagal syncope (associated with sudden adverse stimulus – injections are a common cause).
2. Also consider hypoglycemia, anaphylactic reaction, medication, recreational drug use, head trauma, hyperthermia, hypothermia, myocardial infarction, lightning strikes, and intracranial bleeding.

SIGNS AND SYMPTOMS:

Unconsciousness

MANAGEMENT:

1. Follow BLS guidelines.
2. Management of orthostatic hypotension and vasovagal syncope is accomplished by placing the patient in a supine position, ensuring the airway is open. Patients experiencing these two disorders should regain consciousness within a few seconds. If they don't, consider other etiologies and proceed to the steps below.
3. Pulse oximetry monitoring.
4. Oxygen.
5.  Place either 1 tube Glutose (oral glucose gel) in buccal mucosal region.
6. Consider IV access.
7.  Naloxone (Narcan) 0.8mg IV / IM. Repeat q 2–3 min prn to max dose of 10mg ***if opiate use is suspected***.
8. If no response treat per appropriate Protocol per Special Considerations #2.

DISPOSITION:

1. *Urgent* evacuation, unless loss of consciousness due to orthostatic hypotension or vasovagal hypotension.
2. The evacuation package should include personnel certified in Advanced Cardiac Life Support (ACLS), with equipment, supplies and medications necessary for ACLS care.

MALARIA

SPECIAL CONSIDERATIONS:

1. Malaria MUST be considered in all febrile patients currently in, or recently in, a malarious area.
2. It is not uncommon for malaria to present like pneumonia or gastroenteritis (with vomiting and diarrhea).
3. The use of chemoprophylaxis does not rule out malaria.
4. Consider bacterial meningitis in evaluating the – treat for both disorders if meningitis is suspected.

SIGNS AND SYMPTOMS:

1. Prodrome of malaise, fatigue, and myalgia may precede febrile paroxysm by several days.
2. Paroxysm characterized by abrupt onset of fever, chills, rigors, profuse sweats, headache, backache, myalgia, abdominal pain, nausea, vomiting, and diarrhea (may be watery and profuse) in *P. falciparum*.
3. Intermittent fever to >40° C (105° F) OR fever may be near continuous in *P. falciparum* malaria; classic "periodicity" is usually absent. Profuse sweating between febrile paroxysms.
4. Tachycardia, orthostatic hypotension, tender hepatomegaly, and delirium (Cerebral malaria).

MANAGEMENT:

1. Malarone (atovaquone 250mg/proguanil 100mg) 4 tabs qd for 3 days with food **PLUS** primaquine 30mg qd for 14 days **(MUST** rule out G6PD deficiency before giving primaquine).

2. Acetaminophen (Tylenol) 1000mg PO q 6hr prn for fever.

DISPOSITION:

1. *Urgent* treatment and evacuation for complicated malaria (cerebral, pulmonary, unstable vital signs). These indicate a medical emergency.
2. *Routine* evacuation for uncomplicated cases (normal vital signs, normal mental status, tolerates PO, no cough/ shortness of breath).

MENINGITIS

SPECIAL CONSIDERATIONS:
1. May be bacterial, viral, or fungal. The bacterial type may cause death in hours, even in previously healthy young adults, if not treated aggressively with appropriate antibiotics.
2. Consider malaria as a differential diagnosis. Treat for both if malaria cannot be ruled out.

SIGNS AND SYMPTOMS:
1. Classic features include:
   A. Severe headache
   B. High fever
   C. Pain with any neck movement, particularly forward flexion
   D. Altered mental status
2. May also include:
   A. Photophobia
   B. Nausea and vomiting
   C. Malaise
   D. Seizures
3. Positive Brudzinski's (pain with head and neck flexion) and Kernig's (neck pain with hip flexion and knee extension) signs

MANAGEMENT:
1. If meningitis is suspected, treatment should be initiated immediately.
2. IV access.
3.  Dexamethasone (Decadron) 10mg IV / IM q 6hr.
4.  Ceftriaxone (Rocephin) 2gm IV q 12hr (IM route possible alternative but prefer IV route).
5. Treat per *Pain Management Protocol*.
6. Treat per *Nausea and Vomiting Protocol*.
7. If seizures occur, treat per *Seizure Protocol*.
8.  Moxifloxacin (Avelox) 400mg PO once **OR** Ceftriaxone (Rocephin) 250mg IM for prophylaxis of close contacts.

DISPOSITION:
1. Urgent evacuation.

NAUSEA AND VOMITING

SPECIAL CONSIDERATIONS:
1. Avoid rapid IV administration of promethazine (Phenergan)
2. **DO NOT** give subcutaneous promethazine (Phenergan)
3. Diphenhydramine (Benadryl) and promethazine (Phenergan) may cause drowsiness.

SIGNS AND SYMPTOMS:
Nausea and Vomiting

MANAGEMENT:

1.  Ondansetron (Zofran) 4–8mg IV / IM bid or 8mg PO q 8hr prn.
2.  **OR** Promethazine (Phenergan) 25mg IV / IM / PO q 6hr prn.
3.  **OR** Diphenhydramine (Benadryl) 25–50mg IV / IM / PO q 6hr prn (may be useful for vertigo or motion sickness).
4. Treat per *Dehydration Protocol*.

DISPOSITION:
Evacuate per Protocol for underlying condition.

PAIN MANAGEMENT

SPECIAL CONSIDERATIONS:
1. Any use of narcotic medications will be sedating and degrade the mission performance of patients
2. Avoid IM or SQ injections of narcotic medications due to the potential for delayed absorption.

SIGNS AND SYMPTOMS:
Pain

MANAGEMENT:
1. Start in sequential manner to maximize pain control with mission performance.

A. Acetaminophen (Tylenol) 1000mg PO q 6hr prn.

B. Non-steroidal anti-inflammatory drugs

1) Meloxicam (Mobic) 15mg PO qd prn

2) **OR** Ibuprofen (Motrin) 800mg PO q 8hr prn

3) **OR** Ketorolac (Toradol) 30mg IM q 6hr prn.
   a. Consider 10mg PO q 8hr prn for prolonged use .

C. Narcotic Medications

1) Oral Transmucosal Fentanyl Citrate (Actiq Lozenge) 800mcg orally over 15 minutes (may repeat dose once)

Life-threatening hypoventilation/ respiratory arrest could occur at any dose of fentanyl, particularly in patients not taking chronic narcotics. Therefore, closely monitor for respiratory depression.

2) Morphine sulfate 5mg IV initial dose then 5mg IV q 10 min for max dose of 30mg

2. Treat per *Nausea and Vomiting Protocol.*

DISPOSITION:
1. Consider underlying cause to determine evacuation priority.
2. Patients receiving IV/IM opiates should most likely be evacuated.

PNEUMOTHORAX - ACUTE (ATRAUMATIC)

SPECIAL CONSIDERATIONS:
1. Consider also: anaphylaxis, pulmonary embolism, high altitude pulmonary edema (HAPE), asthma, myocardial infarction and pneumonia.
2. More common in tall, thin individuals and smokers.

SIGNS AND SYMPTOMS:
1. Acute, unilateral chest pain
2. Dyspnea – typically mild
3. No wheezing
4. Decreased or absent breath sounds on affected side

MANAGEMENT:
1. Pulse oximetry monitoring
2. Oxygen (use oxygen for all suspected acute pneumothoraces)
3. Consider needle decompression for suspected tension pneumothorax.
4. If needle decompression shows immediate patient improvement, followed by worsening of condition, consider repeat needle decompression.
5. Consider tube thoracostomy:
   A. Recurrence of respiratory distress after 2 successful needle decompressions
   B. Evacuation time > 1hr with continued respiratory distress.
   C. Patient requires positive pressure ventilation
6. If at altitude, descend as far as tactically feasible.
7. If evacuation will occur in an unpressurized aircraft, consider decompression for high altitude evacuation and recommend lowest tactically feasible altitude
8. Treat per *Pain Management Protocol.*

DISPOSITION:
1. *Urgent* evacuation for significant respiratory distress despite therapy.
2. *Priority* evacuation for patients whose respiratory status is stable.

RHABDOMYOLYSIS PROTOCOL

SPECIAL CONSIDERATIONS:
1. Aggressive hydration is the cornerstone of treatment.
2. Causes: Limb ischemia, Carbon Monoxide Poisoning, Electrical or thermal burns, Blunt trauma or Crush injury, Snake Bite, Hyperthermia, Hypothermia, Physical Exertion

SIGNS AND SYMPTOMS:
1. Acute muscle pain (myalgias)
2. Muscle Weakness
3. Fever
4. Malaise
5. Nausea or Vomiting
6. Tea-colored urine
7. Oliguria/Anuria
8. Dipstick positive for blood, but no intact RBC on a spun specimen

MANAGEMENT:
1. Normal saline 1-2L bolus IV/IO followed by 500ml – 1L/hr.
   A. Avoid Ringer's lactate due to the potassium content
   B. **Titrate to achieve target urine output of >200ml/hr**
   C. Monitor intake/output hourly. If possible, insert Foley catheter to facilitate measuring urine output
   D. Consider urinary alkalinization to achieve urine pH > 6.5
      1) Mix Sodium Bicarbonate 40mEq (1 ampule/bristojet) in 500ml normal saline. Run at 100ml/hr.
2. Reassess vital signs and mental status frequently
3. Utilize Propaq or AED cardiac monitoring if available
4. Potential Problems / Complications
   A. Monitor for signs and symptoms of hyperkalemia (cardiac dysrhythmia) – administer 1gm calcium and 40mEq sodium bicarbonate (1 ampule) IV/IO
   B. Persistent oliguria despite adequate fluid resuscitation
   C. Hypocalcemia (provoked by sodium bicarbonate) – peri-oral tingling, muscle tetany, increased deep tendon reflexes, QT prolongation on cardiac monitor – stop sodium bicarbonate infusion
   D. Avoid loop diuretics such as furosemide (Lasix), which may increase myoglobin precipitation in kidneys and provoke acute renal failure
   E. Compartment syndrome – see *Tactical Trauma Protocols*

References:

1. Marx in Rosen (2002) Emergency Medicine 1762-70.
2. Sauret (2002) Am Fam Physician 65 (5): 907-12.
3. http://www.fpnotebook.com/renal/Failure/Rhbdmylys.htm.
4. http://emedicine.medscape.com/article/827738-treatment.

DISPOSITION:
Urgent evacuation

SEIZURE

SPECIAL CONSIDERATIONS:
1. May be caused by injury, infection, high fever, alcohol withdrawal, drug use, toxins, and structural abnormalities of the central nervous system (CNS).
2. Possible history of previous seizures, recent head trauma, CNS infection, or headaches

SIGNS AND SYMPTOMS:
1. Involuntary repetitive muscle movements that are abrupt in onset
2. Associated unresponsiveness
3. Typically lasts 90-120 seconds.
4. Followed by period of confusion and somnolence (postictal state)
5. Evidence of recent seizure activity may include urinary incontinence and acute intraoral trauma (e.g.: tongue biting)

MANAGEMENT:
1. Avoid trauma to patient during the seizure, but do not restrain patient.
2.  Diazepam (Valium) 5-10mg IV/IO q 5 min or 10mg IM q 15 min to a maximum dose of 20mg.
   A.  **OR** Midazolam (Versed) 5mg IV/IO q 5 min or 5-10mg IM q 15 min (no maximum dose)
3.  Fosphenytoin (Cerebyx) 18mg/kg IV/IO over 15 minutes or IM (if available) for seizures refractory to benzodiazepines.
   A.  **Do not administer fosphenytoin faster than 150 mg/min since this may result in hypotension.**
4. Do not attempt to force an object into the mouth to open airway.
5. Support and maintain airway and ventilation as needed to include SPO_2.
6. If seizures are accompanied by fever,
   A. Consider meningitis and treat per *Meningitis Protocol*.
   B. Consider malaria if in malaria endemic area and treat per *Malaria Protocol*

DISPOSITION: *Urgent* evacuation

SEPSIS/ SEPTIC SHOCK

SPECIAL CONSIDERATIONS:
1. Sepsis is a severe, life-threatening bacterial blood infection.
2. Rapid onset - death may occur within 4-6 hours without antibiotic therapy.

SIGNS AND SYMPTOMS:
1. Hypotension
2. Fever
3. Tachycardia
4. Altered mental status
5. Dyspnea
6. May see skin rash (purport)

MANAGEMENT:
1. Obtain IV/ IO access.
2.  Ertapenem (Invanz) 1gm IV / IO qd **OR** Ceftriaxone (Rocephin) 2gm IV / IO.
3. If patient is hypotensive, give 1L normal saline or Ringer's lactate fluid bolus. Consider additional fluids if still hypotensive, then an additional liter titrated to maintain systolic blood pressure >90mmHg or palpable radial pulse.
   A. Hextend 500mL IV boluses may be used (if crystalloids are unavailable) to maintain palpable radial pulse of systolic BP of 90mmHg.
4.  Epinephrine 0.5mg (0.5ml of 1:1,000 solution) IM **(DO NOT GIVE IV)** for persistent hypotension after fluid bolus.
5.  Dexamethasone (Decadron) 10mg IV if persistent hypotension after fluid bolus and Epinephrine.
6. Monitor for decreased mental status and be prepared to manage airway.

DISPOSITION:
Urgent evacuation

SMOKE INHALATION

SPECIAL CONSIDERATIONS:
1. Consider possible carbon monoxide (CO) poisoning and need for hyperbaric oxygen in all significant cases of smoke inhalation.
2. Normal oxygen saturation by pulse oximetry DOES NOT rule out the possibility of CO poisoning.
3. Burns to the upper airway may not be immediately obvious. Strong consideration should be given to early airway intervention if upper airway burns are suspected.

SIGNS AND SYMPTOMS:
1. History of smoke exposure
2. Burns
3. Coughing
4. Respiratory distress (may be delayed in onset)

MANAGEMENT:
1. Administer oxygen.
2. Consider the use of early intubation or cricothyroidotomy if airway burns/ edema or singed nasal hair, facial burns are present/ suspected.
3.  Albuterol (Ventolin) by metered dose inhaler 2–4 puffs q4–6hr.
4.  Dexamethasone (Decadron) 10mg IV / IM qd.
5. Limit patient exertion if possible.

DISPOSITION:
1. *Urgent* evacuation for respiratory distress, suspected inhalation burns.
2. *Priority* evacuation if not in distress but significant inhalation suspected.

SUBUNGUAL HEMATOMA

SPECIAL CONSIDERATIONS:
None

SIGNS AND SYMPTOMS:
1. Pain from the affected nail
2. Purplish-black discoloration under the nail

MANAGEMENT:
1. Decompress the nail with a large gauge needle by rotating needle through the nail directly over the discolored area until the underlying blood has been released and the pressure is relieved. Make sure that it is introduced into the affected nail with a gentle but sustained rotating motion.

2. Gentle pressure on the affected nail may help to evacuate more blood.

3. Treat per *Pain Management Protocol*.

4. If a fracture is suspected, tape the injured finger or toe to an adjacent digit.

5.  If fracture is suspected in a setting of a subungual hematoma, give Moxifloxacin (Avelox) 400mg PO qd for 7 days.

DISPOSITION:
Evacuation should not be required for this injury if the subungal hematoma is successfully treated.

TESTICULAR PAIN

SPECIAL CONSIDERATIONS:

1. The primary concern in testicular pain is differentiating testicular torsion from other causes of testicular pain
2. Testicular torsion is an medical emergency requiring urgent correction to prevent loss of the affected testicle
3. Other common causes of testicular pain include epididymitis and orchitis, infections commonly caused by STDs, as well as hernias and testicular masses

SIGNS AND SYMPTOMS:

1. Testicular Torsion:
   A. Sudden onset testicular pain
   B. Usually associated with activity
   C. Associated testicular swelling
   D. Abnormal position of the affected testicle
   E. Symptoms may be increased by testicular elevation
   F. Usually associated with pain induced nausea and vomiting
   G. Loss of cremasteric reflex is the best diagnostic indicator for testicular torsion.

2. Epididymitis:
   A. Gradual onset of worsening pain
   B. May have fever and/or dysuria
   C. Can also be traumatic
   D. Symptoms may be relieved with elevation
   E. Significant swelling may be present

MANAGEMENT:

1. If pain is sudden onset and the testicle is lying abnormally in the scrotum, an attempt to manual detorse the testicle is warranted.
   A. A single attempt to rotate the testicle outward (like opening the pages of a book) should be made.
   B. If pain increases, 1 attempt to rotate the opposite direction should be made.
   C. Successful detorsion will result in relief of pain.

2. Gradual onset of pain with a normal lying testicle should be treated per *Urinary Tract Infection Protocol*.

3. Treat per *Pain Management Protocol*.

4. Treat per *Nausea and Vomiting Protocol*

5. If torsion is not present, treat as presumed STD.
   A. Ceftraxone (Rocephin) 250mg IM **OR** ciprofloxacin (Cipro) 500mg PO
   B. **PLUS** doxycycline (Adoxa) 100mg PO bid for 10 days.

DISPOSITION:

1. *Urgent* evacuation for testicular torsion even if manually relieved with detorsion
2. For other causes of testicular pain, treat cause and consider evacuation if symptoms persist more than 3 days, and if the patient is operationally compromised.

URINARY TRACT INFECTION

SPECIAL CONSIDERATIONS:
1. More common after instrumentation, in females, or in tactical settings with dehydration and/ or kidney stones.
2. Symptoms may be confused with a sexually transmitted disease (STD).

SIGNS AND SYMPTOMS:
1. Dysuria
2. Urinary urgency and frequency
3. Cloudy, malodorous, or dark urine may be present
4. Suprapubic discomfort

MANAGEMENT:

1.  Ceftriaxone (Rocephin) 1gm IV / IM **OR** Trimethoprim-Sulfamethoxazole (Septra DS) 1 PO bid for 3 days
2. **AND**  Azithromycin 1gm PO once.
3. Treat per *Pain Management Protocol*, excluding narcotics.
4. If fever, back pain, flank pain, and/ or costovertebral angle tenderness develop, suspect kidney infection and treat per *Flank Pain Protocol*.
5. Encourage PO hydration.

DISPOSITION:
1. Usually responds to therapy and evacuation not required if it does.
2. *Priority* evacuation for pyelonephritis. See *Flank Pain Protocol*
3. *Routine* evacuation for worsening signs and symptoms
4. Upon return to base, all males should be evaluated for UTI, even if asymptomatic.

2010 Tactical Medical Emergency Protocol
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Joint Special Operations
Tactical Medical Emergency Protocol Recommended Drug List:

JANUARY 10, 2011

USSOCOM OFFICE OF THE COMMAND SURGEON
DEPARTMENT OF EMERGENCY MEDICAL SERVICES AND PUBLIC HEALTH
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PREFACE

- The following is a list of medications mentioned in the Tactical Medical Emergency Protocols. However, most of the TMEPs have a preferred medication recommendation and then an alternate one. All of these recommendations are listed here.
- The CEB and RB recognize that a "one size fits all" approach to a strict formulary is unrealistic due to medication availability, mission requirements, etc. The list of medications is designed to guide the ATP in medication selection.
- For specific order of the recommended medications and specific TMEP application of the medications, **CHECK the specific TME Protocol**.
- Antibiotics: Always check potential drug allergies. If allergic to one class of medications, use alternate class of medications (Cephalosporins/Penicillins, Tetracyclines, Quinolones, Macrolides).
- **Unless specifically noted, the drug dosages listed are for an adult.**
- Changes – 2009:
  - Calcium Chloride added
  - Calcium Gluconate added
  - Mannitol added
  - Sodium Bicarbonate added
  - Rifampin added
  - Antiretroviral medication added (Kaletra, Atriplea, Truvada, Viread)
  - All medications listed under their generic name except for the following HIV medications, which are **the only drugs listed under their trade name (Atripla®, Combivir®, Truvada®, Kaletra®).**
  - Midazolam (Versed®) added.
  - Pregnancy Categories added according to FDA classification listed below.

Pregnancy Category A	Adequate and well-controlled studies have failed to demonstrate a risk to the fetus in the first trimester of pregnancy (and there is no evidence of risk in later trimesters).
Pregnancy Category B	Animal reproduction studies have failed to demonstrate a risk to the fetus and there are no adequate and well-controlled studies in pregnant women OR Animal studies have shown an adverse effect, but adequate and well-controlled studies in pregnant women have failed to demonstrate a risk to the fetus in any trimester.
Pregnancy Category C	Animal reproduction studies have shown an adverse effect on the fetus and there are no adequate and well-controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.
Pregnancy Category D	There is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience or studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.
Pregnancy Category X	Studies in animals or humans have demonstrated fetal abnormalities and/or there is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience, and the risks involved in use of the drug in pregnant women clearly outweigh potential benefits.

