TRAUMA EMERGENCIES PROTOCOL

This Trauma Protocol section covers the following emergencies:

- Trauma Emergencies with management of specific injuries
- Pneumothorax management
- Tranexamic Acid (TXA)
- Spinal Motion Restriction (SMR)
- Burns
- ENT Injury
- Adult crushing trauma
- Trauma arrest
- Trauma triage protocols

TRAUMA EMERGENCIES

GENERAL CONSIDERATIONS

A. Perform scene size-up to establish scene safety, number of patients and mechanism of injury. Request additional resources as needed. Begin assessment of the patient(s), looking for immediate life-threats first. Stay systematic: “ABCDE, IV, O2, ECG” should be your mantra; avoid getting distracted by visually impressive injuries that are not as critical as other, more subtle ones.

B. Rapid Trauma Assessment and recognition of major/multiple system trauma is essential to the subsequent treatment. Identify life-threats; chief complaints; assess airway and initiate appropriate therapies; assess breathing and initiate appropriate therapies; assess circulation and control major bleeding; establish a general impression of patient condition and prioritize patient for transport.

C. Avoid the Trauma “Triad of Death”: Hypothermia, Coagulopathy and Metabolic Acidosis. Do this by using warm blankets, turning up the heat in the ambulance, controlling bleeding and using TXA where appropriate, and avoiding overly aggressive IV fluid resuscitation – use permissive hypotension in trauma patients (see below)

D. Special attention must be paid to the State of Ohio field trauma triage criteria, listed at the end of this protocol, when determining whether patient should be made a trauma alert and get transported to a trauma center. The prehospital provider on scene must use the triage criteria to quickly determine the appropriate receiving facility and method of transport (ground vs. aeromedical transport – See Transport Policy)

E. Transport MUST NOT BE DELAYED! Every effort should be made to limit on-scene time to 10 minutes or less.

F. In the event of a Mass Casualty Incident (MCI), the SALT triage system (Sort, Assess, Life-saving interventions, Treatment/Transport) shall be used.

G. With pregnant trauma patients, the fetus may compress the iliac vessels, inferior vena cava and the abdominal aorta when the mother is supine. To minimize the effects of the fetus pressure on venous return place a wedge (pillow) under the right abdominal flank or hip, apply continuous manual displacement of the uterus to the left or tilt the backboard to the left.

H. Pediatric vital signs, equipment sizes and medication doses must be accurate during trauma resuscitation and all vary based on weight (most accurate), age and patient length. Utilize decision support tools such as the Pedi STAT app, Children's National BlueCard app, the Broselow tape or other aids to ensure rapid and accurate dosing in children.

I. If the patient is entrapped or inaccessible, contact Medical Control and advise of condition and circumstances. Document reason for prolonged on-scene time.

Basic EMT

A. Urgent Patient
   1. Maintain spinal motion restriction (SMR) if mechanism suggests spinal injury.
   2. Control life-threatening hemorrhage by appropriate method.
   3. Assess and manage airway:
      a. Administer oxygen as needed to treat shock and/or respiratory distress.
      b. Apply pulse oximeter and treat per pulse oximeter procedure.
   4. Perform a Rapid Trauma Assessment – quick head-to-toe survey to find additional life and/or limb-threatening injuries.
   5. TRANSPORT IMMEDIATELY (ALS intercept when available). During transport:
   6. Continue management of ABCs. Treat shock per Shock Protocol.
   7. Evaluate patient's pulses, skin color and temperature, and nerve function distal to fractures/injuries. Splint individual fractures if time permits
   8. Obtain relevant history of condition and determine **OPQRST** and **SAMPLE**, especially the where, when, and how regarding mechanism of injury.
   9. Contact Medical Control and advise of patient condition.
   10. Perform Detailed Physical exam and Ongoing Assessment during transport – head-to-toe assessment to identify additional injuries and to assess the effectiveness of treatments to this point.
   11. Obtain vital signs every 5 minutes. Urgent trauma patients are inherently unstable and can change/decompensate without warning
   12. Activate trauma team as early as possible prior to hospital arrival if patient meets trauma activation criteria

B. Non-Urgent Patient
   1. Maintain spinal motion restriction (SMR) if mechanism suggests spinal injury.
   2. Assess and manage airway.
   3. Administer oxygen as needed to treat shock and/or respiratory distress.
   4. Apply pulse oximeter and treat per pulse oximeter procedure.
   5. Control hemorrhage by appropriate methods.
   6. Perform focused exam on injured area
   7. Splint all fracture(s). (In Non-Life-Threatening situations ONLY)
   8. Evaluate and document pulses, skin color and temperature, and nerve function distal to injury before and after splinting.
   9. Obtain relevant history of condition and determine **OPQRST** and **SAMPLE**, especially the where, when, and how regarding mechanism of injury.
   10. Perform Detailed Physical exam and Ongoing Assessment during transport – head-to-toe assessment to identify additional injuries and to assess the effectiveness of treatments to this point.
   11. Contact Medical Control and advise of patient condition and transport.
   12. Though the non-urgent trauma patient may initially seem to have only minor injuries that are not life-threatening, trauma patients can be deceptively subtle and decompensate without warning. Remain vigilant and watch for declining neurological status and/or developing hypovolemic shock.