- **WARNING** Medications with grounding requirements for personnel on flight status have been added. In some cases, the recommendation for grounding has been made based on the underlying medical condition and not specifically on the medication. Whenever possible consult a Flight Surgeon or an Aeromedical Physician Assistant prior

to prescribing medications to personnel on flight status. Consult your unit medical officer for any unit specific protocols.
  - **REMINDER**: After personnel on flight status have been grounded, they need clearance from a Flight Surgeon or an Aeromedical Physician Assistant to return to flying status.

➢ **Changes – 2010:**
  - Tadalafil (Cialis) added
  - Sildenafil (Viagra) added
  - K-9 doses added to: acetamolazide, ceftriaxone, dexamethasone, ertapenem

Acetaminophen (Tylenol®)

- Description: Nonnarcotic analgesic and antipyretic. Blocks generation of pain impulses in the CNS by preventing sensitization of pain receptors.
- Indications: Mild pain or fever
- Dose:
  - 325–650mg PO q 4–6hr; or 1gm PO every 6–8hr
- **Contraindications:**
  - Individuals with hypersensitivity to drug
  - Cautious use in history of excess alcohol use
  - Chronic liver damage
- Pregnancy Category B
- Side-effects:
  - Rash
  - Urticaria,
- Adverse reactions:
  - Hemolytic anemia
  - Liver damage
- TMEP use
  - *Bronchitis/Pneumonia Protocol*
  - *Malaria Protocol*
  - *Pain Management Protocol*

Acetazolamide (Diamox®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Non-diuretic antihypertensive (carbonic anhydrase inhibitor)
- Indications:
  - Prevention and/or amelioration of symptoms associated with acute mountain sickness in climbers attempting rapid ascent and/or in those who are very susceptible to acute mountain sickness despite gradual ascent. For maximum benefit begin regimen 7 days prior to ascent. Of minimal benefit in Rx of AMS, HACE, or HAPE.
  - Treatment of acute high altitude illness
- Dose (Human):
  - 125–250mg bid, 24 hours prior to ascent, continuing for 48 hours after ascent. Prevention and/or amelioration benefits are nominal once ascent has commenced.
  - If the 500mg sustained release tablet is used, dose is 500mg every 24 hours.

- K-9 Dose:
  - 250mg bid 24 hours prior to ascent, continuing for 48 hours after ascent.
  - If the 500mg sustained release tablet is used, dose is 500mg every 24 hours.

- **Contraindications:**
  - Sulfa allergy.
- Pregnancy category C
- Side-effects:
  - Paresthesia in extremities
  - Hearing dysfunction/tinnitus
  - Loss of appetite
  - Taste alterations
  - Nausea
  - Vomiting
  - Diarrhea
  - Polyuria
  - Drowsiness
  - Confusion
- 

Warning
  - NOTE: Use of Diamox results in a significant alteration in taste. Carbonated beverages will have seriously altered taste, and may be undrinkable.
  - Increased fluid intake is required with use of Diamox: Although Diamox is not in the general drug class of "diuretics"; it has diuretic effects and can result in serious dehydration unless great care is taken to maintain proper hydration.
- Adverse reactions:
  - Transient myopia (usually resolves w/ DC of drug)
  - Urticaria
  - Melena
  - Hematuria
  - Flaccid paralysis
  - Photosensitivity
  - Convulsions
- TMEP use
  - *Altitude Illness Protocol*
  - K-9 *High Altitude Sickness* and *Pulmonary Edema Protocol*

Aciphex® – See Rabeprazole

Actiq Lozenge® – See Fentanyl, Oral

Adrenalin – See Epinephrine

Afrin Nasal Spray® – See Oxymetazline HCl

Albuterol Inhaler (Ventolin®, Proventil®)


- **WARNING** Aviation personnel are grounded until medical condition no longer interferes with safely preforning aviation duties and the patient is free of side-effects.
- Description: Inhaled beta-adrenergic agonist; relaxes bronchial smooth muscle
- Indications:
  - Relief of bronchospasm
  - Prevention/ treatment of exercise-induced bronchospasm
- Adult dose:
  - 2 inhalations q 4–6hr
  - Spray 4 times into the air if using for the first time or after >4 weeks of storage

- *Pediatric dose:*
  - *If >4yrs old, 1 inhalation q 4–6hr may be sufficient*
- **Contraindications:**
  - Known hypersensitivity to Albuterol
  - Pregnancy
- Pregnancy Category C
- Side-effects:
  - Similar in nature to reaction to other sympathomimetic agents
    - Tremor
    - Nausea
    - Nervousness
    - Palpitations
- Adverse reactions:
  - Hypertension
  - Angina
  - Vertigo
  - CNS stimulation
  - Sleeplessness
- TMEP use
  - *Asthma (Reactive Airway Disease) Protocol*
  - *Bronchitis/Pneumonia Protocol*
  - *Cough Protocol*
  - *Smoke Inhalation Protocol*

Amoxicillin/Clavulanate (Augmentin®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: Oral antibacterial combination consisting of the semisynthetic antibiotic amoxicillin and the β-lactamase inhibitor, clavulanate potassium (the potassium salt of clavulanic acid).
- Indications:
  - Lower respiratory tract infections
  - Otitis media
  - Sinusitis
  - Skin and skin structure infections
  - Urinary tract infections
- Adult dose: The usual adult dose is one 875mg tablet q 12hr.
- *Pediatric dose:*
  - *30mg/kg/day in divided doses (q 8–12hr) produces less nausea and diarrhea and is effective for most infections*
  - *Pediatric patients weighing 40kg or more should be dosed according to the adult recommendations.*
- **Contraindications:**
  - 

SERIOUS AND OCCASIONALLY FATAL HYPERSENSITIVITY (ANAPHYLACTIC) REACTIONS CAN OCCUR IN INDIVIDUALS WITH A HISTORY OF PENICILLIN HYPERSENSITIVITY
  - Do not use in patients with a history of liver failure
- Pregnancy Category B
- Side-effects: The majority of side-effects observed in clinical trials were of a mild and transient nature but can include:

- Diarrhea/loose stools
- Nausea
- Skin rashes and urticaria
- Vomiting
- Vaginitis

- Adverse reactions:
  - Hypersensitivity reactions
  - Hepatic dysfunction
  - Blood and lymphatic dysfunction (likely hypersensitivity-related)
- TMEP use
  - *Cellulitis/Cutaneous Abscess Protocol*
  - *Dental Pain Protocol*
  - *Flank Pain Protocol*
  - *Head and Neck Infection Protocol*
  - *Ingrown Toenail Protocol*

ASA – See Aspirin

Aspirin (ASA)

- Description: Analgesic, antipyretic, anti-inflammatory, anti-platelet effect
- Indications:
  - For the temporary relief of:
    - Mild to moderate pain
    - Fever.
  - MI Prophylaxis: Reduces the risk of death and/or nonfatal myocardial infarction in patients with a previous infarction or unstable angina pectoris.
  - MI/UA treatment
  - Transient Ischemic Attacks: Reducing the risk of recurrent transient ischemic attacks (TIAs) or stroke in patients who have transient ischemia of the brain due to fibrin emboli.
- Adult dose:
  - 325mg. One or two tablets/caplets with water. May be repeated every 4 hours as necessary up to 12 tablets/caplets a day or as directed by a doctor.
- *Pediatric dose:*
  - *>12 years and over: One or two tablets/caplets with water. May be repeated every 4 hours as necessary up to 12 tablets/caplets a day or as directed by a doctor*
  - *<12 years old: Do not give to children under 12 unless directed by a doctor*
- **Contraindications**:
  - Hypersensitivity to aspirin
  - Hypersensitivity to nonsteroidal anti-inflammatory agents (NSAID)
  - History of gastrointestinal bleeding
  - Patients with bleeding disorders (e.g., hemophilia)
  - Patient age < 16 years old
- Pregnancy Category D
- Side-effects:
  - Gastrointestinal symptoms
  - Gastrointestinal bleeding
  - Stomach pain
  - Heartburn
  - Nausea
  - Vomiting
- Adverse reactions:
  - Interacts with NSAIDs, Coumadin, Heparin

- TMEP use
  - *Chest Pain Protocol*
  - *Deep Venous Thrombosis Protocol*

Atovaquone 250mg/ Proguanil 100mg (Malarone®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Antimalarial
- Indications:
  - Prophylaxis and treatment of *Plasmodium falciparum malaria*
- Adult dose:
  - 

There are pediatric tablets as well as adult tablets
  - Prophylaxis
    - Start treatment 1 or 2 days prior to entering malaria endemic area and continue daily during the stay and for 7 days after return
    - 1 tablet (adult strength) daily
  - Treatment
    - 4 tablets (adult strength; total daily dose atovaquone 1gm / 400mg proguanil) as a single daily dose for 3 consecutive days
- *Pediatric dose:*
  - 

There are pediatric tablets as well as adult tablets
  - *Tablets may be crushed and mixed with condensed milk just prior to administration for those having difficulty in swallowing tablets*
  - *Prophylaxis dosing based on body weight*
    - *Safety and efficacy for prophylaxis have been established for children >11kg*
  - *Treatment dosing based on body weight*
    - *Safety and efficacy for treatment have been established for children > 5kg*

Dosage of atovaquone/proguanil in prevention of malaria in pediatric patients		
Weight (kg)	***Total daily dose***	***Dosage regimen***
11 to 20	*62.5mg / 25mg*	*1 pediatric tablet daily*
21 to 30	*125mg / 50mg*	*2 pediatric tablets as a single daily dose*
31 to 40	*187.5mg / 75mg*	*3 pediatric tablets as a single daily dose*
>40	*250mg / 100mg*	*1 tablet (adult strength) as a single daily dose*

Dosage of atovaquone/proguanil in treatment of malaria in pediatric patients		
Weight (kg)	***Total daily dose***	***Dosage regimen***
5 to 8	*125mg / 50mg*	*2 tablets (pediatric strength) daily for 3 consecutive days*
9 to 10	*187.5mg / 75mg*	*3 tablets (pediatric strength) daily for 3 consecutive days*
11 to 20	*250mg / 100mg*	*1 tablet (adult strength) daily for 3 consecutive days*
21 to 30	*500mg / 200mg*	*2 tablets (adult strength) as single daily dose for 3 consecutive days*
31 to 40	*750mg / 300mg*	*3 tablets (adult strength) as single daily dose for 3 consecutive days*
>40	*1gm / 400mg*	*4 tablets (adult strength) as single daily dose for 3 consecutive days*

- **Contraindications:**
  - Hypersensitivity to atovaquone, proguanil
  - Prophylaxis in patients with severe renal impairment (Cr CL < 30mL/min) unless potential benefits outweigh risks of non-treatment (progaunil accumulates in severe renal failure)
- Pregnancy Category C
- Side-effects:
  - Headache
  - Abdominal pain
  - Nausea/ vomiting/diarrhea
  - Dizziness
  - Cough (pediatrics)
- Adverse reactions:
  - Liver transaminase elevations
  - Possible association with seizures and psychotic events (e.g., hallucinations)
  - Cutaneous reactions, including photosensitivity, erythema multiforme and Stevens-Johnson Syndrome
- Other notes:
  - Take daily dose at the same time every day with food or milk
  - If vomiting occurs within 1 hour of dosing, repeat the dose
  - Treatment has not been evaluated for treatment of cerebral malaria or other severe manifestations of complicated malaria
  - Absorption may be reduced in patients with diarrhea or vomiting. May need to add antiemetic to prevent vomiting.
  - Include protective clothing, insect repellants, bed nets as important components of malaria prophylaxis
  - If a dose is skipped, take it as soon as possible, and then return to normal schedule. Do not double the next dose.
- TMEP use
  - *Malaria Protocol*

Atripla® (efavirenz/emtricitabine/tenofovir)

- **WARNING** GROUNDING medication for personnel on flight status.
- Indications: Treatment of HIV
- Dose:
  - Take 1 tablet qd PO on an empty stomach. Dosing at bedtime may improve the tolerability of nervous system symptoms
- **Contraindications:**
  - Do not take the following medicines with Atripla
    - Cisapride (Propulsid®)
    - Midazolam (Versed®)
    - Tiazolam (Halcion®)
    - Voriconazole (Vfend®)
- Pregnancy Category D
- Side-effects:
  - Cardiac disorders: Palpitations
  - Ear and labyrinth disorders: Tinnitus
  - Endocrine disorders: Gynecomastia
  - Eye disorders: Abnormal vision
  - Gastrointestinal disorders:
    - Constipation
    - Malabsorption
    - Abdominal pain
    - Increased amylase,
    - Pancreatitis

- Hepatobiliary disorders:
  - Hepatic enzyme increase,
  - Hepatic failure
  - Hepatitis
- Immune system disorders:
  - Allergic reaction
- Metabolism and nutrition disorders:
  - Hypercholesterolemia
  - Hypertriglyceridemia
  - Hypophosphatemia
  - Lactic acidosis
- Musculoskeletal and connective tissue disorders:
  - Arthralgia
  - Myalgia
  - Myopathy
- Nervous system disorders:
  - Abnormal coordination
  - Ataxia
  - Cerebellar coordination and balance disturbances
  - Convulsions
  - Hypoesthesia
  - Paresthesia
  - Neuropathy
  - Tremor
- Psychiatric disorders:
  - Aggressive reactions
  - Agitation
  - Delusions
  - Emotional lability
  - Mania
  - Neurosis
  - Paranoia
  - Psychosis
  - Suicide
- Respiratory, thoracic, and mediastinal disorders:
  - Dyspnea
- Renal and urinary disorders:
  - Renal insufficiency
  - Renal failure
- Skin and subcutaneous tissue disorders:
  - Flushing
  - Photoallergic dermatitis
  - Skin discoloration
  - Stevens-Johnson Syndrome
- Other notes:
  - Store at 25° C (77° F); excursions permitted to 15-30° C (59-86° F)
- TMEP use:
  - *HIV Post Exposure Prophylaxis Protocol*

Augmentin® – See Amoxicillin/Clavulanate

Avelox® – See Moxafloxacin

Azithromycin (Zithromax®, Z-Pak®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: Macrolide antibiotic
- Indications:
  - Acute bacterial sinusitis
  - Mild community-acquired pneumonia
  - Chancroid (Genital ulcer disease)
  - Pharyngitis/tonsillitis as alternative drug choice to first line therapy
  - Uncomplicated skin infections
  - Urethritis
- Adult dose:
  - For most bacterial infections: 500mg as single dose on day 1, then 250mg daily on days 2 through 5.
  - For gonorrhea: 2gm PO as a single dose
- *Pediatric dose: (6 months of age or older)*
  - *Z-pac is not indicated for children. The oral suspension is the only dose approved for use in children, and is dosed on a mg/kg basis*
    - *10mg/kg up to 500mg the first day; then 5mg/kg up to 250mg for the next 4 days*
- **Contraindications:**
  - Known allergy to Azithromycin
  - Pregnancy
  - Z-pac in children
  - Patients receiving
    - Astemizole (Hismanal – antihistamine taken off of the U.S. market)
    - Cisapride (Propulsid – GI medication)
- Pregnancy Category B
- Side-effects:
  - Generally mild and reversible upon discontinuation of therapy
  - Nausea, vomiting, diarrhea, abdominal pain
- Adverse reactions
  - Rare:
    - Angioedema (swelling of the larynx)
    - Cholestatic jaundice
  - Hypersensitivity
- Other notes
  - Can be taken with or without food
  - Continue regimen for duration of prescription
- TMEP use:
  - *Bronchitis/Pneumonia Protocol*
  - *Ear Infection Protocol*
  - *Gastroenteritis Protocol*
  - *Urinary Tract Infection Protocol*

AZT (Zidovudine, Retrovir®)

- **WARNING** GROUNDING medication for personnel on flight status
- Indications:
  - Treatment of HIV infection
- Dose:
  - 300mg bid
- Contraindications: Known allergy to medication
- Pregnancy Category C

- Side-effects:
  - Body as a whole:
  - Back pain
  - Chest pain
  - Flu-like syndrome
  - Generalized pain
- Cardiovascular:
  - Cardiomyopathy
  - Syncope
- Endocrine:
  - Gynecomastia.
- Eye:
  - Macular edema
- Gastrointestinal:
  - Dysphagia
  - Flatulence
  - Oral mucosa pigmentation
  - Mouth ulcer
  - Nausea
  - Vomiting
  - Diarrhea
- General:
  - Anaphylaxis
  - Angioedema
  - Vasculitis
- Heme and lymphatic:
  - Aplastic anemia
  - Hemolytic anemia
  - Leukopenia
  - Lymphadenopathy
  - Pancytopenia with marrow hypoplasia
  - Pure red cell aplasia
- Hepatobiliary tract and pancreas:
  - Hepatitis
  - Hepatomegaly with steatosis
  - Jaundice
  - Lactic acidosis
  - Pancreatitis
- Musculoskeletal:
  - Muscle spasm
  - Myopathy
  - Myositis
  - Rhabdomyolysis
  - Tremor
- Nervous:
  - Anxiety
  - Confusion
  - Depression
  - Dizziness
  - Loss of mental acuity
  - Mania
  - Paresthesia
  - Seizures
  - Somnolence
  - Vertigo
- Respiratory:
  - Dyspnea
  - Rhinitis

    - Sinusitis
    - Cough
    - Abnormal breathing and wheezing
- Skin:
    - Changes in skin and nail pigmentation
    - Pruritus
    - Stevens-Johnson Syndrome
    - Toxic epidermal necrolysis
- Special senses:
    - Amblyopia
    - Hearing loss
    - Photophobia
- Urogenital:
    - Urinary frequency
    - Urinary hesitancy
- TMEP use:
    - *HIV Post Exposure Prophylaxis Protocol*

Bactrim® – See Trimethoprim-Sulfamethoxazole

Bactroban® – See Mupirocin Ointment 2%

Benadryl® – See Diphenhydramine HCl

Bisacodyl (Dulcolax®)

- Description: Stimulant laxative
- Indications: Used to treat constipation or to clean out the intestinal tract before bowel examinations or bowel surgery.
- Adult dose: Swallow the tablets whole with a full glass of water or juice. Do not crush or chew the tablets. The tablets should work within 6–10hrs.
    - 5–15mg.
- *Pediatric dose:*
    - 6 to 12 years: 5mg, taken at bedtime or in the morning before breakfast to produce evacuation approximately 8 hours later.
- **Contraindications**:
    - Ileus
    - Intestinal obstruction
    - Acute surgical abdominal conditions like acute appendicitis, acute inflammatory bowel diseases.
    - Severe dehydration.
    - Known hypersensitivity to substances of the triarylmethane group.
- Adverse reactions: Rarely, abdominal discomfort and diarrhea have been reported.
- Other notes:
    - Tablets have a special coating and therefore should not be taken together with milk or antacids. Tablets should be swallowed whole with adequate fluid.
- TMEP use:
    - *Constipation/Fecal Impaction Protocol*

Calcium Chloride (10% solution)

- **WARNING** GROUNDING medication for personnel on flight status.
- Description: Calcium salt (electrolyte)
- Action
  - Increased calcium levels
  - Has a role in the release of neurotransmitters and hormones
  - Increased cardiac contractile state
  - May increase ventricular automaticity
- Indications:
  - Acute hypocalcemia
  - Acute hyperkalemia
  - Calcium channel blocker overdose
  - Hypermagnesemia
  - Cardiac arrest due to hyperkalemia, hypocalcemia
- Adult dose:
  - 0.5–1gm (5–10ml of a 10% solution) slow IVP over 3 to 5 minutes
- *Pediatric dose:*
  - *20mg/kg (0.15–3.0ml/kg of a 10% solution) slow IV push. Maximum dose = 1gm or 10ml*
- **Contraindications:**
  - Hypercalcemia
  - Digitalis toxicity
  - Renal or cardiac disease
- Pregnancy Category: Generally considered to be safe
- Side-effects/precautions
  - 

Extravasation may cause tissue damage and necrosis
  - Rapid injection may cause vasodilation, hypotension, bradycardia, cardiac dysrhythmia, syncope, and cardiac arrest
- Other notes:
  - 

Will precipitate if mixed with sodium bicarbonate
- TMEP use:
  - *Crush Injury Protocol*

Calcium Gluconate (Kalcinate®)

- **WARNING** GROUNDING medication for personnel on flight status.
- Description: Calcium salt
- Action:
  - Increased calcium levels
  - Has a role in the release of neurotransmitters and hormones
  - Increased cardiac contractile state
  - May increase ventricular automaticity
- Indications:
  - Acute hypocalcemia

- Acute hyperkalemia
- Calcium channel-blocker overdose

- Dose:
  - 1gm (10ml of a 10% solution)
  - 2.25–14mEq intravenously repeated in 1 to 2 minutes
- **Contraindications:**
  - Hypercalcemia
  - Digitalis toxicity.
  - Renal or cardiac disease
- Pregnancy class: Generally considered to be safe
- Side-effects/precautions
  - 

Extravasation may cause tissue damage and necrosis
  - Rapid injection may cause vasodilation, hypotension, bradycardia, cardiac dysrhythmia, syncope, and cardiac arrest
- Other notes:
  - 

Will precipitate if mixed with sodium bicarbonate
- TMEP use:
  - *Crush Injury Protocol*

Ceftriaxone Sodium (Rocephin®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: 3rd generation cephalosporin
- Broad spectrum bactericidal antibiotic for IV / IM use.
- Indications: Serious infections of the lower respiratory tract (i.e., pneumonia); urinary tract; skin infections; intra-abdominal infections (especially penetrating abdominal trauma); penetrating trauma to the extremities; & CNS infections
- Adult dose:
  - 1–2gm IM / IV daily or in divided doses bid; max dose 4gm/day
- *Pediatric dose:*
  - *50–75mg/kg given in divided doses q12 hours; max dose 2gm/day.*
-  K-9 Dose
  - 1gm IV / IM daily
- **Contraindications:**
  - Use caution in patients with a history of
    - Penicillin allergy
    - Hepatic dysfunction
    - Liver dysfunction
- Pregnancy Category B
- Side-effects:
  - Headaches
  - Dizziness
  - Nausea
  - Vomiting
  - Diarrhea

- Abdominal cramps
- Urticaria
- ↑ temperature

- Adverse reactions:
  - Eosinophilia
  - Thrombocytosis
  - Leukopenia
  - Injection Site
    - Pain
    - Induration
    - Sterile abscess
    - Tissue sloughing
    - Phlebitis
  - Thrombophlebitis with IV use
- Preparation procedure:
  - Withdraw 10cc NaCl from a 100cc bag. Inject 10cc NaCl into 1gm Rocephin vial. Mix.
  - Withdraw entire contents of vial and inject into original 100cc NaCl IV bag. Mix.
  - Piggyback with running IV.
  - 

If giving IM, reconstitute with 1% lidocaine **WITHOUT** epinephrine.