C. Mental Status – Glasgow Coma Scale (GCS) Adult vs Pediatric
Best possible score: E4, V5, M6 = 15
Worst possible score: E1, V1, M1 = 3 (not zero)

Use the GCS to document trends (positive or negative) in the patient's mental status. Use their BEST response when calculating their GCS score at any given moment. Inform the hospital prior to arrival if things change en-route to the ED

ADULT and CHILD > 2 yo GCS:

Eye Opening	Open spontaneously (+4)
	Open to verbal stimuli (+3)
	Open to pain only (+2)
	No response (+1)
	Not testable due to trauma, edema, etc (NT)
Verbal Response	Oriented/appropriate (+5)
	Confused (+4)
	Inappropriate words (+3)
	Incomprehensible words/sounds (+2)
	No response (+1)
	Not testable because intubated, etc (NT)
Motor Response	Obeys commands (+6)
	Localizes to pain (+5)
	Withdraws to pain (+4)
	Flexor posturing to pain (+3)
	Extensor posturing to pain (+2)
	No response (+1)
	Not testable because sedation/paralysis, etc (NT)

PEDIATRIC GCS <= 2 YEARS OLD:

Eye Opening	Open spontaneously +4
	Open to verbal stimuli +3
	Open to pain only +2
	No response +1
Verbal Response	Coos, babbles +5
	Irritable cries +4
	Cries in response to pain +3
	Moans in response to pain +2
	No response +1
Motor Response	Moves spontaneously/purposefully +6
	Withdraws to touch +5
	Withdraws to pain +4
	Flexor posturing to pain +3
	Extensor posturing to pain +2
	No response +1

D. Management of specific injures – see Specific Injuries table below

Advanced EMT

A. Start IV NS to maintain perfusion. Do NOT delay transport to start IV. If patient is hypotensive and symptomatic administer normal saline IV bolus:
   1. 250 – 500 ml for adults

   2. Repeat boluses as needed to maintain a systolic blood pressure of ≥ **90 mmHg in** adults and children ≥ 10 yrs. We practice permissive hypotension in polytrauma patients to avoid clot disruption and the "Trauma Triad of Death" (hypothermia, coagulopathy, metabolic acidosis) from overly aggressive resuscitation

3. Know that in adult patients with isolated head injury/TBI, a BP systolic of ≥ 90 mmHg is the bare minimum, but a slightly higher BP systolic (i.e. administering additional IV fluids) is associated with decreased mortality. Although a BP systolic of 144 mmHg is associated with the lowest mortality rate in adult TBI, this is not always achievable in the field. In practice for EMS, the goal BP systolic should be ≥ 110 mmHg in adult patients with isolated TBI. Do NOT use pressors to achieve this BP goal.

4. 20 ml/kg for pediatric patient (to a maximum of 500 ml) to avoid hypotension for age

   Definition of Pediatric Hypotension:

   - Patient ≥ 10 yrs: BP systolic < 90 mmHg
   - Children 1-9 yrs: BP systolic < 70 + [2 x age (yrs)] mmHg
   - Infants (1mo-1yr): BP systolic < 70 mmHg
   - Neonates (< 1mo): BP systolic < 60 mmHg

5. The Shock Index (SI) is a sensitive indicator of occult shock, especially in trauma with acute hemorrhage, and can predict risk of 24-hour mortality. In patients with hemorrhage (or all-cause hypovolemia – e.g. nausea vomiting diarrhea patients), you should calculate and document the Shock Index (SI):

   ADULT Shock Index:

   SI = HR / BPsystolic

   SI = 0.5-0.7 = Normal
   SI = 0.9 = ~Questionable, possibly pain/fear
   SI = 1.0 or higher = Danger zone

   PEDIATRIC Shock Index/Shock Index Pediatric Adjusted (SIPA):

   SIPA = HR / BPsystolic
   Ages 4-6 > 1.22 = Danger zone
   Ages 7-12 > 1.00 = Danger zone
   Ages 13-16 > 0.9 = Danger zone

   Though these ranges are approximate, a higher shock index should make your more suspicious of serious hidden injury (i.e. internal bleeding/organ damage or all-cause hypovolemia), get more aggressive with IV fluids, and be more likely to activate a trauma team. When in doubt, discuss with online medical control

B. Apply Cardiac Monitor and check rhythm

C. See Pain Management Protocol as needed

PARAMEDIC

A. Use Tranexamic (TXA) as needed -see below

HEAD

Basic EMT

Evaluate patient condition: level of consciousness, pupil size / reaction, GCS

Check blood sugar

Transport with head elevated 30º while maintaining spinal motion restriction (SMR)

Assess and manage airway; support with 100% oxygen by NRB or BVM

Hyperventilate (rate of 20/min for adult, 25/min for child, 30/min for infant) ONLY when there are signs of cerebral herniation! – blown pupil, bradycardia, HTN, posturing. ($ETCO_2$ target level is 30-35 mmHg)

Do NOT use occlusive dressings in nose/ears. Allow fluid to drain freely if present.

Monitor and be prepared for vomiting.

Advanced EMT

Advanced airway management should be accomplished gently with spinal motion restriction (SMR)

Combat hypotension with NS IVFs. In trauma patients, goal is BPsys > 90 mmHg for adults, and BPsys > age-appropriate hypotension level in kids < 10 yo

Monitor for seizure activity

EMT-P

Cricothyrotomy may be indicated for airway control. Contact Medical Control for pediatric cric.

NECK / SPINE

Basic EMT

A cervical collar should be used if one or more of the following are met: Patient complains of or is found upon physical exam:

- Neck pain
- Spinal Tenderness
- Pain on palpation of neck
- Neuro deficits (numbness, tingling, weakness, loss / diminished sensation or motor weakness)
- Altered LOC, Impaired competence (from drugs, alcohol, head injury), unable to communicate (young child, dementia, language barrier, etc.) and a MOI suggestive for neck injury
- MOI for neck injury and other distracting injuries

Spinal Motion Restriction – see below

If patient is wearing a helmet – see Helmet Removal Procedure

Contact Medical Control and advise of patient condition. Spinal cord injuries may need to be transported to a trauma center. Refer to trauma alert criteria.

EARS

Basic EMT

Don't get "the big eye". Evaluate for signs of skull fracture, or other injuries that are more severe than the ear trauma itself

Utilize spinal motion restriction (SMR) as necessary depending on the mechanism of injury

Control bleeding with direct pressure or gauze.

Wrap in bulky dressing

Assess and document hearing ability/auditory acuity in both ears before you cover the ears

If there is a foreign body in the ear, document what it is, but do not attempt to remove it, especially if the ear has already sustained trauma

EYES

Basic EMT

Evaluate for signs of skull fracture, or other injuries that are more severe than the ocular trauma itself, use SMR if indicated

Penetrating: Do NOT remove any foreign body in the eye or orbit. Stabilize with dressing and cover with Styrofoam cup to avoid glancing blows. If patient will tolerate it, cover the "good" eye as well to minimize eye motion/pain

Blunt: Look for globe rupture or hemorrhage or laceration. *Gently* apply a sterile moist dressing. Apply no pressure to the eye at any time

Obtain visual acuity as early as possible. The eye may swell up and make this impossible later!

Burns: Irrigate with copious H2O or NS x 15 mins ASAP. Obtain name of culprit chemical if possible

Transport patient at 45º (semi-fowler's/semi-upright) unless other injuries prevent this

Contacts: Pt removes -> EMT removes -> If they're stuck, then tell the ED on arrival. Bring the lenses

EMT-P

Burns: 2 drops tetracaine in affected eye prior to irrigation, provided no allergies. Use a Morgan lens for irrigation. DO NOT use tetracaine if there is a penetrating injury

CVA: Acute unilateral painless vision loss may be a CRAO and should be a **stroke alert** if within time limit

NOSE

Basic EMT

Evaluate for signs of skull fracture, or other injuries that are more severe than the nasal trauma itself, use SMR if indicated

Assess and manage airway, typically gets compromised by bleeding or other trauma, not the nasal injury itself. Have suction turned on and ready. Support with 100% oxygen by NRB or BVM as necessary.

Do not use NPA devices; there may be nasal, facial, or skull fractures present

Position patient upright and tilted slightly forward, other injuries permitting

For nosebleeds, pinch nostrils with *continuous* pressure x 15 mins. Do not "cheat" and check for bleeding before 15 mins has passed

Cold pack on bridge of nose for swelling

EMT-P

Consider TXA - soaked gauze product nostril packing.