- TMEP use:
  - *Abdominal Pain Protocol*
  - *Bronchitis/Pneumonia Protocol*
  - *Dental Pain Protocol*
  - *Flank Pain (Renal Colic, Pyelonephritis, Kidney Stones) Protocol*
  - *Head and Neck Infection Protocol*
  - *Joint Infection Protocol*
  - *K-9 Trauma Management Protocol*
  - *Meningitis Protocol*
  - *Sepsis/Septic Shock Protocol*
  - *Tactical Trauma Protocol*
  - *Urinary Tract Infection Protocol*

Cephalosporins – General Antimicrobial Spectrum

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- 1st generation: Gram positive (including Staph aureus); basic gram negative coverage.
  - *Examples: cefazolin, cephalexin, cefadroxil*
- 2nd generation: Diminished Staph aureus, improved gram negative coverage compared to 1st generation; some with anaerobic coverage.
  - *Examples: cefotetan, cefoxitin, cefuroxime*
- 3rd generation: Further diminished Staph aureus; further improved gram negative coverage compared to 1st and 2nd generation; some with pseudomonas coverage and diminished gram positive coverage.
  - *Examples: ceftriaxone **(see Rocephin)**, cefotaxime, cefpodoxime, cefixime, cefoperazone.*
- 4th generation: Same as 3rd generation plus coverage against Pseudomonas.
  - *Example: cefepime*

Cerebyx® - See Fosphenytoin

Chloroquine Phosphate

- Indications:
  - Malaria due to *P. vivax*, *P. malariae*, *P. ovale*, and susceptible strains of *P. falciparum*.
- Dose
  - The dosage of chloroquine phosphate is often expressed in terms of equivalent chloroquine base. Each 500mg tablet of chloroquine phosphate contains the equivalent of 300mg chloroquine base.
- Adult dose:
  - Prophylaxis: 500mg (= 300mg base) on the same day of each week. Initiate therapy 1 to 2 weeks prior to departure to endemic area
  - Dose must be administered on same day of week
  - Continue prophylaxis for 4 additional weeks upon return from endemic area
  - Treatment: 1gm PO x1 then 500mg PO daily x 3 days starting 6 hours after first dose
- *Pediatric dose: The weekly suppressive dosage is 5mg calculated as base, per kg of body weight, but should not exceed the adult dose regardless of weight.*
- 

Precautions: Liver disease, blood disorders, psoriasis, a certain metabolic disease (glucose-6-phosphate dehydrogenase-G6PD deficiency), hearing problems, seizures.
- **Contraindications:** Known allergy to medication
- Pregnancy Category C – Generally accepted as safe.
- Side-effects
  - Nausea
  - Vomiting
  - Stomach upset
  - Cramps
  - Loss of appetite
  - Diarrhea
  - Blurred vision
  - Trouble seeing at night or problems focusing clearly
  - Easy bleeding or bruising.
- 

Warnings:
  - It has been found that certain strains of *P. falciparum* have become resistant to chloroquine and hydroxychloroquine. Chloroquine resistance is widespread and, at present, is particularly prominent in various parts of the world including sub-Saharan Africa, Southeast Asia, the Indian subcontinent, and over large portions of South America, including the Amazon basin[1].
  - Before using chloroquine for prophylaxis, it should be ascertained whether chloroquine is appropriate for use in the region to be visited by the traveler. Chloroquine should not be used for treatment of P. *falciparum* infections acquired in areas of Chloroquine resistance or malaria occurring in patients where Chloroquine prophylaxis has failed. Patients infected with a resistant strain of plasmodia, as shown by the fact that normally adequate doses have failed to prevent or cure clinical malaria or parasitemia, should be treated with another form of antimalarial therapy.
- Drug interactions
  - Ampicillin
  - Antacids
  - Cimetidine
  - Cyclosporine
  - Kaolin
  - Magnesium trisilicate.
- TMEP use
  - *Malaria Protocol*

Cialis® - see Tadalafil

Combivir® (Lamivudine and Zidovudine (AZT, ZDV))

- **WARNING** GROUNDING medication for personnel on flight status
- Indications: HIV infection
- Dose:
  - One Combivir tablet given twice daily
- **Contraindications:** Known allergy to medication.
- Pregnancy Category C
- Side-effects:
  - Cardiovascular:
    - Cardiomyopathy.
  - Endocrine and metabolic:
    - Gynecomastia
    - Hyperglycemia
  - Gastrointestinal:
    - Oral mucosal pigmentation
    - Stomatitis.
    - Nausea
    - Vomiting
    - Diarrhea
    - Decreased appetite
  - General:
    - Vasculitis
    - Weakness
    - Malaise and fatigue
    - Fever or chills
  - Heme and lymphatic:
    - Anemia, (including pure red cell aplasia and severe anemias)
    - Lymphadenopathy
    - Splenomegaly.
  - Hepatic and pancreatic:
    - Lactic acidosis
    - Hepatic steatosis
    - Pancreatitis
    - Posttreatment exacerbation of hepatitis B
  - Hypersensitivity:
    - Sensitization reactions (including anaphylaxis)
    - Urticaria
  - Musculoskeletal:
    - Muscle weakness
    - Myalgia
    - Arthralgia
    - Rhabdomyolysis.
  - Nervous:
    - Paresthesia
    - Peripheral neuropathy
    - Seizures
    - Dizziness
  - Respiratory:
    - Abnormal breath sounds
    - Wheezing

- Skin:
  - Alopecia
  - Erythema multiforme
  - Stevens-Johnson Syndrome.
- TMEP use:
  - *HIV Post Exposure Prophylaxis Protocol*

Decadron® – See Dexamethasone

Dexamethasone (Decadron®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Parenteral steroid (glucocorticoid)
- Indications:
  - Emergency treatment of AMS, HACE, HAPE, when tactical conditions preclude descent or acclimatization.
  - Use of Decadron ↓symptoms of AMS, but does not speed acclimatization.
  - Use of Decadron does not preclude the need for an emergency descent. (Administer Decadron every 6 hours until descent is accomplished)
  - Inflammatory conditions
  - Allergic conditions
- Dose (Human): 4mg IV / IM / PO q 6hr

- K-9 Dose:
  - 4mg IV / IM / PO q 6hr
- **Contraindications:**
  - Use caution in patients with a history of:
    - Diabetes
    - Hypertension
    - Ulcers
- Pregnancy Category C
- Side-effects:
  - Delayed wound healing
  - Acne
  - Various skin eruptions
  - Edema
- Adverse effects usually dose related
  - Psychotic behavior
  - Congestive heart failure
  - Hypertension
  - Cataracts
  - Glaucoma
  - Hypokalemia
  - Hyperglycemia
  - Carbohydrate intolerance
- TMEP use:
  - *Altitude Illness Protocol*
  - *Anaphylactic Reaction Protocol*
  - *Asthma (Reactive Airway Disease) Protocol*
  - *Contact Dermatitis Protocol*
  - *Head and Neck Infection, Including Epiglottitis, Protocol*
  - *K-9 High Altitude Sickness and Pulmonary Edema Protocol*
  - *Meningitis Protocol*

- *Sepsis/Septic Shock Protocol*
- *Smoke Inhalation Protocol*

Dextrose - See Glutose

Diamox® - See Acetazolamide

Diazepam (Valium®)

- GROUNDING medication for personnel on flight status
- Description: General CNS depressant (anticonvulsant/sedative). Benzodiazepine Class.
- Indications:
  - Acute anxiety
  - Seizures
  - Status epilepticus
  - Relaxation of skeletal muscle
  - Drug of choice for treatment of convulsions associated with chemical agents or organophosphates. NOTE: Successful treatment of convulsions from organophosphate or chemical exposure may require mass quantities and repeated administration of Diazepam (Valium).
  - Has **NO** analgesic or anesthetic properties.
  - Overdose may be reversed w/ Romazicon (Flumazenil)
- Dose:
  - Status Epilepticus: 5-10mg IV slow push
  - Acute anxiety: 5-15mg IV slow push
  - Relaxation of skeletal muscle: 5-15mg IV slow push
  - Chemical warfare: 10-15mg IV slow push
    - Auto injection Diazepam should be used for seizures induced by chemicals
- **Contraindications:**
  - ↓ BP
  - Acute narrow angle glaucoma
  - 

Has additive effect with other respiratory depressants (morphine, phenergan and alcohol). Be prepared to perform BLS.
- Pregnancy Category D
- Side-effects:
  - ↓ BP
  - ↓ Respirations
  - Drowsiness
  - Venous irritation
  - Pain at injection site
  - N & V
- Adverse reactions:
  - Bradycardia
  - CV collapse
  - Amnesia
  - Abdominal discomfort
- TMEP use:
  - *Back Pain Protocol*
  - *Behavioral Changes Protocol*
  - *Hyperthermia Protocol*
  - *Seizure Protocol*

Diflucan® - See Fluconazole

Diphenhydramine HCl (Benadryl®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Antihistamine. Prevents (but does not reverse) histamine-mediated responses. H1 blocker.
- Indications:
  - Mild to moderate allergic symptoms and/or allergic reactions
  - Dystonic reaction
- Adult dose:
  - 25-50mg IM / IV / PO q 6 hrs; max dose 400mg/day.
- *Pediatric dose:*
  - *(Children < 12 years): 5mg/kg/day in divided doses qid PO / IM / IV.*
- **Contraindications:**
  - Asthma
  - Pregnant or lactating females
- Pregnancy Category C
- Side-effects:
  - Sedation
  - Blurred vision
  - Nausea
  - Vomiting
  - Diarrhea
  - Headache
- Adverse reactions:
  - Insomnia
  - Vertigo
  - Palpitations
  - Dry mouth
  - Constipation
  - Dysuria
  - Urine retention
- TMEP Use:
  - *Allergic Rhinitis/Hay Fever/Cold Like Symptoms Protocol*
  - *Anaphylactic Reaction Protocol*
  - *Contact Dermatitis Protocol*
  - *Envenomation Protocol*
  - *Nausea and Vomiting Protocol*

Dulcolax® – See Bisacodyl

Efavirenz and Emtricitabine and Tenofovir – See Atripla®

Emtricitabine and Efavirenz and Tenofovir – See Atripla®

Emtricitabine and Tenofovir – See Truvada ®

Epinephrine (Adrenaline)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Alpha and beta adrenergic sympathomimetic.
  - First-line drug for anaphylaxis (See ACLS drugs for cardiac therapy)
  - Causes bronchodilatation, vasoconstriction, increases blood pressure.
  - Decreases edema/swelling due to allergic reactions.
    - NOTE:
      - 1:1,000 dilution epinephrine (1mg in 1cc) is standard pararescue issue.
      - 1:10,000 dilution (1mg in 10cc) is the standard 'Cardiac' dosage form for IV use.
      - 1:1,000 epinephrine can be diluted to the 1:10,000 form by putting 1cc of 1:1,000 epinephrine (1mg epinephrine) in 9cc of normal saline (total volume of 10cc).
- Indications: Anaphylaxis
  - Allergic reactions (mild/moderate/severe)
  - Asthma
- Adult dose (Epinephrine):
  - Anaphylaxis: 0.3-0.5mg (3-5cc of 1:10,000 dilution) IV or 0.3-0.5mg (0.3-0.5cc of 1:1,000 dilution) IM
  - Allergic reaction: 0.3-0.5mg (0.3-0.5cc of 1:1,000 dilution) SQ / IM
  - Asthma: 0.3-0.5mg (0.3-0.5cc of 1:1,000 dilution) SQ / IM
- *Pediatric dose: 0.01mg/kg SQ / IM. Not to exceed 0.5mg*
- **Contraindications:**
  - **1:1,000 Epinephrine is NOT given IV.**
  - Use caution in patients with a history of heart disease or over the age of 40.
  - Do not inject Epinephrine (or solutions containing Epi) into/near the fingers, toes, nose, ears or penis. Intense vasoconstriction may cause necrosis.
- Pregnancy Category C
- Side-effects:
  - Cardiac arrhythmias
  - Ventricular tachycardia
  - Ventricular fibrillation
  - Angina
  - Hypertension
  - ↑BP
  - Nausea
  - Vomiting
  - Vasoconstriction
- Adverse reactions
  - Uncontrolled effects on myocardium & arterial system
- TMEP use:
  - *Anaphylactic Reaction Protocol*
  - *Asthma (Reactive Airway Disease) Protocol*
  - *Sepsis/Septic Shock Protocol*

Ertapenem IV (Invanz®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.

- Description: Carbapenem antibiotic
- Indications
  - Complicated intra-abdominal infections
  - Complicated skin infections
  - Pneumonia
  - Complicated UTI, including pyelonephritis
  - Acute pelvic infections
  - **Drug of choice for penetrating battlefield trauma**
- Adult dose
  - 1gm daily
  - May be administered IV up to 14 days or IM injection for up to 7 days
  - For IV administration, infuse over 30 minutes
- *Pediatric dose*
  - *Not approved in patients < 18 yrs*
-  K-9 Dose
  - 250mg IV / IM three times a day
- **Contraindications:**
  - Hypersensitivity to ertapenem
  - Penicillin allergy with documented severe reaction to PCN
  - Hypersensitivity to other carbapenem antibiotics
  - Anaphylactic reactions to other beta-lactam antibiotics
  - IM: hypersensivity to lidocaine or other anesthetics of amide-type
- Pregnancy Category B
- Side-effects:
  - Diarrhea
  - Infused vein phlebitis/thrombophlebitis
  - Nausea/ vomiting
  - Headache
  - Vaginitis
- Adverse reactions:
  - Seizures
- Other notes:
  - Visually inspect any solution of ertapenem for particulate matter and discoloration prior to use when possible. Solutions range in color from colorless to pale yellow. Variations in color do not affect potency of the drug.
  - IV administration – must be reconstituted prior to administration
    - Do not mix or co-infuse with other medications
    - Do not use diluents containing dextrose
    - Reconstitute the contents of a 1gm vial of ertapenem with 10ml of 0.9% NaCl, or bacteriostatic water for injection
    - Shake well to dissolve, and immediately transfer contents to 50ml of 0.9% NaCl
    - Complete infusion within 6 hrs of reconstitution
  - IM administration - must be reconstituted prior to administration
    - Reconstitute the contents of a 1gm vial of ertapenem with 3.2ml of 1% lidocaine HCl injection (without epinephrine). Shake vial thoroughly to form solution
    - Immediately withdraw the contents of the vial, and administer by deep IM injection into a large muscle mass (such as the gluteal muscles or lateral part of the thigh)
    - Use the reconstituted IM solution within 1 hour after preparation. **DO NOT ADMINISTER THE RECONSTITUTED IM SOLUTION IV.**
- TMEP use:
  - *Abdominal Pain Protocol*
  - *Bronchitis/Pneumonia Protocol*
  - *Cellulitis/Cutaneous Abscess Protocol*
  - *Crush Injury Protocol*
  - *Flank Pain (Renal Colic, Pyelonephritis, Kidney Stone) Protocol*

- *Joint Infection Protocol*
- *K-9 Trauma Management Protocol*
- *Meningitis Protocol*
- *Sepsis/Septic Shock Protocol*

Fentanyl – See Oral Fentanyl

Flagyl® – See Metronidazole

Fluroquinolones – See Quinolones, Moxafloxacin, Gatifloxacin, Levofloxacin

Fluconazole (Diflucan®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antifungal therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: Synthetic triazole antifungal agent
- Indications:
  - Vaginal candidiasis (vaginal yeast infections due to *Candida*).
  - Oropharyngeal and esophageal candidiasis.
  - Fungal skin infections
- Dose:
  - Skin infection: 150mg, 1 pill per week x 4 weeks
  - Single dose: Vaginal candidiasis: The recommended dosage of fluconazole for vaginal candidiasis is 150mg as a single oral dose.
  - Oropharyngeal candidiasis: The recommended dosage of fluconazole for oropharyngeal candidiasis is 200mg on the first day, followed by 100mg once daily. Clinical evidence of oropharyngeal candidiasis generally resolves within several days, but treatment should be continued for at least 2 weeks to decrease the likelihood of relapse.
- **Contraindications:**
  - Hypersensitivity to fluconazole.
- Pregnancy Category C
- Side-effects/adverse reactions:
  - *Dermatologic:*
    - Exfoliative skin disorders including Stevens-Johnson Syndrome and toxic epidermal necrosis.
- TMEP use:
  - *Fungal Skin Infection Protocol*

Fosphenytoin (Cerebyx®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Parenteral phenytoin
- Indications:
  - Prevention and treatment of seizures
- Dose: 18mg/kg IV/IO over 15 minutes (if available) for seizures refractory to benzodiazepines.

- **Do not administer faster than 150mg/min since this may result in hypotension.**
- **Contraindications:**
  - Hypersensitivity to phenytoin
  - Sinus bradycardia
  - AV block
- Pregnancy Category D
- Adverse Effects
  - Hypotension with rapid IV administration
- Other Notes
  - **Store under refrigeration at 2° C to 8° C (36° F to 46° F). The product should not be stored at room temperature for more than 48 hours.**
  - **Vials that develop particulate matter or are discolored should not be used.**
  - Because the full antiepileptic effect of phenytoin, whether given as Cerebyx or parenteral phenytoin, is not immediate, other measures, including concomitant administration of an IV benzodiazepine, will usually be necessary for the control of status epilepticus
- TMEP Use:
  - *Seizure Protocol*
  - *Tactical Trauma Protocol*

Gatifloxacin 0.3% Ophthalmic Liquid (Zymar®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: Ocular fluoroquinolone
- Indications: Eye infections
- Adult dose
  - Days 1 and 2: instill 1 drop in affected eye(s) every 2 hours while awake, up to 8 times/day
  - Days 3 to 7: Instill 1 drop in affected eye(s) up to 4 times/day while awake
- *Pediatric dose*
  - *Safety and efficacy in infants < 1 year not established*
  - *Pediatric dosing like adult dosing*
- **Contraindications**
  - Hypersensitivity to any component of product
- Pregnancy Category C
- Side-effects
  - Upon instillation, may cause temporary blurring of vision or stinging
  - If stinging, burning, or itching becomes pronounced, or redness, irritation, swelling, decreasing vision, or pain persists or worsens, discontinue and consider alternative therapy
  - Lid margin crusting, white crystalline precipitates and foreign body sensation in the eye have been reported
  - Bad/bitter taste in mouth
  - Nausea
- Adverse reactions
  - Discontinue at first sign of skin rash or other allergic reaction
  - Corneal staining
  - Tearing and photophobia
- Other notes:
  - To instill in eye, tilt head back, place medication in conjunctival sac and close eye(s).
  - Apply light finger pressure on lacrimal sac for 1 minute following instillation

- To avoid bottle contamination, do not touch tip of container to any surface. Replace cap after use.
- In general, contact lenses should not be worn during therapy

- TMEP use:
  - *Corneal Abrasion, Corneal Ulcer, Conjunctivitis Protocol*
  - *Ear Infection Protocol*

Glutose® – See Glucose

Glucose (Glutose®)

- Description: Carbohydrate
- Route: Oral
- Indications: Altered mental status caused by hypoglycemia defined as:
  - Adults:
    - Diabetics = fingerstick blood glucose analysis less than 110mg/dL
    - Non-diabetics = fingerstick blood glucose analysis less than 80mg/dL
  - Children:
    - Diabetics = fingerstick blood glucose analysis less than 90mg/dL
    - Non-diabetics = fingerstick blood glucose analysis less than 60mg/dL
- Adult dose
  - Full tube given in small doses (25-50gm) – standing order
- *Pediatric dose:*
  - *0.5gm/kg in small doses – standing order*
- Drug action: Increases blood glucose level
- Onset:1 minute
- Duration: Depends on the degree of hypoglycemia
- Precautions: Assure gag reflex is present
- Side-effects:
  - Aspiration
- **Contraindications:**
  - Absent gag reflex
  - Patients who are unable to protect their own airway
  - Patients who are unable to swallow
- Pregnancy Category C
- TMEP use:
  - *Behavioral Changes Protocol*
  - *Hyperthermia Protocol*
  - *Loss of Consciousness* (without seizures) *Protocol*
  - *Seizure Protocol*

Hespan® (Hetastarch in NaCl) Plasma Volume Expander (Artificial Colloid)
Hextend® (Hetastarch in Lactated Electrolyte Solution)

- Description: Plasma volume expander (artificial colloid)
- Both Hespan and the newer product Hextend are artificial colloids and are used to expand the plasma volume. The major advantage over crystalloids is that these products give more volume expansion for a longer period of time for the same infused volume. These products are not blood or plasma replacements, they have no oxygen carrying capacity, and they have no coagulation properties. **These products should not be the primary fluid used to treat dehydrated patients, but can be used if no other fluids are available.**
- Indications: Treatment of shock secondary to hemorrhage.
- Dose:
  - Patient in shock, bleeding not controlled: hold fluid and control bleeding.
  - Patient in shock, bleeding controlled: start 500cc of Hespan/Hextend IV, check for improvement in BP.

        - Titrate to SBP of 85 **OR** improvement in mental status **AND** presence of radial pulse. Hold further fluid when either improvement point is met.
    - Patient still in shock after first 500cc of Hespan/Hextend; start second 500cc bag and titrate to improvement.
    - .
- **Contraindications:**
    - Known bleeding disorders or uncontrolled hemorrhage
    - CHF
    - Renal impairment
    - Not for use in children under 12 years
    - Use with caution in pregnancy.
- Pregnancy Category C
- Side-effects:
    - Nausea/vomiting
    - Peripheral and facial edema
    - Urticaria
    - Flushing chills
- Adverse reactions:
    - Severe anaphylaxis (rare)

Ibuprofen (Motrin®)

- Description: NSAID, analgesic, antipyretic. Cox-1 inhibitor.
- Indications:
    - Mild to moderate pain
    - Arthritis
- Dose:
    - 200-800mg PO tid or qid. Not to exceed 2400mg/day (800mg tid)
- **Contraindications:**
    - NOTE: Should not be given to pts with a history of aspirin sensitivity or severe asthma
    - Penetrating trauma
    - Suspected internal bleeding
    - Suspected intracranial bleeding
    - Pregnancy
    - Nursing mothers
- Pregnancy Category B
- Side-effects:
    - Nausea
    - Vomiting
    - Headache
    - Dizziness
    - Drowsiness
- Adverse reactions:
    - Prolonged bleeding time
    - Tinnitus
    - Edema
    - Peptic ulcer
- TMEP use:
    - *Chest Pain Protocol* (Other Etiologies)
    - *Pain Management Protocol*

Imodium ®– See Loperamide HCl

Invanz® - See Ertapenem IV

Kalcinate® - See Calcium Gluconate

Kaletra® (Lopinavir and Ritonavir)

- **WARNING** GROUNDING medication for personnel on flight status.
- Class: Protease inhibitors.
- Action: This medication prevents human immunodeficiency virus (HIV) cells from multiplying in your body
- Indications: HIV treatment
- Dose: 4 pills daily, taken together and with Truvada
- **Contraindications:**
  - Do not take the following medicines with KALETRA because they can cause serious problems or death.
    - Triazolam (Halcion®)
    - Astemizole (Hismanal®)
    - Pimozide (Orap®)
    - Cisapride (Propulsid®)
    - Terfenadine (Seldane®)
    - Midazolam (Versed®)
    - Rifampin (Rimactane®, Rifadin®, Rifater®, or Rifamate®)
    - Cholesterol lowering medicines
      - Lovastatin (Mevacor®)
      - Simvastatin (Zocor®)
      - Atorvastatin (Lipitor®)
- Pregnancy Category C
- Side-effects/precautions:
  - Body as a whole
    - Allergic reaction, back pain, chest pain, chest pain substernal, cyst, drug interaction, drug level increased, face edema, flu syndrome, hypertrophy, infection bacterial, malaise, neoplasm, and viral infection.
  - Cardiovascular system
    - Atrial fibrillation, cerebral infarct, deep vein thrombosis, migraine, myocardial infarct, palpitation, postural hypotension, thrombophlebitis, varicose vein, and vasculitis
  - Digestive system
    - Cholangitis, cholecystitis, constipation, dry mouth, enteritis, enterocolitis, eructation, esophagitis, fecal incontinence, gastritis, gastroenteritis, hemorrhagic colitis, hepatitis, hepatomegaly, increased appetite, jaundice, liver fatty deposit, liver tenderness, mouth ulceration, pancreatitis, periodontitis, sialadenitis, stomatitis, and ulcerative stomatitis.
  - Endocrine system
    - Cushing's Syndrome, diabetes mellitus, and hypothyroidism.
  - Heme and lymphatic system
    - Anemia, leukopenia, and lymphadenopathy.
  - Metabolic and nutritional disorders
    - Avitaminosis, dehydration, edema, glucose tolerance decreased, lactic acidosis, obesity, peripheral edema, and weight gain.
  - Musculoskeletal system
    - Arthralgia, arthrosis, bone necrosis, joint disorder, and myasthenia.
  - Nervous system
    - Abnormal dreams, agitation, amnesia, anxiety, apathy, ataxia, confusion, convulsion, dizziness, dyskinesia, emotional lability, encephalopathy, extrapyramidal syndrome, facial paralysis, hypertonia, nervousness, neuropathy, peripheral neuritis, somnolence, thinking abnormal, tremor, and vertigo.
  - Respiratory system

        - Asthma, cough, increased dyspnea, lung edema, pharyngitis, rhinitis, and sinusitis.
    - Skin and appendages
        - Acne, alopecia, dry skin, eczema, exfoliative dermatitis, furunculosis, maculopapular rash, nail disorder, pruritis, seborrhea, skin benign neoplasm, skin discoloration, skin striae, skin ulcer, and sweating.
    - Special senses
        - Abnormal vision, eye disorder, otitis media, taste loss, taste perversion, and tinnitus.
    - Urogenital system
        - Abnormal ejaculation, amenorrhea, breast enlargement, gynecomastia, impotence, kidney calculus, nephritis, and urine abnormality.
- Other notes:
    - Store KALETRA soft gelatin capsules at 36° F - 46° F (2° C - 8° C) until dispensed. Avoid exposure to excessive heat. For patient use, refrigerated KALETRA capsules remain stable until the expiration date printed on the label. If stored at room temperature up to 77° F (25° C), capsules should be used within 2 months.
- TMEP use:
    - *HIV Post Exposure Prophylaxis Protocol*

Ketalar® - See Ketamine

Ketamine (Ketalar®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Rapid acting general sedative and analgesic
- Indications:
    - Anesthetic agent for procedures
- Adult Dose: 20mg IV/IO over 1 minute, followed by 20mg increments every 30-60 seconds until nystagmus occurs or a maximum total dose of 100mg.
    -  **Do not administer faster as this may result in respiratory depression.**
- **Contraindications:**
    - Hypersensitivity to ketamine
    - Eye globe injury
    - Head injury
- Pregnancy Category B
- Adverse Effects
    - Hypertension
    - Respiratory Depression
    - Emergence Reactions (delirium, hallucinations, confusion)
    - Increased Intra-cranial pressure
    - Increased intra-ocular pressure
    - Hypersalivation
- Other Notes
    - Do not mix ketamine hydrochloride and diazepam in syringe or infusion bottle
    - Ketamine **should not** be injected intravenously without proper dilution. It is recommended the drug be diluted with an equal volume of either Sterile Water for Injection, USP, Normal Saline, or 5% Dextrose in Water.
    - Protect from light
    - Effects of ketamine are increased when combined with other analgesics or muscle relaxants
    - **Vials that develop particulate matter or are discolored should not be used.**

- TMEP Use:
  - *Procedural Analgesia Protocol*

Ketorolac (Toradol®)

- Description: Analgesic, non-steroidal anti-inflammatory (NSAID). Inhibits platelet function.
- Indications:
  - For the temporary relief of:
    - Mild to moderate pain
    - Fever (if ASA or Acetaminophen is not available).
- Adult dose:
  - 30mg IV / IM. May be repeated q 6hr. ***Do not use more than 5 consecutive days.***
- *Pediatric dose*
  - *Adolescents 13–16 years and children 2–12 years: 1mg/kg IM to a maximum of 30mg or 0.5mg/kg IV to a maximum of 15mg*
- **Contraindications**:
  - Hypersensitivity to nonsteroidal anti-inflammatory agents (NSAID)
  - History of gastrointestinal bleeding
  - Patients with bleeding disorders (e.g., hemophilia).
  - Suspected or confirmed
    - Cerebrovascular bleeding
    - Hemorrhagic diathesis
    - Incomplete hemostasis
    - High risk of bleeding
  - Prior to major surgery
  - Exercise extreme caution in patients with a history of
    - Hypertension or hypertension and congestive heart failure.
    - Cardiovascular disease
    - Peripheral vascular disease
    - Cerebrovascular disease (e.g., stroke, transient ischemic attack)
  - Advanced renal impairment
  - Patients at risk for renal failure due to volume depletion
- Pregnancy Category B
- Side-effects:
  - Gastrointestinal symptoms
  - Gastrointestinal bleeding
  - Stomach pain
  - Heartburn
- TMEP use:
  - *Pain Management Protocol*

Lamivudine and Zidovudine (AZT, ZDV) - See Combivir®

Lariam® – See Mefloquine

Lidocaine HCL – See Xylocaine®

- **WARNING** Aviation personnel are grounded for 12 hours after the use of local anesthesia and until symptoms have resolved enough to allow safe performance of duties.
- Description: Local anesthetic; see ACLS drugs for cardiac therapy.

- CAUTION: Some lidocaine solutions contain 1:10,000 epinephrine. This causes intense vasoconstriction and prolongs the duration of the anesthesia. These solutions are identified by a red label or red lettering on the label. **DO NOT use solutions containing epinephrine on or near the fingers, toes, nose, ears, or penis.**
- Indications:
  - Local anesthetic: Suturing, debridement, nerve blocks, thoracostomy, or other similar procedures. Duration of anesthesia is 30 to 60 minutes.
  - Cardiac Use: Use ACLS Protocols
- Dose (Local anesthesia): To desired effect. Maximum single adult dose is 4.5mg/kg or 300mg (15cc of the 2% solution contains 300mg lidocaine).
    - NOTE 1: This is a different max dose than with IV lidocaine for ACLS use.
    - NOTE 2: 2% lidocaine contains 20mg of lidocaine per cc. Diluting 2% lidocaine 1:1 with normal saline gives a 1% solution (10mg per cc) that is just as effective as the 2% solution.
- **Contraindications:**
  - 2nd degree, 3rd degree AV block
  - Hypotension
  - Stokes-Adams Syndrome
- Pregnancy Category B
- Side-effects:
  - Slurred speech
  - Altered mental status
  - Tinnitus
  - Edema
- Adverse Reactions:
  - Dermatologic reactions
  - Status asthmaticus
  - Anaphylaxis
  - Seizures
- TMEP use:
  - *Back Pain Protocol*
  - *Cellulitis/Cutaneous Abscess Protocol*
  - *Ingrown Toenail Protocol*

Loperamide HCl (Imodium®)

- **WARNING** Aviation personnel are grounded until medical condition is not a factor and free of side-effects for 24 hours.
- Description: Antidiarrheal (opioid)
- Indications: Treatment of acute diarrhea. For use in acute, non-invasive diarrhea only.
  - Refer to medical emergencies if blood and/or mucus are present in stool, or diarrhea is associated with fever (infectious diarrhea).
- Dose: 2 capsules (4mg) first dose, then 1 capsule (2mg) after every unformed stool, not to exceed 16 mg (8 capsules) in 24 hours. Use only if control of diarrhea is critical for continued operations.
- **Contraindications:**
  - Acute dysentery.
  - Not for use in children < 12 years old
- Pregnancy Category B
- Side-effects:
  - Abdominal pain/distention

- Nausea
- Vomiting
- Severe constipation
- Drowsiness
- Dizziness.

- Adverse reactions: Hypersensitivity
- TMEP use:
  - *Gastroenteritis Protocol*

Lopinavir and Ritonavir – See Kaletra®

Macrolide Class of Antibiotics – See Azithromycin (Z-Pak®)

Malarone® - See Atovaquone 250mg/ proguanil 100mg

Mannitol (Osmotrol®)

- **WARNING** GROUNDING medication for personnel on flight status.
- Description: Osmotic diuretic
- Action:
  - Increases osmolarity of the glomerular filtrate, which increases the reabsorption of water, increasing sodium and chloride.
- Indications:
  - Crush injury
- Dose:
  - 1-2gm/kg at the rate of 5gm/hr
- **Contraindications:**
  - Anuria
  - Pulmonary edema
  - Dehydration
  - Congestive heart failure
  - Hypovolemia
  - Hypotension
  - Hypersensitivity
- Pregnancy Category C
- Side-effects/precautions
  - Sodium depletion
  - Transient volume overload
  - Pulmonary edema
  - Hypotension (excessive diuresis)
  - Angina like chest pain
  - Dizziness
  - Headache
  - Nausea and vomiting
  - Chills
  - Drug may crystallize at temperatures of 45° F or lower
- Other notes:
  - 

Use an in line filter
- TMEP use:
  - *Crush Injury Protocol*

Mefloquine (Lariam®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Antimalarial agent
- Indications:
  - Prevention of mild to moderate malaria caused by *Plasmodium falciparum* (including chloroquine-resistant strains) and *P. vivax*
  - Treatment of mild to moderate malaria caused by Mefloquine-susceptible strains of *P. falciparum* (both chloroquine-susceptible and resistant strains) and *P. vivax*
- Adult dose:
  - Prophylaxis: 250mg once weekly
    - Initiate therapy 1 to 2 weeks prior to departure to endemic area
    - Dose must be administered on same day of week
    - Continue prophylaxis for 4 additional weeks upon return from endemic area
  - Treatment: 5 tablets (1250mg) given as a split dose taken 6-8 hours apart.
  - Do not take on empty stomach
  - Take with at least 240ml (8oz) glass water
- *Pediatric dose*
  - *Prophylaxis:*
    - *Children > 45kg: one 250mg tablet should be taken in children*
    - *Children <45kg: weekly dose decreases in proportion to body weight (3 to 5mg/kg once weekly):*
      - *30–45kg: ¾ tablet*
      - *>20–30kg: ½ tablet*
      - *Up to 20kg: ¼ tablet*
      - *Experience with Mefloquine in infants < 3 months or weighing < 5mg is limited*
    - *Initiate therapy 1 week prior to departure to endemic area*
    - *Dose must be administered on same day of week*
    - *Continue prophylaxis for 4 additional weeks upon return from endemic area*
  - *Treatment: 20–25mg/kg for nonimmune patients*
    - *Splitting the dose into 2 doses taken 6-8 hours apart may reduce adverse effects*
    - *Treatment in children has been associated with early vomiting; if patient vomits within 30 minutes of dose and a significant loss of drug is suspected by inspection of emesis, re-dose patient with full dose; if vomiting occurs within 30 to 60 minutes, administer ½ the full dose.*
    - *Do not administer on an empty stomach and give with ample water*
    - *For very young patients, dose may be crushed, mixed with water or sugar water and may be administered via oral syringe*
    - *Experience in infants < 3 months or < 5kg is limited*

- **Contraindications:**
  - Hypersensitivity to related compounds (e.g., quinine, quinidine)
  - Patients with:
    - Active depression
    - Recent history of depression
    - Generalized anxiety disorder
    - Psychosis
    - Schizophrenia or other major psych disorders
    - History of convulsions
- Pregnancy Category C
- Side-effects:
  - Cardiac rhythm disturbances
  - Exercise caution when performing activities requiring alertness and fine motor coordination such as driving, piloting, operating heavy machinery as dizziness, loss of balance have occurred with Mefloquine during and following its use

- Adverse reactions:
  - Reactions (symptoms) attributable to Mefloquine cannot be distinguished from symptoms of malaria. Due to long half-life of the drug, symptoms could persist for several weeks following the last dose.
  - Prophylaxis
    - Vomiting (3%)
    - Dizziness
    - Syncope (fainting)
    - Extrasystoles (skipped heartbeats; <1%)
  - Treatment
    - Dizziness, headache
    - Myalgia (muscle aches)
    - Nausea, vomiting
    - Fever, chills
    - Diarrhea
    - Skin rash
    - Abdominal pain
    - Fatigue
    - Loss of appetite
    - Tinnitus (ringing in the ears)
- Other notes:
  - Patients given Mefloquine for *P. vivax* are at high risk for relapse and should subsequently receive Primaquine.
  - There is insufficient clinical data to document Mefloquine's effect on malaria caused by *P. ovale* or *P. malariae*
  - Liver impairment can prolong the elimination of Mefloquine
  - When Mefloquine is taken concurrently with oral live typhoid vaccines, attenuation of immunization cannot be excluded. Therefore, complete attenuated oral live vaccinations at least 3 days before starting Mefloquine.
  - Anticonvulsant blood levels (e.g., phenytoin [Dilantin®], valproic acid [Depakote®], carbamazepine [Tegretol®], and phenobarbital) may be reduced by Mefloquine and therefore risk for convulsions may increase in patients with history of epilepsy. Mefloquine itself has also been associated with convulsions in the absence of anticonvulsant treatment.
- TMEP use:
  - *Malaria Protocol*

Meloxicam (Mobic®)

- Description: NSAID
- Indications:
  - Relief of the signs and symptoms of osteoarthritis and rheumatoid arthritis.
  - Mild to moderate pain relief
- Dose:
  - 7.5mg or 15mg daily. The maximum recommended daily oral dose is 15mg.
- **Contraindications**:
  - Allergy to NSAID class of drugs, Aspirin.
- Pregnancy Category B (1st and 2nd trimesters)
- Pregnancy Category C (3rd trimester)
- Side-effects:
  - Allergic reaction
  - Anaphylactoid reactions including shock
  - Face edema
  - Fatigue
  - Fever
  - Hot flushes
  - Malaise
  - Syncope
  - Weight decrease

- Weight increase
- Dyspepsia

- TMEP use:
  - *Pain Management Protocol*

Metronidazole (Flagyl®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: Nitroimidazole antibiotic
- Indications:
  - Gastroenteritis presumed due to Giardia
- Adult dose:
  - Amebic Dysentery – 750mg PO tid x 5–10 days
  - Trichomoniasis – 2gm PO x 1 dose; OR 250mg PO tid x 7 days
  - Giardia – 250mg PO tid x 5–7 days
  - Severe anaerobic infections – 1gm IV, the 500mg IV q 6 hr
- *Pediatric dose:*
  - *Safety and efficacy have not been established, except for amebiasis. 35–50mg/kg tid for 10 days. Newborns exhibit a reduced capacity to eliminate the drug.*
- **Contraindications:**
  - Hypersensivity to any component of product, or other nitroimidazole derivatives
  - Pregnancy (first trimester in patients with Trichomoniasis)
  - Administer with caution to patients with CNS diseases
  - Use with caution in patients with history of blood dyscrasias
- Pregnancy Category B
- Side-effects:
  - Disulfiram-like reaction including flushing, palpitations, tachycardia, nausea, vomiting may occur with concomitant ethanol ingestion. Refrain from ethanol during therapy and ≥1 to 3 days afterward.
- Adverse reactions:
  - Seizures
  - Peripheral neuropathy (numbness or paresthesia of extremity)
  - Patients with undiagnosed candidiasis may present more prominent symptoms during therapy; treat with candicidal agent
- TMEP use:
  - *Abdominal Pain Protocol*
  - *Gastroenteritis Protocol*

Midazolam (Versed®)

- **WARNING** GROUNDING medication for personnel on flight status
- Class: Benzodiazepine
- Indications:
  - Sedation in combination with analgesia to perform brief, but painful procedures (i.e. fracture reduction)
  - Treatment of active seizures
  - Sedation of agitated patients
- Dose:
  - 0.07-0.08mg/kg IM (Average or typical adult dose is 5mg IM)
  - 5-10mg IM / IV / IO for seizure control

- 1mg IV slowly q 2-3 minutes to maximum adult dose of 10mg for sedation purposes. Titrate to achieve necessary level. (The patient is somewhat somnolent, but still easily arousable.)