1. Soak a rolled-up 4x4 gauze pad in standard concentration TXA.
2. Have patient blow their nose to remove old clots.
3. Suction away any active bleeding
4. Pack nose with TXA-soaked gauze. Be sure not to insert 4x4 gauze all the way down into the nostrils; you always want to retrieve/grab it so it does not get lost/stuck inside the naris.
5) Resume standard BLS care as above.
6) Must transport if use TXA

SPECIFIC INJURIES

TEETH

Basic EMT

Evaluate for signs of skull fracture, or other injuries that are more severe than the dental trauma itself, use SMR if indicated

If the tooth is (likely) already out, place it in a protective solution:
- Saline-soaked dressing
- Whole milk
- Cell-culture medium ("Save a Tooth" – rarely available)

… and bring it to the ED with the pt

Handle the tooth by the chewing/enamel side only. Do NOT touch, wash, or scrub the roots

TONGUE

Basic EMT

Evaluate for signs of skull fracture, or other injuries that are more severe than the tongue trauma itself, use SMR if indicated

Single biggest danger is airway compromise. Assess and manage airway, typically gets compromised by swelling, blood loss, aspiration. Have suction turned on and ready. Support with 100% oxygen by NRB or BVM as necessary.

Position patient upright and tilted slightly forward, other injuries permitting

Control bleeding with direct pressure via gauze, so long as this will not obstruct airway and pt will tolerate it

EMT-P

Be prepared to aggressively manage airway. If the airway is becoming compromised, intervene early before swelling makes controlling it more difficult later. Primary tool is endotracheal intubation, but if this is not possible, cricothyrotomy may be necessary. Contact Medical Control for pediatric cric.

CHEST

Basic EMT

Sucking chest wound: Cover with non-porous dressing and seal on 3 sides or use a commercial seal

Flail chest: Stabilize flail segment with trauma dressing.

Provide supplemental O2 to maintain oxygen saturation

Advanced EMT / Paramedic

Pneumothorax / Hemothorax: Transport in position of comfort and monitor for tension pneumothorax development

Symptoms of tension pneumothorax:
- Chest pain or evidence of trauma
- Tachypnea
- Tachycardia
- JVD
- Diminished / absent breath sounds on affected side
- Resistance felt with BVM
- May initially present with hypertension progressing to hypotension
- Hyperresonance on affected side
- Tracheal deviation from affected side (LATE sign)

Perform needle / pleural decompression: **SEE BELOW**

IVFs if BP < 90 mmHg in adults* in case of **hemothorax** or cardiac **tamponade**

ABDOMEN / PELVIS

Basic EMT

Evisceration: Cover organs with sterile dressing moistened with saline.
Do NOT place exposed bowel or organs back into abdominal cavity. Lay patient flat and elevate knees.

Impaled Object: Secure penetrating object with bulky dressings. Do NOT remove it. Examine heart and lung sounds as well (Think "thorax trauma", not just abdominal injury)

Unstable Pelvic Fracture: An "open book" fracture is unstable/moves to palpation, exhibits hemodynamic instability, has a high-energy mechanism of injury. Apply circumferential stabilization with commercial pelvic binder. If commercial device unavailable, consider wide sling made from bedsheet

Advanced EMT/Paramedic

For all of the above conditions: BLS interventions, plus supplemental O2 or advanced airway management, IV pain meds, IVFs for BPsys < 90 mmHg in adults*

Blunt trauma: #1 injured organ is liver. Usually less visually impressive than penetrating injury. Give IVFs early for persistent tachycardia, even if pt is still normotensive. Monitor vitals q5 mins, watch for hypovolemic shock from internal hemorrhage

EXTREMITY

Basic EMT

Open Wounds: Control bleeding by most appropriate method:
- Direct pressure
- ITClamp
- CAT Tourniquet

Bleeding that is unable to be controlled with pressure / tourniquets, or injuries to axilla / groin, consider use of hemostatic agent if available.

Wound Packing: Recommended for injuries with wound cavities when direct pressure does not control bleeding or when the wound is located in a non-compressible area such as the groin, axilla, neck, or clavicle area.