- Side-effects:
  - Respiratory: laryngospasm, bronchospasm, wheezing, shallow respirations,
  - Cardiovascular: bradycardia, tachycardia
  - Gastrointestinal: vomiting
  - CNS/neuromuscular: retrograde amnesia, hallucination, confusion
  - Special senses: blurred vision, diplopia, nystagmus, pinpoint pupils,
  - Hypersensitivity: anaphylactoid reactions, hives, rash, pruritus.
  - Miscellaneous: yawning, lethargy, chills, weakness
- **Contraindications:**
  - Known sensitivity to midazolam
  - Acute narrow angle glaucoma
  - Injectable midazolam should not be administered to adult or pediatric patients in shock or coma, or in acute alcohol intoxication with depression of vital signs
- Pregnancy Category D
- 

Warnings:
  - Use with caution when other medications capable of producing central nervous system depression are used.
  - Prior to the intravenous administration of midazolam be sure that the immediate availability of oxygen, resuscitative drugs, age and size-appropriate equipment for bag/valve/mask ventilation and intubation, and skilled personnel for the maintenance of a patent airway and support of ventilation are available.
  - Monitor patients continuously for early signs of hypoventilation, airway obstruction, or apnea.
  - Use with caution in patients with severe fluid or electrolyte disturbances.
  - Oxygen is desirable, but not absolutely required.
- Overdose treatment:
  - Flumazenil may be used to reverse the effects of midazolam after accidental over-administration. Flumazenil should not be used to reverse midazolam after seizure treatment since this may result in intractable seizures. It should also not be used in the setting of an intentional or mixed drug overdose.
  - Monitor vital signs during the recovery period.
- TMEP uses:
  - *Acute Behavioral Changes Protocol*
  - *Seizures Protocol*

Mobic® – See Meloxicam

Motrin® – See Ibuprofen

Morphine Sulfate (Opioid)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Narcotic analgesic – alters perception of pain and emotional response to pain.
- 

  - Have Narcan available when using Morphine.
  - Alters perception & emotional response to pain
- Indications:

- Severe pain
- Pain from cardiac ischemia

- **Contraindications:**
  - Respiratory depression
  - Hypotension
  - Head injury
- Pregnancy Category B
- Adult dose: 4-15mg IV / IM slow push. Titrate to response.
- *Pediatric dose: 0.1-0.2mg/kg IM / IV. Do not exceed 15mg.*
-  K-9 Dose:
  - Acute Pain: 30mg IM
  - Sedation: 15-30mg IM
- Side-effects:
  - ↓ RR
  - Hypotension
  - Bradycardia
  - Nausea
  - Vomiting
  - Dizziness
  - Pruritus
  - Skin flushing
- Adverse reactions:
  - Seizures with large doses
  - Constipation
  - Ileus
  - Urinary retention
- TMEP use:
  - *Chest Pain Protocol*
  - *Pain Management Protocol*
  - *K-9 Trauma Management Protocol*

Moxifloxacin (Avelox®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: 4th generation quinolone
- Broad spectrum antibiotic with broad anaerobic coverage for PO / IV administration). Inhibits DNA preventing cellular replication and division
- Indications:
  - Community-acquired pneumonia (CAP), including CAP caused by multi-drug resistant *Streptococcus pneumoniae**
  - Complicated skin and skin structure infections, including diabetic foot infections
  - Complicated intra-abdominal infections, including polymicrobial infections such as abscesses
- Dose: 400mg/day PO / IV
  - IV infusion should be over 60 minutes
  - Avoid use with antacids;
  - Decrease dose in renal impairment
  - Avoid using with antiarrhythmics – May cause prolonged QT interval
- **Contraindications:**
  - Hypersensitivity to fluroquinolones

- Patients < 18 years old
- Pregnancy and lactation
- Uncorrected hypokalemia

- Pregnancy Category C
- Side-effects:
  - Headache
  - Nausea
  - Diarrhea
  - Photosensitivity
  - Insomnia
  - Vertigo,
- Adverse reactions:
  - Tendon rupture
  - Use cautiously with NSAIDs due to increased CNS stimulation
  - Prolonged QT interval
  - Abnormal dreams
  - Pseudomembranosus colitis
- Other notes:
  - 

Oral antacids decrease absorption of the Moxafloxacin when taken orally.
  - Visually inspect any solution of Moxafloxacin for particulate matter and discoloration prior to use. Solution must be clear.
  - IV administration- must be reconstituted prior to administration
    - Do not mix or co-infuse with other medications
    - At cool temperatures precipitation may occur, which will re-dissolve at room temperature.
- TMEP use:
  - *Barotrauma Protocol*
  - *Bronchitis/Pneumonia Protocol*
  - *Cellulitis/Cutaneous Abscess Protocol*
  - *Ear Infection Protocol*
  - *Epistaxis Protocol*
  - *Flank Pain* (Renal Colic, Pyelonephritis, Kidney Stone) *Protocol*
  - *Gastroenteritis Protocol*
  - *Ingrown Toenail Protocol*
  - *Meningitis Protocol* (Prophylaxis)
  - *Subungual Hematoma Protocol*

Mupirocin Ointment 2% (Bactroban®)

- Description: Topical antibacterial
- Indications:
  - Impetigo
  - Topical skin infection
- Adult dose:
  - Clean affected area
  - Apply small amount of antibiotic on the area 1 to 3 times/day
  - The affected area may be covered by gauze or a sterile bandage
- *Pediatric dose:*
  - *Safety in children has been established in ages 2 to 16 yrs*
  - *Pediatric dosing like adult dosing*
- **Contraindications:**
  - Should not be used with open wounds
- Pregnancy Category B
- Side-effects:
  - Burning, stinging, pain, itching at application site
  - Adverse reactions

- Nausea
- Adverse reactions:
  - Dry skin
  - Tenderness
  - Swelling
  - Contact dermatitis
  - Increased exudate (rare)
  - Systemic reactions (rare)
- Other notes:
  - For external use only
  - Avoid eyes and mucosal membranes
  - If no improvement in 3 to 5 days, consider alternative therapy
- TMEP use:
  - *Epistaxis Protocol*
  - *Ingrown Toenail Protocol*

Narcan® – See Naloxone HCl

Naloxone HCl (Narcan®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Narcotic antagonist.
- Indications: Known or suspected narcotic induced respiratory depression.
  - 

Have available when using Morphine.
- Adult dose: 0.4-2mg IV. Repeat q 2-3 min/prn.
  - Duration is 20 to 40 minutes (< duration of action of Morphine). Repeat doses of may be necessary after 20 to 30 minutes.
- *Pediatric dose: 0.01mg/kg dose IM / IV / SQ q 2-3 min.*
  - *If initial dose does not result in clinical response, increase dose up to 0.1mg/kg*
  - *If no response after 10mg has been administered, diagnosis of narcotic induced toxicity should be questioned.*
- **Contraindications:** Known allergy to medication
- Pregnancy Category B
- Side-effects:
  - In narcotic dependent patient, withdrawal symptoms may be precipitated.
- Adverse reactions: With higher than recommended doses:
  - Nausea
  - Vomiting
  - Tachycardia
  - Hypertension
  - Tremors
- TMEP use:
  - *Loss of Consciousness* (without seizures) *Protocol*

Nelfinavir (Viracept®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Anti-retroviral agent, protease inhibitor
- Indications: HIV post exposure prophylaxis
- Adult dose: 750mg tid or 1250mg bid if taken with food.

- *Pediatric dose: Children 2-13 years old: 45-55mg/kg bid, or 25-35mg/kg tid.*
  - *If tablets are unable to be taken may use powder form mixed with water, milk, formula, or dietary supplement. Do not use acidic juices. Once mixed, do not store for more than 6 hours.*
- **Contraindications:**
  - Hypersensitivity to Nelfinavir
  - Concurrent therapy with amiodarone, ergot derivatives, midazolam, pimozide, quinidine, triazolam
- Pregnancy Category B
- Adverse reactions:
  - Diarrhea (14-20% of adults, 39-47% of children)
  - Nausea
  - Flatulence
  - Rash
  - Decreased lymphocytes
  - Decreased neutrophils
  - Decreased hemoglobin
  - Increased creatine kinase
  - Increased transaminases
  - Abdominal pain
  - Weakness
  - Other reactions occur at a rate of less than 2%
- Other notes:
  - Has high potential for interactions with other drugs.
  - Not recommended for use with rifampin, St. John's Wort, lovastatin, simvastatin, or proton pump inhibitors. Serum levels will be significantly reduced.
  - Should be taken with meals to increase plasma concentration.
  - If mixed with acidic food or juice (e.g.,orange juice, apple juice, applesauce) it may have a bitter taste.
- TMEP use:
  - *HIV Post Exposure Prophylaxis Protocol*

Nifedipine (Procardia®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: An antianginal drug belonging to a class of pharmacological agents, the calcium channel blockers. It works by relaxing blood vessels so blood can flow more easily.
- Indications
  - HAPE prophylaxis/treatment.
  - Certain types of chest pain (angina). It may help to increase exercise tolerance and decrease the frequency of angina attacks. Use other medications (e.g., sublingual nitroglycerin) to relieve attacks of chest pain.
- **Contraindications:** Known allergy to medication
- Pregnancy Category C
- Dose
  - 10mg PO, then 20mg PO q 6hr.
- Side-effects: Primarily vasodilatory in nature (hypotension, peripheral edema)

- Warning:
  - Although, in most patients, the hypotensive effect of nifedipine is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension.
- TMEP use:
  - *Altitude Illness Protocol*

Ondansetron (Zofran®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: antiemetic
- Indications
  - Prevention of nausea and vomiting
- Adult dose:
  - Oral dose: 4-8mg PO tid up to 48 hrs
  - IV / IM dose : 4mg IV over 2-5 min or 4mg IM tid
- *Pediatric dose:*
  - *Oral dose:*
    - *Little information available on dosing in children <= 3 yrs*
    - *4–11 years of age: 4mg tid up to 48 hours*
    - *>12 years of age: 4-8mg PO bid up to 48 hrs*
  - *IV dose:*
    - *Little information available on dosing in children <= 2 yrs*
    - *2-12 years old and <40kg: single .1mg/kg IV dose over 2-5 min*
    - *2-12 Years and > 40kg: 4mg IV over 2-5 min*
- **Contraindications:**
  - Hypersensitivity to any component of product
- Pregnancy Category B
- Side-effects:
  - Anxiety
  - Dizziness
  - Sedation/drowsiness
  - Headache
  - Malaise/fatigue
  - Chills/shivering
  - Constipation or diarrhea
  - Fever
  - Pruritis
  - Urinary retention
  - Musculoskeletal pain
  - Extrapyramidal symptoms
  - Arrhythmias
  - Hypotension
  - Chest pain
- Adverse reactions:
  - Elevated liver transaminases
  - Rare cases of hypersensitivity, sometimes severe (anaphylaxis) have been reported
  - Syncope (rare)
  - Grand mal seizures (rare)
  - Bronchospasm (rare)
  - Transient blurred vision (rare)
  - Hypokalemia (rare)
  - Rifampin may decrease ondansetron levels
- TMEP use:
  - *Nausea and Vomiting Protocol*

Fentanyl, Oral (Actiq Lozenge®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Opioid – Oral transmucosal fentanyl citrate.
- Indications: Severe battlefield related trauma pain
- Dose: 400-800mcg.
  - The blister package should be opened with scissors immediately prior to product use. The patient should place the ACTIQ unit in his or her mouth between the cheek and lower gum, occasionally moving the drug matrix from one side to the other using the handle. The ACTIQ unit should be sucked, not chewed. A unit dose of ACTIQ, if chewed and swallowed, might result in lower peak concentrations and lower bioavailability than when consumed as directed.
  - The ACTIQ unit should be consumed over a 15-minute period. Longer or shorter consumption times may produce less efficacy than reported in ACTIQ clinical trials. If signs of excessive opioid effects appear before the unit is consumed, the drug matrix should be removed from the patient's mouth immediately and future doses should be decreased.
- **Contraindications:** Known allergy to medication
- Pregnancy Category C
- **Treatment of overdose**:
  - Ventilatory support
  - Intravenous access
  - Narcan (naloxone) or another opioid antagonist may be warranted in some instances, but it is associated with the risk of precipitating an acute withdrawal syndrome.
- Side-effects: The most serious adverse effects associated with all opioids are:
  - Respiratory depression (potentially leading to apnea or respiratory arrest)
  - Circulatory depression
  - Hypotension
  - Shock
  - All patients should be followed for symptoms of respiratory depression.
- TMEP use:
  - *Pain Management Protocol*

Osmotrol® – See Mannitol

Oxymetazline HCl (Afrin® Nasal Spray)

- Description: Vasoconstrictor (decongestant)
- Indications: Use as an adjunct to valsalva maneuver to clear ears and sinuses during compression and decompression.
- Dose: Spray into each nostril 2 times, twice daily. Not to exceed three consecutive days due to rebound congestion
  - NOTE: Do not tilt head backwards while spraying.
- **Contraindications:**
  - Severe damage to tympanic membrane/sinuses from barotrauma.
- Pregnancy Category C
- Side-effects:
  - Burning
  - Sneezing and stinging of nasal mucosa
- Adverse reactions:
  - Rhinitis
  - Rebound congestion

- TMEP use:
  - Epistaxis Protocol

Phenergan® - See Promethazine HCl

Primaquine

- Description: Antimalarial
- Indications: Used to prevent relapse of *P. vivax* and *P. ovale* malarias and to prevent attacks after departure from areas where *P. vivax* and *P. ovale* malarias are endemic.
- Dose: 30mg PO daily x 14 days beginning immediately after leaving the malarious area
  - Screen for G6PD deficiency prior to dispensing.
  - Give with food to prevent gastric irritation.
- **Contraindications:**
  - G6PD deficiency
  - Rheumatoid Arthritis
  - SLE
  - Pregnancy
- Pregnancy Category C
- Side-effects:
  - Darkening of urine
  - Fevers
  - Chills
  - Cyanosis
  - Nausea
  - Vomiting
  - Abdominal cramps
- Adverse reactions:
  - Visual disturbances
  - Hypertension
  - Anemia/leukopenia
  - Methemoglobinemia
- TMEP use:
  - *Malaria Protocol*

Procardia® - See Nifedipine

Promethazine HCl (Phenergan®)

- **WARNING** GROUNDING medication for personnel on flight status
- Description: Phenothiazine class. An H_1 receptor blocking agent. Antihistamine, sedative, antimotion-sickness, antiemetic, and anticholinergic effects. The duration of action is generally from four to six hours. The major side-effect this drug is sedation.
- Indications:
  - Antihistamine for allergies
  - Anaphylactic reactions in addition to epinephrine.
  - Nausea
  - Vomiting
  - Motion sickness.
  - Antiemetic therapy
- Adult dose:
  - Oral dose
    - Nausea / vomiting: The average adult dose is 25mg q 4 hr.
    - Motion sickness: The average adult dose is 25mg bid. The initial dose should be taken one-half to one hour before anticipated travel and be repeated 8-12 hours

later if necessary. On succeeding days of travel, it is recommended that 25mg be given on arising and again before the evening meal.
    - Parenteral: administered by deep IM injection
        - Nausea / vomiting: 12.5-25mg q 4-6 hr PRN. If taking narcotics or barbiturates, it may be necessary to reduce doses of those medications to prevent excess somnolence.
        - Motion sickness: 12.5-25mg; repeat PRN up to 4 times/day
- *Pediatric dose:*
    - *Oral dose:*
        - *Nausea / vomiting*
            - *2-12 years old: 1.1mg/kg of body weight. Do not exceed half of the suggested adult dose.*
            - *Children < 2 years old:* ***Contraindicated***
        - *Motion Sickness:* ***Contraindicated*** *in children*
    - *Parenteral: administered by deep IM injection*
        - *Nausea / vomiting :*
            - *2 to 12 years old: 12.5-25mg q 4-6hr PRN. If taking narcotics or barbiturates, reduce the dose to 1.1mg/kg.*
        - *Motion sickness:* ***Contraindicated*** *in children*
- **Contraindications:**
    -
    - Children < 2 years old
    - Comatose states
    - Antiemetics should not be used in vomiting of unknown etiology in children.
    - Asthma
- Pregnancy Category C
- Side-effects:
    - Drowsiness, sedation, sleepiness
    - Anticholinergic effects – dry mouth, urinary retention, dry eyes, constipation
    - Photosensitivity
    - Bradycardia,
    - Urticaria,
    - Sedation
    - Respiratory depression
    - Hypotension
    - Chest pain
- Adverse reactions:
    - Lowers seizure threshold
    - Extrapyramidal symptoms, dystonia
    - May exacerbate glaucoma
    - May exacerbate hypertension
    - Cholestatic jaundice
    - Arrhythmias
- 

Warning:
    - Intra-arterial injection may result in gangrene of the affected extremity.
    - Because of the potential for Phenergan to reverse epinephrine's vasopressors effect, epinephrine should **NOT** be used to treat hypotension associated with Phenergan overdose.
    - Subcutaneous injection or IV infiltration may result in tissue necrosis
- Other notes:
    - Store at room temperature, between 15°-25° C (59°-77° F).
    - Protect from light.
    - Use carton to protect contents from light.
    - Do not use if solution is discolored or contains a precipitate.
    - IV administration may be hazardous and is **NOT** recommended

- TMEP use:
  - *Nausea and/or Vomiting Protocol*

Proventil® – See Albuterol Inhaler

Pseudoephedrine (Sudafed®)

- Description: Adrenergic class. Primary activity though α-effects on respiratory mucosal membranes reducing congestion, hyperemia, edema, and minimal bronchodilation secondary to β-effects.
- Indications:
  - Nasal decongestant
  - Adjunct in otitis media with antihistamines
- Adult dose:
  - 30-60mg q 4-6 hr PO
- *Pediatric dose:*
  - *6-12 years old: 30mg/dose PO q 4-6hr*
  - *2-5 years old: 15mg/dose PO q 4-6hr*
- **Contraindications:**
  - Hypersensitivity
  - Narrow angle glaucoma
- Pregnancy Category C
- Precautions:
  - Pregnancy
  - Cardiac disorders
  - Hyperthyroidism
  - Diabetes mellitus
  - Prostatic hypertrophy
  - Lactation
  - Hypertension
- Side-effects:
  - CNS: Tremors, anxiety, insomnia, headache, dizziness, hallucinations, seizures
  - CV: Palpitations, tachycardia, hypertension, chest pain, dysrrhythmias
  - EENT: Dry nose, irritation of nose and throat
  - GI: Nausea, vomiting, anorexia, dry mouth
  - GU: dysuria
- Other notes:
  - Do not use continuously, or more than recommended dose.
  - Rebound congestion may occur.
  - Avoid taking at bedtime, stimulation may occur.
- TMEP use:
  - Allergic Rhinitis/Hay Fever/ Cold Like Symptoms
  - *Barotrauma Protocol*

Quinolones – General Antimicrobial Spectrum

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- 1ST generation: Gram negative (excluding Pseudomonas), urinary tract only.
  - *Example nalidixic acid*
- 2nd generation: Gram negative (including Pseudomonas); *Staph aureus* but not *Pneumococcus*; some atypicals.
  - *Examples: ciprofloxacin, norfloxacin, ofloxacin*

- 3rd generation: Gram negative (including Pseudomonas); gram positive (including *Staph aureus* and *Pneumococcus*); expanded atypical coverage.
  - *Example: levofloxacin*
- 4th generation: Same as 3rd generation: plus broad anaerobic coverage.
  - *Examples: gatifloxacin, moxifloxacin, trovafloxacin*
- **Contraindications:** Known allergy to medication
- Pregnancy Category C

Rabeprazole (Aciphex®)

- Description: GI agent – proton pump inhibitor (PPI)
- Gastric PPI that specifically suppresses gastric acid secretion by inhibiting the acid secretion in the cells of the stomach. Does not have H2 histamine receptor blocking properties.
- Indications: For healing and maintenance of erosive or ulcerative gastroesophageal reflux disease (GERD), duodenal ulcers and hypersecretory conditions.
- **Contraindications:**
  - PPI hypersensitivity
  - Pregnancy
- Pregnancy Category B
- Adult dose:
  - 20mg PO qd
- *Pediatric dose:*
  - ***Contraindicated.***
- Side-effects:
  - Headaches
  - Nausea
  - Vomiting
  - Diarrhea
  - Abdominal cramps
  - ↑ temperature
- Adverse reactions:
  - Stevens-Johnson Syndrome
  - Toxic epidermal necrolysis (Fatalities have been reported.)
- Other notes:
  - This medication should be swallowed whole. It should not be crushed or chewed.
- TMEP use:
  - *Abdominal Pain Protocol*

Ranitidine (Zantac®)

- 
  WARNING Aviation personnel are grounded for 72 hours when taking an H2 blocker for the first time. There is no grounding period if aviation personnel have taken before without any no side-effects.
- Description: H2 blocker; ↓ secretion of stomach acid
- 

  NOTE: Drug Interactions: ↓absorption of oral diazepam.
- Indications:
  - Gastric and/or peptic ulcers
  - Upper GI bleeds
  - Prevention of stress ulcers in burn victims or patients on steroid treatment.
  - Drug of choice for treatment of gastric or peptic ulcers.
  - Adjunct in treatment of urticaria and anaphylaxis.
- Adult dose:

    - 50mg IV / IM q 6-8hr for ulcers, burns, steroid use, upper GI bleeds, urticaria, or anaphylaxis.
    - Oral dose: 150mg bid for ulcer, urticaria.
- *Pediatric dose: 1.5mg/kg IV x 1, then 0.75mg/kg IV q 12hr*
- **Contraindications:**
    - Known/suspected liver disease
- Pregnancy Category B
- Side-effects:
    - Headache
    - Diarrhea
    - Constipation
    - Muscle aches
    - Vertigo
    - Malaise
    - Dry mouth
    - Nausea
    - Vomiting
- Adverse reactions:
    - Thrombocytopenia
    - Liver toxicity
- TMEP use:
    - *Abdominal Pain Protocol*
    - *Anaphylactic Reaction Protocol*
    - *Chest Pain Protocol* (Other Etiologies)

Retrovir® - See AZT (Zidovudine)

Rifadin® – See Rifampin

Rifampin (Rifadin®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: Inhibits DNA-dependent RNA polymerase
- Class: Bacteriacidal antibiotic
    - Indications:
    - Tuberculosis
    - Anthrax
    - Brucellosis
    - Asymptomatic carriers of *Neisseria meningitidis* to eliminate meningococci from the nasopharynx
    - MRSA soft tissue infections
- Dose:
    - 600mg PO bid
- **Contraindications:**
    - Liver dysfunction
- Pregnancy Category C
- Side-effects/precautions:
    - Hepatotoxic
        - Hepatitis
        - Jaundice
        - Liver failure in severe cases

- Respiratory
  - Shortness of breath
  - Wheezing
- Cutaneous
  - Flushing
  - Pruritus
  - Rash
  - Redness and watering of eyes
- Abdominal
  - Nausea
  - Vomiting
  - Abdominal cramps
  - Diarrhea
  - Jaundice
  - Flatulence

- Warnings:
  - 

Concomitant antacid administration may reduce the absorption of rifampin. Daily doses of rifampin should be given at least 1 hour before the ingestion of antacids.
  - 

Rifampin and its metabolites may impart a red-orange color to urine, feces, sputum, sweat and tears; soft contact lenses worn during rifampin therapy may become permanently stained
- TMEP use:
  - *Cellulitis/ Cutaneous Abscess Protocol*

Ritonavir and Lopinavir – See Kaletra®

Rocephin® (Ceftriaxone Sodium)

Salmeterol (Serevent®)

- Description: Long acting inhaled beta-2 adrenergic agonist; relaxes bronchial smooth muscle (bronchodilator)
- Indications:
  - Relief of asthma
  - Prevention/treatment of exercise-induced bronchospasm
  - Treatment for chronic obstructive pulmonary disease (COPD)
  - Nocturnal asthma
  - HAPE prophylaxis/treatment
- Adult dose:
  - 1 inhalation q 12hr (twice daily)
- *Pediatric dose:*
  - *If more than 4 years of age, same as adult dose*
- **Contraindications:**
  - Hypersensitivity to salmeterol or other beta-2 agonists
- Pregnancy Category C
- Side-effects:
  - Dry mouth/throat (sugarless hard candy or ice chips will often relieve symptoms)
- Adverse reactions:
  - Cardiovascular: tachyarrythmias
  - Neurologic: dizziness, headache, tremor
  - Respiratory: throat irritation, also exacerbation of asthma (severe)

- Caution:
  - This medication **DOES NOT** give immediate relief in the event of asthma attack or bronchospasm
  - This medication **SHOULD NOT** be used in combination with other long-acting inhaled beta-agonists (e.g., formoterol, salmeterol/fluticasone)
  - Milk allergy; milk protein in the inhalation powder formulation
- TMEP use:
  - *Altitude Illness Protocol*

Septra® – See Trimethoprim-Sulfamethoxazole

Serevent® – See Salmeterol

Sildenafil (Viagra®)

- Class: PDE5 inhibitor.
- Action: Vasodilator with potential blood pressure lowering effects
- Dose: 50mg
- Contraindications:
  - Nitrates – Concomitant use of nitrates in any form. Tadalafil potentiates the hypotensive effects of nitrates
- Pregnancy Category B
- Side Effects:
  - Cardiovascular- angina pectoris, chest pain, hypotension, myocardial infarction, postural hypotension, tachycardia
  - Digestive - dry mouth, dysphagia, esophagitis, gastritis,
  - Ophthalmologic- blurred vision, conjunctivitis (including conjunctival hyperemia), eye pain
- Warnings;
  - Alpha Blockers: coadministration may potentiate the blood pressure lowering effects of alpha blockers.
  - Antihypertensive: coadministration may potentiate the blood pressure lowering effects of alpha blockers.
  - Antacids: simultaneous administration of antacids reduces the absorption of Cialis
  - Ritonavir and HIV Protease Inhibitors: Increased tadalafil absorption.

Sodium Bicarbonate

- **WARNING** GROUNDING medication for personnel on flight status.
- Description: Alkalinizing agent, electrolyte
- Action:
  - Sodium bicarbonate combines with hydrogen ions to form water and carbon dioxide
  - Buffers metabolic acidosis
  - Forces an intracellular shift of excess potassium in hyperkalemia
  - Increased pH
- Indications:
  - Severe metabolic acidosis in cardiac arrest refractory to ventilation
  - Tricyclic antidepressant overdose
  - Hyperkalemia
  - Alkalinization agent for specific toxins (Salicylates, Phenobarbital)
- Dose:
  - 1mEq/kg IV
- **Contraindications:**
  - Metabolic or respiratory alkalosis
  - Hypocalcemia

- Hypokalemia
- Hypernatremia

- Pregnancy Category C
- Side-effects/precautions:
  - Metabolic alkalosis may occur
  - 

Precipitates when mixed with calcium chloride or gluconate
  - May increase intracellular acidosis
  - May cause imbalance
  - May deactivate catecholamine
  - Large solute load may lead to fluid overload
- TMEP use:
  - *Crush Injury Protocol*

Sudafed® - See Pseudoephedrine)

Tenofovir (Viread®)

- **WARNING** GROUNDING medication for personnel on flight status.
- Indications: Treatment of HIV
- Dose:
  - 1 pill daily
- **Contraindications:** Known allergy to medication
- Pregnancy Category B
- Side-effects:
  - Immune system disorders
    - Allergic reaction
  - Metabolism and nutrition disorders
    - Lactic acidosis
    - Hypokalemia
    - Hypophosphatemia
  - Respiratory, thoracic , and mediastinal disorders
    - Dyspnea
  - Gastrointestinal disorders
    - Pancreatitis
    - Increased amylase
    - Abdominal pain
  - Hepatobiliary disorders
    - Hepatic steatosis
    - Hepatitis
    - Increased liver enzymes (most commonly AST, ALT gamma GT)
  - Skin and subcutaneous tissue disorders
    - Rash
  - Musculoskeletal and connective tissue disorders
    - Rhabdomyolysis,
    - Osteomalacia (manifested as bone pain and which may contribute to fractures)
    - Muscular weakness
    - Myopathy
  - Renal and urinary disorders
    - Acute renal failure
    - Nephrogenic diabetes insipidus
    - Renal insufficiency
    - Proteinuria

- General disorders
  - Weakness
  - Fatigue
- TMEP use:
  - *HIV Post Exposure Prophylaxis Protocol*

Tenofovir and Emtricitabine – See Truvada®

Tenofovir and Emtricitabine and Efavirenz – See Atripla®

Tequin® – Gatifloxacin **(No longer used)**

Tetracaine 0.5% Drops

- **WARNING** Aviation personnel are grounded for 12 hours after the use of local anesthesia and until symptoms have resolved enough to allow safe performance of duties.
- Description: Local anesthetic
- Indications: As a topical optic anesthetic (may aid in ocular exam to relieve blepharospasm); removal of foreign bodies
- Dose:
  - 1 or 2 drops – 2-3 minutes before procedure
  - See appropriate TMEP
- **Contraindications:**
  - Not for prolonged use
- Pregnancy Category C
- Side-effects:
  - Stinging
  - Tearing
  - Swelling
  - Sensitivity to light
- Adverse reactions:
  - Conjunctival redness
  - Transient eye pain
  - Hypersensitivity reactions
- TMEP use:
  - *Corneal Abrasion, Corneal Ulcer, Conjunctivitis Protocol*

Tadalafil (Cialis®)

- Class: PDE5 inhibitor.
- Action: Vasodilator with potential blood pressure lowering effects
- Dose: 10mg
- Contraindications:
  - Nitrates – Concomitant use of nitrates in any form. Tadalifil potentiates the hypotensive effects of nitrates
- Pregnancy Category B
- Side Effects:
  - Cardiovascular - angina pectoris, chest pain, hypotension, myocardial infarction, postural hypotension, tachycardia
  - Digestive - dry mouth, dysphagia, esophagitis, gastritis,
  - Ophthalmologic- blurred vision, conjunctivitis (including conjunctival hyperemia), eye pain

- Warnings:
  - Alpha Blockers: coadministration may potentiate the blood pressure lowering effects of alpha blockers.
  - Antihypertensive: coadministration may potentiate the blood pressure lowering effects of alpha blockers.
  - Antacids: simultaneous administration of antacids reduces the absorption of Cialis
  - Ritonavir and HIV Protease Inhibitors: Increased tadalafil absorption.
  - Rifampin: reduced tadalafil absorption 46%. The reduced exposure of tadalafil with the coadministration of rifampin can be anticipated to decrease the efficacy of tadalafil for once daily use; the magnitude of decreased efficacy is unknown.
- TMEP Use:
  - *Altitude Illness Protocol*

Toradol® – See Ketorolac

Trimethoprim-Sulfamethoxazole (TMP-SMZ, Bactrim®, Septra®)

- **WARNING** Aviation personnel are grounded for the initial 24 hours of antibiotic therapy and until the medical condition no longer interferes with safely performing aviation duties and the patient is free of side-effects.
- Description: Antimicrobial – antibacterial, sulfonamide
- Action:
  - Fixed combination of TMP and SMZ, synthetic folate antagonists and enzyme inhibitors that prevent bacterial synthesis of essential nucleic acids and proteins; effective against *Pneumocystis carinii* pneumonitis, Shigellosis enteritis, most strains of enterobacteriaceae, *Nocardia, Legionella micdadei, and Legionella pneumophila, and Haemophilus ducreyi*
- Indications:
  - Cellulitis
  - Enteritis
  - Urinary tract infections
- Adult dose: 160mg TMP/800mg SMZ (DS) PO bid
- **Contraindications:**
  - TMP, SMZ, sulfonamide, or bisulfite hypersensitivity
  - Group A beta-hemolytic streptococcal Pharyngitis
  - Use caution with severe allergy or bronchial asthma
  - G6PD deficiency
  - Pregnancy
- Pregnancy Category C
- Adverse effects:
  - Rash
  - Toxic epidermal necrolysis
  - Nausea and vomiting
  - Diarrhea
  - Pseudomembranous enterocolitis
  - Abdominal pain
- TMEP use:
  - *Cellulitis/Cutaneous Abscess Protocol*
  - *Urinary Tract Infection Protocol*

Truvada® (Emtricitabine and Tenofovir)

- **WARNING** GROUNDING medication for personnel on flight status.
- Indications: Treatment of HIV
- Dose:
  - Adult Dose: 1 tablet daily
- **Contraindications:** Known allergy to medication
- Pregnancy Category B
- Side-effects:
  - General
    - Fatigue
  - Infections
    - Sinusitis
    - Upper respiratory infections
    - Nasopharynigitis
  - CNS
    - Headache
    - Dizziness
  - Psychiatric
    - Depression
    - Insomnia
  - Immune system disorders
    - Allergic reaction
  - Metabolism and nutrition disorders
    - Lactic acidosis
    - Hypokalemia
    - Hypophosphatemia
  - Respiratory, thoracic, and mediastinal disorders
    - Dyspnea
  - Gastrointestinal disorders
    - Pancreatitis
    - Increased amylase
    - Abdominal pain
    - Nausea
    - Vomiting
    - Diarrhea
  - Hepatobiliary disorders
    - Hepatic steatosis
    - Hepatitis
    - Increased liver enzymes (most commonly AST, ALT gamma GT)
    - Jaundice
  - Skin and subcutaneous tissue disorders
    - Rash
  - Musculoskeletal and connective tissue disorders
    - Rhabdomyolysis
    - Osteomalacia (manifested as bone pain and which may contribute to fractures), muscular weakness, myopathy
  - Renal and urinary disorders
    - Acute renal failure
    - Nephrogenic diabetes insipidus
    - Renal insufficiency
    - Proteinuria
    - Polyuria
  - General disorders and administration site conditions
    - Fatigue

- Other notes:
  - Store at 25° C (77° F), excursions permitted to 15–30° C (59–86° F).
- TMEP use:
  - *HIV Post Exposure Prophylaxis Protocol*

Tylenol® – See Acetaminophen

Valium® - See Diazepam

Ventolin® – See Albuterol Inhaler

Versed® – See Midazolam

Viagra® - see Sildenafil

Viread® - See Tenofovir

Viracept® – See Nelfinavir

Xylocaine® – See Lidocaine HCL

Z- Pak® – See Azithromycin

Zantac® – See Ranitidine

Zidovudine - See AZT

Zithromax® – See Azithromycin

Zofran® – See Ondansetron

Zidovudine (AZT, ZDV) and Lamivudine - See Combivir®

Zymar® – See Gatifloxacin 0.3% Ophthalmic Liquid

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SENIOR TACTICAL MEDIC DUTIES AND RESPONSIBILITIES

The senior tactical Medic duty description will be used to define the responsibilities of the highest ranking and most experienced Medic present at any given location and time. This Medic is designated as the "Senior Medic" at that specific location and thus is responsible for the duties and responsibilities as listed below.

- **Principal medical advisor to the unit commander and senior enlisted advisor**
- **Provide and supervise advanced trauma management within protocols and sick call within scope-of-practice**
- **Lead, supervise, and train junior Medics**
  - Individual training
  - Health and welfare
  - Development and counseling
  - Troop leading procedures and pre-combat inspections (PCIs)
- **Plan, supervise, and conduct casualty response training for Unit Members and Leaders**
  - First Responder training
  - Casualty response training for tactical leaders (CRTRL)
  - Opportunity training / spot-checking
- **Maintain company level medical equipment and supplies**
  - Accountability / inventory
  - Maintenance / serviceability
  - PCI of individual first aid kits
  - PCI of squad/team casualty response kits
  - Requisition and receive medical supplies from appropriate source
- **Plan, coordinate, and execute medical planning for unit level operations**
  - On-target casualty response plan
  - Casualty evacuation from target to next higher medical capability
  - Task organization of company Medics
- **Conduct after action reviews and report and archive medical lessons learned**
- **Monitor the status of health in the unit / element**
  - Physically limiting profiles (known health histories of unit members)
  - Immunization status of unit members

MEDICAL & CASUALTY RESPONSE PLANNING

Initial Planning / WARNORD

MEDICAL THREAT ASSESSMENT

The unit medical planner must assess all the possible health and medical threats are present to the unit. This assessment includes all aspects of environmental health hazards as well as specific threats from enemy weapons

systems. Through the medical threat assessment, the medical planner will assess all possible preventive measures the unit can employ to minimize these threats. Medical planners must be prepared to make recommendations to unit commanders, leaders, and members on how to take appropriate precautions or measures prevent injuries and illnesses. The overall goal is to have healthy operators ready to perform a mission; keep them healthy during the mission; and to bring healthy operators back home.

- ☐ Identify Area of Operations (country, region, environment)
  - ✦ Host Country (Staging Base) – This is the friendly region you may be operating from as a base of operations. The threats may be the same as where the mission targets are located or can be completely different.
  - ✦ Target country – This is the area or region in which the unit will be conducting tactical missions.
- ☐ Determine known health threats & risks – one must identify through all possible sources what the known health threats and risks are. The planner can utilize many aspects of the internet, publications, country studies, or products from World Health Organization or national intelligence organizations to gain access to required information.
  - ✦ Diseases / illnesses of significance that could be a risk to unit members before, during or after the mission.
  - ✦ Environmental threats (plants, animals, climate, terrain) can be a daunting task, but must be assessed to prevent injuries and illnesses that can cause mission mishaps.
- ☐ Current Unit Medical Readiness status – the planner must have knowledge of the unit's current immunization status.
- ☐ Preventive Medicine guidelines (what is required before, during, and after) – Many organizations publish guidelines for preventive medicine measures for different regions around the world. Typically, regional command operations orders (OPORD) will contain specific guidelines on preventive medicine.
- ☐ Enemy weapons, munitions, and tactics, to include chemical and biological weapons – The medical planner must assess the types of enemy weapons and the types of injuries they can inflict on the unit. The planner must make recommendations to prevent these injuries such as the use of body armor or protective masks.
- ☐ Key questions the planner must ask to assess the unit's preparedness.
  - How ready is the unit if it encounters diseases / illnesses?
  - What preparation is needed by the unit?
  - Do unit members need special preventive medicine items issued?

HIGHER MEDICAL GUIDELINES & REQUIREMENTS

- ☐ Chemoprophylaxis – the planner must determine if unit members are required to take medications for the duration of the mission to prevent illnesses.
  - ✦ Anti-Malarial Drugs
  - ✦ Other preventive measures
- ☐ Do we need to change anything in the way we normally do business?

REQUESTS FOR INFORMATION (RFI)

- ☐ Request updates to dated information from available sources about disease or environmental threats. These sources may be within the chain of command or may be international health organization.
- ☐ Maps / Imagery
- ☐ Host Nation (ISB) Medical Capabilities – The planner must be prepared to assess the medical facilities and infrastructure of the region where missions will be staged and executed.
  - ✦ Hospitals / medical facilities
  - ✦ Nationwide medical training / competency

DETERMINE MEDICAL ASSETS

- ☐ The medical planner must have a clear understanding of the medical assets available to support the mission.
- ☐ Organic (part of the unit), Attached, Air, Ground, Theater, JTF, Host Nation, ISB, FSB, etc…
- ☐ CASEVAC / MEDEVAC Support
  - ✦ How many and what type?
  - ✦ Capabilities and Limitations?
  - ✦ Hoist and high angle extraction?
  - ✦ Medical Personnel and Equipment on board? Level of Training?
- ☐ Determine nearest surgical capability
  - ✦ Where are your casualties being evacuated to?
  - ✦ What are the capabilities / limitations?
  - ✦ What is their MASCAL or overload for their system?
- ☐ Determine Staging Base area medical support
  - ✦ Can they provide labs, x-rays, medications, preventive medicine, etc?

FAMILIARIZATION WITH MEDICAL ASSETS

- ☐ Published References (Look it up in the appropriate reference manual to gain understanding of capabilities and organization)
  - ✦ What is a Combat Support Hospital?
  - ✦ What is a Forward Surgical Team?
  - ✦ What is an Area Support Medical Company?
- ☐ Can you see their layout / equipment?
- ☐ Can you conduct familiarization training as required?
- ☐ What are their capabilities and limitations?
- ☐ Can you talk to them and what can <u>they</u> know about you and your mission?

Tactical Operation Development

CASUALTY ESTIMATION

- ☐ Look at the target and the template of enemy positions
- ☐ Look at the commander's assault plan
- ☐ The medical planner must determine where casualties are likely to occur and ensure there is a management and evacuation plan in place for all phases of the operation.
- ☐ **Plan to take casualties during every phase of the operation (infiltration, assault, clear/secure, consolidate, defend, exfiltration).**

- ✦ Where do you foresee taking casualties?
- ✦ Where is it most critical for the Medics to be located?
- ✦ Do you need to task organize your medical team?
- ✦ Where does the unit need to establish casualty collection points (CCP)?
- ✦ What evacuation methods need to be considered?
- ✦ Where is the closest helicopter landing zone (HLZ) or ambulance exchange point (AXP)?
- ✦ Where do you emplace and preposition medical assets/augmentation?

☐ Review Preventive Medicine issues and anticipate Disease Non-Battle Injuries (DNBI)
- ✦ What are the health threats?
- ✦ What actions will prevent or decrease disease and non-battle injuries?

DETERMINE KEY LOCATIONS

☐ Based on your casualty estimation and the tactical assault plan…
- ✦ Where should the CCP be located?
- ✦ Where should patient exchanges be located? (CCP, HLZ, AXP)
- ✦ Where are the projected blocking positions, fighting positions, etc…?
- ✦ Where is the Command & Control going to be located?
- ✦ Who is in charge of each key location?
- ✦ Establish both Primary and Alternate Locations for all medical points of the plan?
- ✦ What are the ground movement routes? Evacuation channels must flow with the flow of the unit's tactical plan.

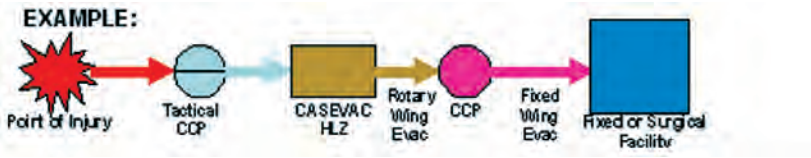
DETERMINE CASUALTY FLOW

☐ The medical planner must always plan evacuation from Point-of-Injury to a Fixed Facility and all of the steps in between.

☐ Where are your casualties being evacuated to?
- ✦ Are you evacuating by ground or air to a casualty collection point?
- ✦ Are you evacuating by ground or air to an casualty transload point?
- ✦ What are the distances and time of travel?
- ✦ Can your patients make it that far? What needs to be corrected?
- ✦ Who is evacuating your casualties?
- ✦ Do you need to modify the placement of medical assets to ensure a continuity of care?

AIR TACEVAC PLAN

☐ What is the type of Air TACEVAC mission?
- ✦ Dedicated – an air asset whose purpose after infiltration is casualty evacuation. It is outfitted and manned for casualty management
- ✦ Designated – an air asset that will be the aircraft instructed to evacuate casualties. May be equipped for casualties if requested.



- ✦ On-Call – air assets that are held in reserve or must be launched to respond to casualty evacuation. May also apply to MEDEVAC covering the area.

☐ Aircraft type?
☐ Maximum casualty load?
☐ How are casualties to be loaded?
- ✦ Packaging requirements: Litters, Skedcos, etc..?
- ✦ Is the aircraft equipped with litter stanchions?
- ✦ Loading procedures? Approach procedures?

☐ What medical capability is on the aircraft?
- ✦ Flight medic, paramedic, nurse, physician?
- ✦ Are there any special casualty management equipment required?
- ✦ Medical resupply bundles?

☐ Request Procedures?
- ✦ Procedures for requesting CASEVAC? What are the channels for requesting evacuation assets?
- ✦ 9-Line MEDEVAC request versus modified format?
- ✦ Communication requirements? How do you talk with evacuation assets?

☐ Launch Authority?
- ✦ Who is the launch authority for the aircraft?
- ✦ What are the impacts on unit's TACEVAC operations?

☐ Landing requirements?
- ✦ Special HLZ considerations?
- ✦ Special markings required?
- ✦ Special equipment required?

GROUND CASEVAC PLAN---TWO PHASES:

1. **Actions required on the target.**
2. **Actions required for evacuation away from the target.**

☐ How should unit members move casualties on the target to the CCP?
- ✦ Aid & Litter Teams
- ✦ Skedco, Litter, etc…
- ✦ Ground Mobility Vehicles(Quad, HMMWV, Truck)

☐ What is the type of Ground CASEVAC mission?
- ✦ Dedicated – a ground asset whose purpose after infiltration is casualty evacuation. It is outfitted and manned for casualty management
- ✦ Designated – a ground asset that will be the vehicles instructed to evacuate casualties. May be equipped for casualties if requested.
- ✦ On-Call – ground assets that are held in reserve or must be launched to respond to casualty evacuation. This may be vehicles of opportunity (tactical or captured).

☐ Vehicle type and maximum casualty load?
☐ How are casualties to be loaded?
- ✦ Packaging requirements: Litters, Skedcos, etc..?
- ✦ Is the vehicle equipped with a carrying configuration?
- ✦ Loading procedures?

☐ What medical capability is on the vehicle?

- ✦ Medics? Advanced providers?
- ✦ Casualty management equipment?

☐ Request Procedures?
- ✦ Procedures for requesting ground CASEVAC?
- ✦ 9-Line MEDEVAC request versus modified format?
- ✦ Communication requirements?

☐ Launch Authority?
- ✦ Who is the launch authority for the vehicles?

☐ Link-up Requirements
- ✦ At your CCP or an AXP?
- ✦ Marking / signaling procedures?

COMMUNICATIONS REQUIREMENTS

☐ Do all Medics have radios?
☐ Can a Medic contact a higher care provider for guidance?
☐ Types of radios / communications security requirements?
☐ Medical Command & Control Delineation
☐ Callsigns / Frequencies / SOI
☐ Evacuation request frequencies?
☐ Evacuation asset frequencies?
☐ Casualty reporting/accountability?
☐ Re-Supply requests

MEDICAL RE-SUPPLY REQUIREMENTS & METHODS

☐ How do you request re-supply?
☐ What are the re-supply methods?
- ✦ Drop Bundles?
- ✦ Drag-off bundles?

☐ Medical packing lists? Do you need to reconfigure/repack (aidbag, cases)?
☐ How do you request specific line items?

Coordination & Synchronization

PLANNING INTERACTION (WHO TO TALK & COORDINATE WITH)

☐ Commander & Operations Officer (Tactical Plan)
☐ Executive Officer (Support & Resources)
☐ First Sergeant (CCP Operations, Manifests, Aid & Litter Teams)
☐ Battalion Medical Planner (Medical Aspects)
☐ Platoon Sergeants (Squad Casualty Response & CCPs)
☐ Junior Medics (Understanding of the Plan)
☐ Battalion Staff Planners
- ✦ S1 Personnel (Casualty Tracking and Accountability)
- ✦ S2 Intel (Health Threat/Intelligence Information)
- ✦ S3 Air (Air TACEVAC Operations)
- ✦ S4 Logistics (Ground TACEVAC & Re-Supply)
- ✦ S6 Commo (Radios, Freqs, Callsigns)

Briefs, Rehearsals, and Inspections

MEDICAL & CASUALTY RESPONSE OPORD BRIEFING AGENDA

- ☐ Health Threat
- ☐ Casualty Response Concept of the Operation
- ☐ Casualty Flow
- ☐ Key Locations (CCPs, HLZs, AXPs, etc)
- ☐ Requesting Procedures (tacEVAC, MEDEVAC, Assistance, Re-Supply)
- ☐ Medic callsigns / frequencies
- ☐ Casualty Accountability

BACK-BRIEF WITH JUNIOR MEDICS

- ☐ Ensure junior Medics understand tactical plan AND casualty response plan
- ☐ Understand packaging requirements
- ☐ Understand casualty marking procedures
- ☐ Understand communications methods

REHEARSALS

- ☐ First Responder Drills
- ☐ Squad Casualty Response Drills (care under fire, TACEVAC request/loading)
- ☐ Aid & Litter Team Drills
- ☐ CCP Operations (Assembly, security & movement, casualty movement, CCP markings, vehicle parking, link-up procedures, casualty tracking & recording, triage, treatment and management of casualties)
- ☐ Evacuation Request and Loading Procedures
- ☐ COMMEX – communications exercise/radio test
- ☐ Casualty Tracking / Accountability

PRE-COMBAT INSPECTIONS

- ☐ Individual Unit Members
  - ✦ First Aid Kits
  - ✦ Preventive Medicine (Iodine Tabs, Doxycycline, Diamox, etc…)
- ☐ Squad Casualty Response Kit
  - ✦ Team First Responder Bags
  - ✦ Evacuation Equipment (Skedco, Litters, etc…)
  - ✦ Vehicle mounted aidbags
- ☐ Medic Aidbags (Pack and/or reconfigure as required)
  - ✦ Select appropriate aidbag system per mission requirements
  - ✦ Ensure packing list in accordance with recommended stockage
- ☐ Re-Supply Packages (Pack and/or reconfigure per mission requirements)
  - ✦ Reconfigure per mission specifics (ground, air, etc…)
  - ✦ Utilize bundles, or pull-off configured as required
  - ✦ Pre-position as required with aircraft and vehicles or at staging base with logistics teams
- ☐ Medic Individual Equipment (weapon, Night-vision, radio, packing list, mission specific)
- ☐ Evacuation Assets (Quads, Vehicles, etc…)

After Action Review in Training or Combat

- ☐ Was the mission executed as planned?
- ☐ What went right?
- ☐ What went wrong?
- ☐ What could have been done better?
- ☐ What could be fixed by planning / preparation?
- ☐ What could be fixed by training?
- ☐ What could be fixed by equipment modification?
- ☐ Identify and record Sustains & Improves by Phase of the Operation.

CASUALTY COLLECTION POINT (CCP) OPERATIONS

Duties and Responsibilities

UNIT MEDICS

- **Planning Phase**
  - Provide recommendations and advise to leadership on medical support
  - Medical Support Planning by phase of the operation
  - Casualty Response & Evacuation Plan by phase of the operation
  - Recommend to the Unit Leadership & Coordinate as required:
    - CCP Locations by phase
    - Medical Task Organization & Distribution
    - Ground (on the target) Evacuation Plan & Assets
    - Air/Ground (off the target) Evacuation Plan & Assets
    - CCP, HLZ, and Evacuation Asset Security
  - Pre-Combat Inspections of junior Medics, squad casualty response kits, and individual first aid tasks
- **Execution Phase**
  - Triage, Treatment, Monitoring, and Packaging
  - Delegation of Treatment
  - Request Assistance from other medical or unit assets
  - Provide guidance and recommendations to leadership on casualty management & evacuation

UNIT MEDICAL PERSONNEL & MEDICAL PLANNERS

- **Planning Phase**
  - Provide recommendations and advise to leadership on medical support
  - Recommend to the Unit Leadership & Coordinate as required:
    - CCP Locations of subordinate units by phase
    - Medical Task Organization & Distribution
    - Ground (on the target) Evacuation Plan & Assets for all targets
    - Air/Ground (off the target) Evacuation Plan & Assets for all targets
    - CCP, HLZ, and Evacuation Asset Security for all targets
  - Augmentation requirements of subordinate units
  - Link-in with tactical operations

- **Execution Phase**
  - Triage, Treatment, Monitoring, and Packaging
  - Delegation of Treatment
  - Request Assistance from other medical or platoon assets
  - Provide guidance and recommendations to leadership on casualty management

UNIT LEADERSHIP

- **Planning Phase**
  - Evacuation Plan by phase of the operation
  - CCP locations, HLZ/AXP locations,
  - Security of CCP, Security of HLZ/AXP
  - Allocate Aid & Litter teams and carry evacuation equipment
  - Accountability / Reporting Plan
  - Distribution/Task Organization of Medical Personnel
  - Pre-Combat Inspections of Junior Medics, Squad Casualty Response Kits, and Individual First Aid Tasks
  - Conduct Casualty Response Rehearsals
- **Execution Phase**
  - Establish and Secure Casualty Collection Point (CCP)
  - Provide assistance to Medics with augmentation and directing aid & litter teams
  - Gather and Distribute casualty equipment and sensitive items
  - Accountability and Reporting to Higher
  - Request Evacuation and Establish TACEVAC link-up point
  - Manage KIA remains

Casualty Response Rehearsals

- Critical in pre-mission planning and overall unit rehearsals
- Each element should rehearse alerting aid & litter team and movement of a casualty
  - Alert and movement
  - Evacuation equipment prep
  - Clearing / securing weapons
- CCP members rehearse the following:
  - Clear and Secure CCP Location
  - Choke Point / Triage
  - Marking & Tagging
  - Accountability & Reporting
  - Equipment removal tagging/consolidation

CCP Site Selection

- Reasonably close to the fight
- Near templated areas of expected high casualties
- Cover and Concealment from the enemy
- In building or on hardstand (an exclusive CCP building limits confusion)

- Access to evacuation routes (foot, vehicle, aircraft)
- Proximity to Lines of Drift on the objective
- Adjacent to Tactical Choke Points (breeches, HLZ's, etc…)
- Avoid natural or enemy choke points
- Area allowing passive security (inside the perimeter)
- Good Drainage
- Trafficable to evacuation assets
- Expandable if casualty load increases

CCP Operational Guidelines

- 1SG / PSG is responsible for casualty flow and everything outside the CCP
  - Provides for CCP structure and organization (color coded with chemlights)
  - Maintains command & control and battlefield situational awareness
  - Controls aid & litter teams, and provides security
  - Strips, bags, tags, organizes, and maintains casualty equipment outside of treatment area as possible
  - Accountable for tracking casualties and equipment into and out of CCP and provides reports to higher
  - Casualties move through CCP entrance / exit choke point which should be marked with an IR Chemlight
- Medical personnel are responsible for everything inside the CCP
  - Triage officer sorts and organizes casualties at choke point into appropriate treatment categories
  - Medical officers and Medics organize medical equipment and supplies and render treatment to casualties
  - EMTs, RFRs, A&L Teams assist with treatment and packaging of casualties
- Minimal casualties should remain with original element or assist with CCP security if possible
- KIAs should remain with original element

CCP Building Guidelines

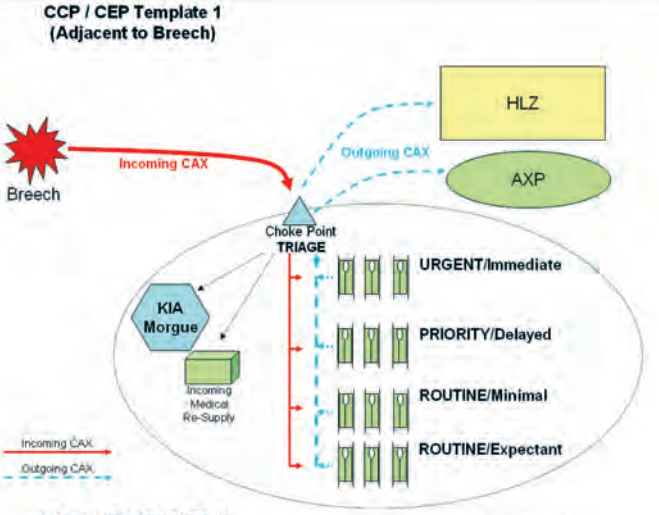
- Ensure building is cleared and secured
- Enter and assess the building prior to receiving casualties
  - Use largest rooms
  - Consider litter / skedco movement (can you do it in the area?)
  - Separate rooms for treatment categories?
  - Determine location of choke point / triage
  - Minimize congestion
- Remove / re-locate furniture or obstructions
- Color-code rooms to treatment categories (mark doors, etc…)

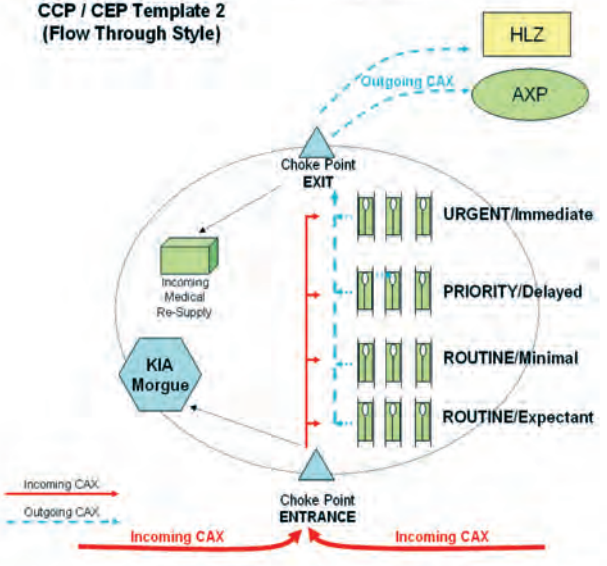
Evacuation Guidelines

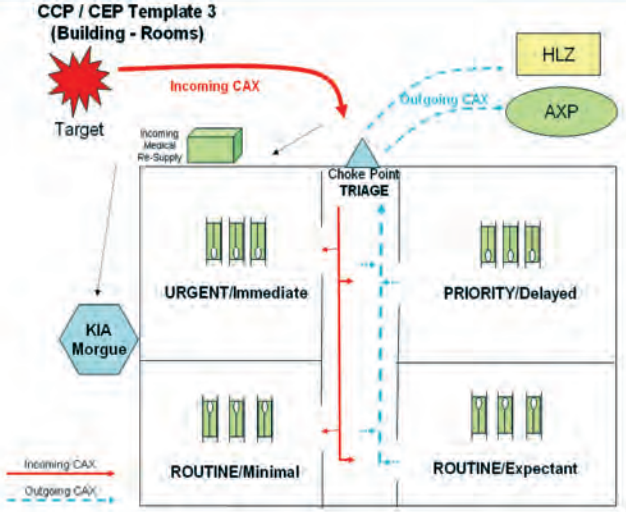
- Know the Evacuation Asset
  - Medical provider on board?
  - Monitoring equipment on board?
  - How many CAX can evacuate on asset?
- Packaging requirements for asset
  - Type litters?
  - Are there stirrups? Floor-Loading?
- Determine flow of casualties to the asset
  - Large Asset (Multiple CAX)
    - Routine on first
    - Priority on next
    - Critical (Urgent) on last, so they are first off at destination
  - Small Asset
    - Critical (Urgent) and Priority evacuated first

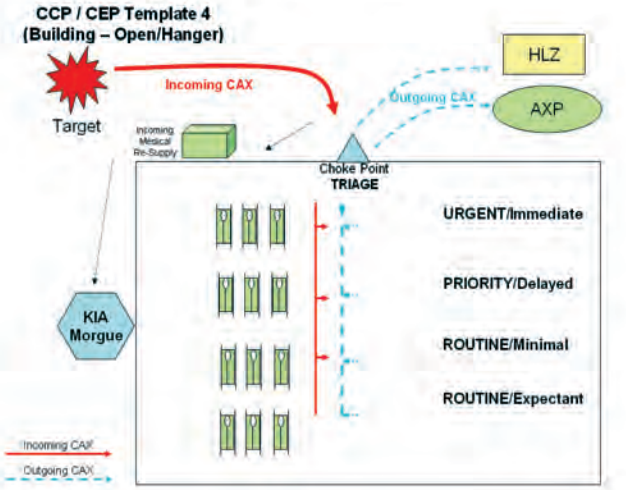
CCP Layout Templates (next page)

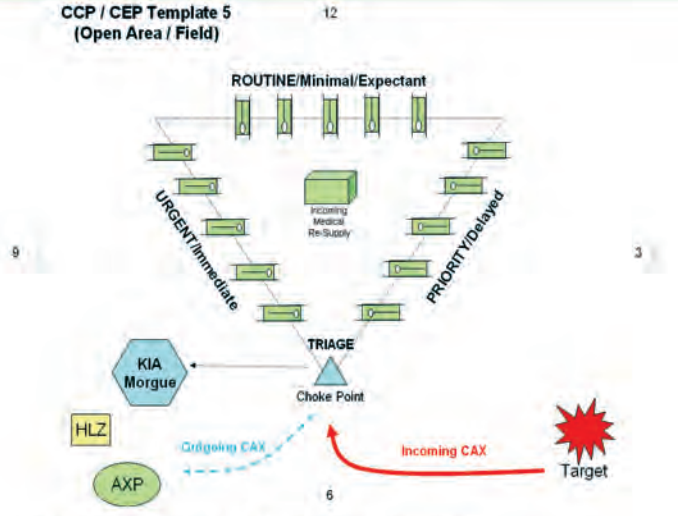
- Use as a TEMPLATE
- Use as a Guideline
- Modify based on the objective and circumstances

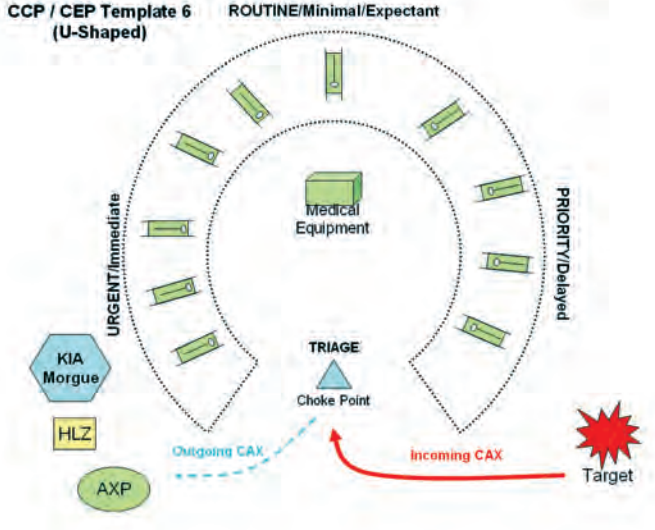

CCP / CEP Template 1
(Adjacent to Breech)
HLZ
Incoming CAX
Outgoing CAX
AXP
Breech
Choke Point
TRIAGE
URGENT/Immediate
KIA
Morgue
PRIORITY/Delayed
Incoming
Medical
Re-Supply
ROUTINE/Minimal
ROUTINE/Expectant
Incoming CAX
Outgoing CAX


CCP / CEP Template 2
(Flow Through Style)
HLZ
Outgoing CAX
AXP
Choke Point
EXIT
URGENT/Immediate
Incoming
Medical
Re-Supply
PRIORITY/Delayed
KIA
Morgue
ROUTINE/Minimal
ROUTINE/Expectant
Incoming CAX
Outgoing CAX
Choke Point
ENTRANCE
Incoming CAX
Incoming CAX


CCP / CEP Template 3
(Building - Rooms)
Target
Incoming CAX
HLZ
Outgoing CAX
AXP
Incoming Medical Re-Supply
Choke Point
TRIAGE
URGENT/Immediate
PRIORITY/Delayed
KIA Morgue
ROUTINE/Minimal
ROUTINE/Expectant
Incoming CAX
Outgoing CAX


CCP / CEP Template 4
(Building – Open/Hanger)
Target
Incoming CAX
HLZ
Outgoing CAX
AXP
Incoming Medical Re-Supply
Choke Point
TRIAGE
URGENT/Immediate
PRIORITY/Delayed
KIA Morgue
ROUTINE/Minimal
ROUTINE/Expectant
Incoming CAX
Outgoing CAX


CCP / CEP Template 5
(Open Area / Field)
12
ROUTINE/Minimal/Expectant
URGENT/Immediate
PRIORITY/Delayed
Incoming Medical Re-Supply
TRIAGE
KIA Morgue
Choke Point
HLZ
Outgoing CAX
Incoming CAX
Target
AXP
6


CCP / CEP Template 6
(U-Shaped)
ROUTINE/Minimal/Expectant
URGENT/Immediate
PRIORITY/Delayed
Medical Equipment
TRIAGE
KIA Morgue
Choke Point
HLZ
Outgoing CAX
Incoming CAX
Target
AXP

General Guidelines for CCP Personnel

- Maintain Security
- Maintain Command & Control
- Maintain Adequate Treatment
- Maintain Situational Awareness
- Maintain Organization
- Maintain Control of Equipment & Supplies
- Maintain Accountability

Casualty Marking and Tagging

- **COLOR CODING FOR TRIAGE & EVACUATION**
  - Chemlights, colored engineer tape, or triage tags, will be used to color code as follows:

RED	Immediate / Critical (Urgent & Urgent-Surgical)
GREEN	Delayed / Priority
BLUE	Expectant / Routine
NONE	Minimal / Convenience

Hazardous Training Medical Coverage Checklist

- **DEFINITION**
  - Planning, coordination, and execution of backside administrative medical coverage for high-risk or hazardous training events conducted by SOF units
- **TYPICAL EVENTS REQUIRING MEDICAL COVERAGE**
  - Airborne operations
  - Fast-rope operations (FRIES)
  - Road Marches (greater than 12 miles)
  - Maneuver Live Fires
  - Demolitions/Explosives
  - Other events deemed hazardous / dangerous on risk assesment
- **MEDICAL COVERAGE DUTIES & RESPONSIBILITIES**

1. Senior Coverage Medic

- Plan & coordinate medical support requirements & considerations
- Identify Hospitals and evacuation routes
  - Conduct Hospital Site Survey as required
  - Conduct face-to-face with hospital ER
  - Conduct route recon from target to hospital
- Establish target medical coverage plan and casualty flow
- Brief OIC/NCOIC medical support plan
  - Clarify OIC/NCOIC responsibilities and guidance
  - Clarify Medical responsibilities and guidance
- EXECUTION Duties:

- Patient Treatment & Monitoring on target and en route
- Advise OIC/NCOIC as required
- Update OIC/NCOIC/Higher HQ on condition of evacuated casualties
- Inform unit medical officer of all casualties

2. OIC / NCOIC of Event

- Overall responsible for administrative coverage (including medical)
- Request / track external medical support requirements
- Ensure appropriate type and number of vehicles with assigned drivers are dedicated to medical coverage
- Ensure appropriate communications equipment is allocated to medical personnel
- Link medical coverage plan with overall administrative coverage plan
- EXECUTION duties
  - Collect casualty data and report to higher HQs
  - Request MEDEVAC
  - Identify and establish MEDEVAC HLZ

➢ **DETERMINE COVERAGE REQUIREMENTS**

- Determine medical support requirements based on type of training and appropriate SOP/Regulation.
  - Your element's 350-2 Airborne SOP (ASOP)
  - Your element's 350-6 FRIESSOP
  - Local Installation and Range Control Regulations / Guidelines
  - Training Area specific requirements
- Coordinate and request appropriate equipment, vehicles, personnel, and support assets

DROP ZONE REQUIREMENTS

➢

Total Number Of Jumpers / Medical Support Requirements	1 to 60	61 to 120	121 to 240	241 to 360	361 to 480	481 to 600	601 to 720	Airland
Medical Officer	**N/A**	**N/A**	**N/A**	**N/A**	**1**	**1**	**1**	**N/A**
Senior Medic	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Aidman	**N/A**	**1**	**2**	**2**	**3**	**3**	**4**	**1**
Ambulance w/commo	**1**	**1**	**2**	**3**	**4**	**4**	**4**	**1**
Communications	**1**	**2**	**3**	**3**	**5**	**5**	**6**	**2**
5% Jump Injuries	3	6	12	18	24	30	36	**N/A**

- Request/Purchase/Acquire appropriate maps of training areas, adjacent military installations, and cities
  - Military Grid Reference System (MGRS)
  - Civilian Maps (Rand McNally, DeLorme, etc…)
  - Strip Maps / Site Published Maps
- Conduct map and ground recon of training areas (specifically key entrance & exit points).
- Note map problems/errors
- Identify hospitals/fire/EMS locations

➢ **IDENTIFY SPECIAL COVERAGE CONSIDERATIONS**
- Weather
- Animals
- Plants
- Terrain hazards (high angle or high altitude)

➢ **IDENTIFY HOSPITALS**
- Primary and Alternate evacuation hospital
- One should be a Level 1 Trauma Center
- Conduct hospital site survey and face-to-face
- Determine Hospital Communications:
  - ER Phone Line
  - ER Ambulance Line
  - Patient Admin Phone Line
  - Security Line Phone Line
- Determine Routes and Directions to hospitals
- Where are special injuries evacuated?
  - Neurosurgical
  - Burns
  - Trauma Centers
    - Level 1
      - Neurosurgeon on staff 24 hours
    - Level 2
      - Neurosurgeon on call, but not on site 24/7

➢ **VEHICLE REQUIREMENTS**
- **Driver:** A dedicated driver – NOT the Medic covering the event. Must be familiar with training area and evacuation routes.
- **Ambulance:** A covered vehicle capable of carrying <u>at least 1 litter</u> with spine-board attached. The vehicle must provide <u>environmental control</u> and <u>adequate space</u> for medical equipment. Mark vehicle as appropriate (ambulance symbols or lights).
  - Optimal Vehicles:
    - Van (15PAX only)
    - Large SUV (Expedition, Tahoe, etc…)
    - FLA (M996/M997)
  - Suboptimal Vehicles

        - Open HMMWV / GMV
        - Unit specific assault vehicles(tactical operations only – not for admin coverage)
        - Small SUV (Explorer, Durango, Cherokee, etc…)
        - Small Van (7PAX)

- **EQUIPMENT REQUIREMENTS**
  - Standard Medical Equipment
    - Spinal Immobilization/Stabilization
    - Splint Sets (Quick Splints)
    - O2/Masks/BVM
    - Suction, Electric
    - KED/Oregon Spine Splints
    - Traction Splint
    - Vital Signs Monitor (Propaq, PIC, LifePak)
    - Litters (Raven/Skedco/Talon)
    - Blankets
    - MAST
    - Pain Control
  - Special Equipment Considerations
    - Cold Weather
      - REPS (Rescue Wrap & Patient Heaters)
      - Thermal Angels
    - Hot Weather
      - Fans (battery operated)
      - Cold Packs
    - Burns
- **COMMUNICATION REQUIREMENTS**
  - Equipment
    - FM & MX frequency capable radios
    - Cell Phone
  - Radio Nets
    - Administrative Coverage (DZSO Net)
    - Exercise Target Control (O/C Net)
    - Tactical Nets
  - En route Communications
    - Cell phone to notify receiving facilities
- **MEDEVAC REQUEST PROCEDURES**
  - Military Installation
    - MEDEVAC unit and location
    - Request Procedures
      - Range Control?
      - MEDEVAC Freq?
      - Request format (other than 9-Line)
      - Aircraft / HLZ requirements/considerations

- Civilian Life Flight
  - Contact Numbers & Procedures
    - Direct Line and Alternate Contacts (State Police)
  - Special Aircraft Considerations
    - Aircraft Capabilities / Limitations
    - Aircraft / HLZ requirements/considerations
- HLZ Marking Requirements

➢ **ADMIN CASUALTY FLOW**
- Point-of-Injury to Home Station
- Casualty Flow on the Target / DZ to CCP or HLZ
  - Tactical to admin link-up and patient turnover
- From the target to hospital
- From hospital to home station

*General Rule: All casualties go through tactical medical channels unless life, limb, or eyesight is threatened.

➢ **TACTICAL DROP ZONE COVERAGE FOR EXERCISES**
- All casualties go through tactical evacuation channels unless life, limb or eyesight is threatened.
- No vehicles enter the drop zone without DZSO permission and tactical commanders notification
- Minimize white lights
- Minimize impact on tactical operations remaining off the DZ unless directed otherwise
- If possible, use tactical vehicles/assets to transport to admin CCP sites

➢ **PRE-COVERAGE INSPECTIONS**
- ALWAYS CHECK YOURSELF AND INSPECT SUBORDINATES
- Inspect / Inventory Medical equipment
  - Inventory against Hazardous Coverage Checklist
  - Function check mechanical devices & Monitors
  - Check Batteries
  - Aidbags
- Check Vehicle(s)
  - PMCS
  - Fuel Level
  - Dispatch
  - Map/Routes
- Support Equipment
  - Communications Equipment
  - Strobe lights / flashlights / head lamps
  - Night vision
  - GPS

BURN QUICK REFERENCE GUIDE

TYPE OF INJURY

- **First Degree:** superficial, involving only epidermal damage
  - erythematous and painful due to intact nerve endings
  - heal in 5 to10 days; pain resolves within 3 days
  - no residual scarring
- **Second Degree:** partial thickness, involving the epidermis and dermis
  - more superficial burns are moist and blister; deeper burns are white and dry, blanch with pressure, and have reduced pain
  - heal in 10 to14 days
  - can develop into third degree burns with infection, edema, inflammation and ischemia
  - treatment varies with degree of involvement - grafting is indicated for deep burns
- **Third Degree:** full-thickness, most severe of burns
  - results in necrosis and avascular areas
  - tough, waxy, brownish leathery surface with eschar, numb to touch
  - grafting required
  - usually have permanent impairment
- **Fourth Degree:** full-thickness as well as adjacent structures such as fat, fascia, muscle or bone
  - reconstructive surgery is indicated
  - severe disfigurement is common

BODY SURFACE AREA (BSA)

- **Adult**
  - "rule of nines": each arm is 9% of BSA, leg is 18%, anterior trunk is 18%, posterior trunk is 18%, head is 9%, and perineum is 1% (see chart)
- **Children**
  - BSA varies with age (children have a larger percentage of body surface area which exaggerates fluid losses)
  - children under 10 years old should be evaluated by the Lund-Browder burn chart (see chart)
  - quick method : the patient's palm is 1% of the total body surface area

SEVERITY

- **Minor:**
  - partial thickness: < 15% BSA in adults, < 10% BSA in children
  - full thickness: < 2% BSA
- **Moderate:**
  - partial thickness: 15%-25% BSA in adults, 10%-20% BSA in children
  - full thickness: 2%-10% BSA
- **Major:**
  - partial thickness: > 25% BSA in adults, > 20% BSA in children
  - full thickness: > 10% BSA
  - burns of hands, face, eyes, ears, feet or perineum
  - associated injuries, such as inhalation injury, fractures, other trauma
  - poor risk patients with underlying disease or suspicion of child abuse

(http://www.peds.umn.edu/divisions/pccm/teaching/acp/burns.html)

In children weighing less than 30kg the infusion rate is estimated at 3cc/kg/%TBSA. Plan to give ½ of the estimated fluid over the first 8 hr. Children will also need maintenance fluids of 5% dextrose in ½ normal saline. This should be given using a rule such as the 4-2-1 rule: 4cc/kg/hr for the first 10 kg, 2cc/kg/h for the next 10 kg, and 1cc/kg/h for the next 10 kg. If a patient's resuscitation has been delayed by a few hours, then give fluid more rapidly.

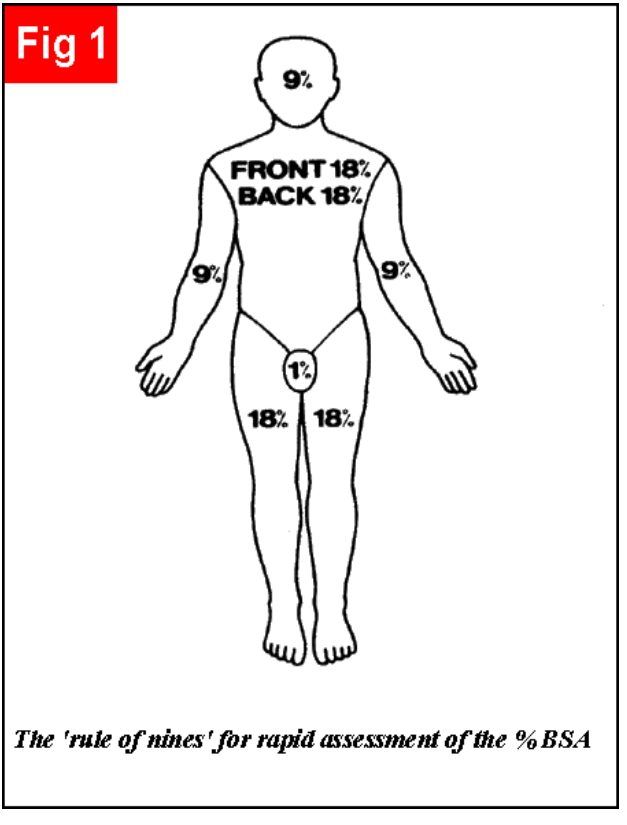
Adjust the initial fluid infusion rate to the urine output. Failure to monitor and record the urine output (catheter or bedpan) and adjust the fluid rate hourly may result in death or in severe complications. Adequate urine output is 30–50cc/hr in an adult and 1cc/kg/hr in a child who weighs less than 30kg. If the output is greater, or less than, the target for 2 consecutive hours, decrease, or increase, the IV rate by 20% respectively until the rate is satisfactory.
(*Special Operations Forces Medical Handbook, 2nd Edition*)

Rule of 10 for Fluid Resuscitation of Burn Victims

(a) Initial rate is 10ml per %TBSA per hour for a maximum casualty weight of 80kg.

(b) Add 100ml/hr to the rate for each 10kg above 80kg.

(c) Example: A 90kg casualty with 50% TBSA burn would receive an initial rate of (10ml x 50)/hr + 100ml/hr or 600ml/hr.

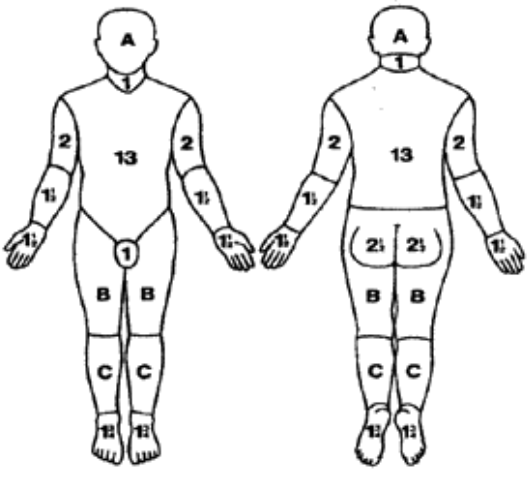


(Retrieved from http://www.nda.ox.ac.uk/wfsa/html/u10/u1010p02.htm)

CHART FOR ESTIMATING SEVERITY OF BURN WOUND

NAME_____WARD_____NUMBER_____DATE_____
AGE_____ ADMISSION WEIGHT_____

LUND AND BROWDER CHARTS



IGNORE SIMPLE ERYTHEMA

Partial thickness loss (PTL)
Full thickness loss (FTL)

REGION	% PTL	% FTL
HEAD		
NECK		
ANT. TRUNK		
POST. TRUNK		
RIGHT ARM		
LEFT ARM		
BUTTOCKS		
GENITALIA		
RIGHT LEG		
LEFT LEG		
TOTAL BURN		

RELATIVE PERCENTAGE OF BODY SURFACE AREA AFFECTED BY GROWTH

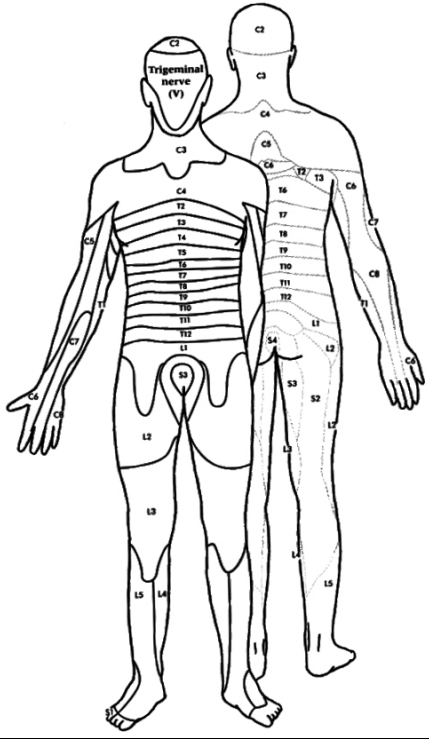
AREA	AGE 0	1	5	10	15	ADULT
A=½ OF HEAD	9½	8½	6½	5½	4½	3½
B=½ OF ONE THIGH	2¾	3¼	4	4½	4½	4¾
C=½ OF ONE LEG	2½	2½	2¾	3	3¼	3½

The Lund and Browder chart for accurate assessment of the % BSA

Fig 2

(Retrieved from http://www.nda.ox.ac.uk/wfsa/html/u10/u1010p02.htm)

DERMATOMES (Retrieved from http://web1.d25.k12.id.us/home/hhs/sportsmed/dermatomes.htm)



LUMBOSACRAL NERVE ROOT COMPRESSION			
ROOT	***MOTOR***	***SENSORY***	***REFLEX***
L4	Quadriceps	Medial foot	Knee jerk
L5	Dorsiflexors	Dorsum of foot	Medial hamstring
S1	Plantarflexors	Lateral foot	Ankle jerk

GLASGOW COMA SCALE		
EYE OPENING	***VERBAL ACTIVITY***	***MOTOR ACTIVITY***
1 None	**1** None	**1** None
2 To pain	**2** Incomprehensible	**2** Extension to pain
3 To command	**3** Inapropriate	**3** Flexion to pain
4 Spontaneous	**4** Confused	**4** Withdraws to pain
	5 Oriented	**5** Localizes pain
		6 Obeys commands

NOTES:

UNITED STATES SPECIAL OPERATIONS COMMAND
ATTN: SOCS-SG
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MacDill AFB, FL 33621-5323
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