Complete Amputations:
- Complete gross decon if needed
- Cover wound stump with sterile dressing and carefully bandage
- Attempt to find avulsed part, but do NOT delay transport.
- Transport avulsed part in cool, dry, sterile dressing

EMT-P

Complete Amputations with Crush: If a crush injury has occurred along with the amputation, utilize Adult Crushing Trauma protocol below

*or BPsys < age-appropriate hypotension level in children

PNEUMOTHORAX MANAGEMENT – NEEDLE DECOMPRESSION

General Considerations
Patients with severe blunt or penetrating chest trauma can develop pneumothorax (PTX). Left unchecked this can evolve into a tension pneumothorax, forcing the contents of the thorax laterally until it compresses the lungs and heart, cutting off cardiac output and ultimately proving fatal to the patient. Our goal is to insert a large bore needle into the pleural space to decompress/drain that developing air pocket before it causes critical compression of the thoracic contents

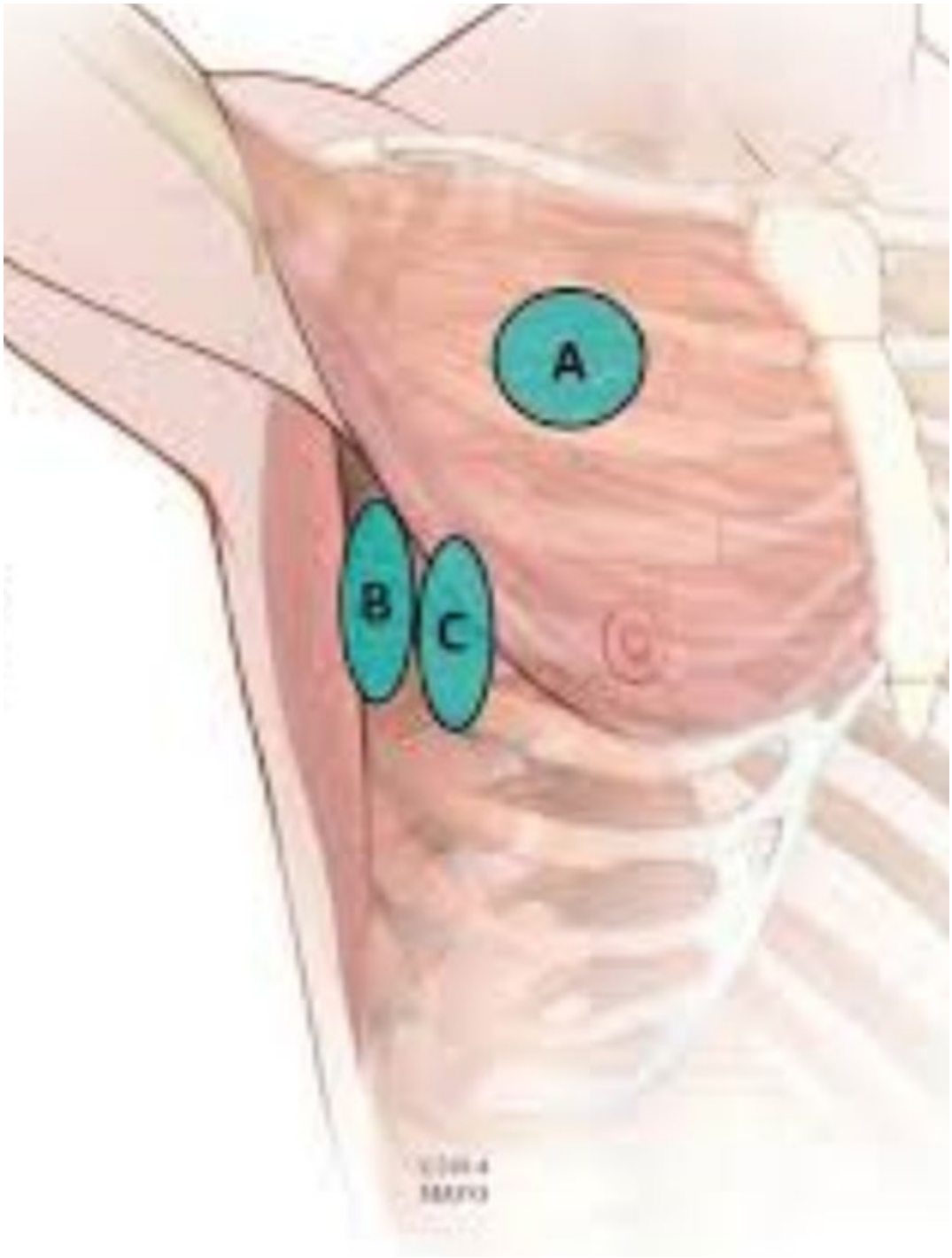
Provider Level: AEM-T & Paramedic

Indications:
- Trauma with respiratory distress or hypoxia
- Trauma with markedly diminished or markedly asymmetrical lung sounds
- Clinically suspected tension pneumothorax or developing tension pneumothorax

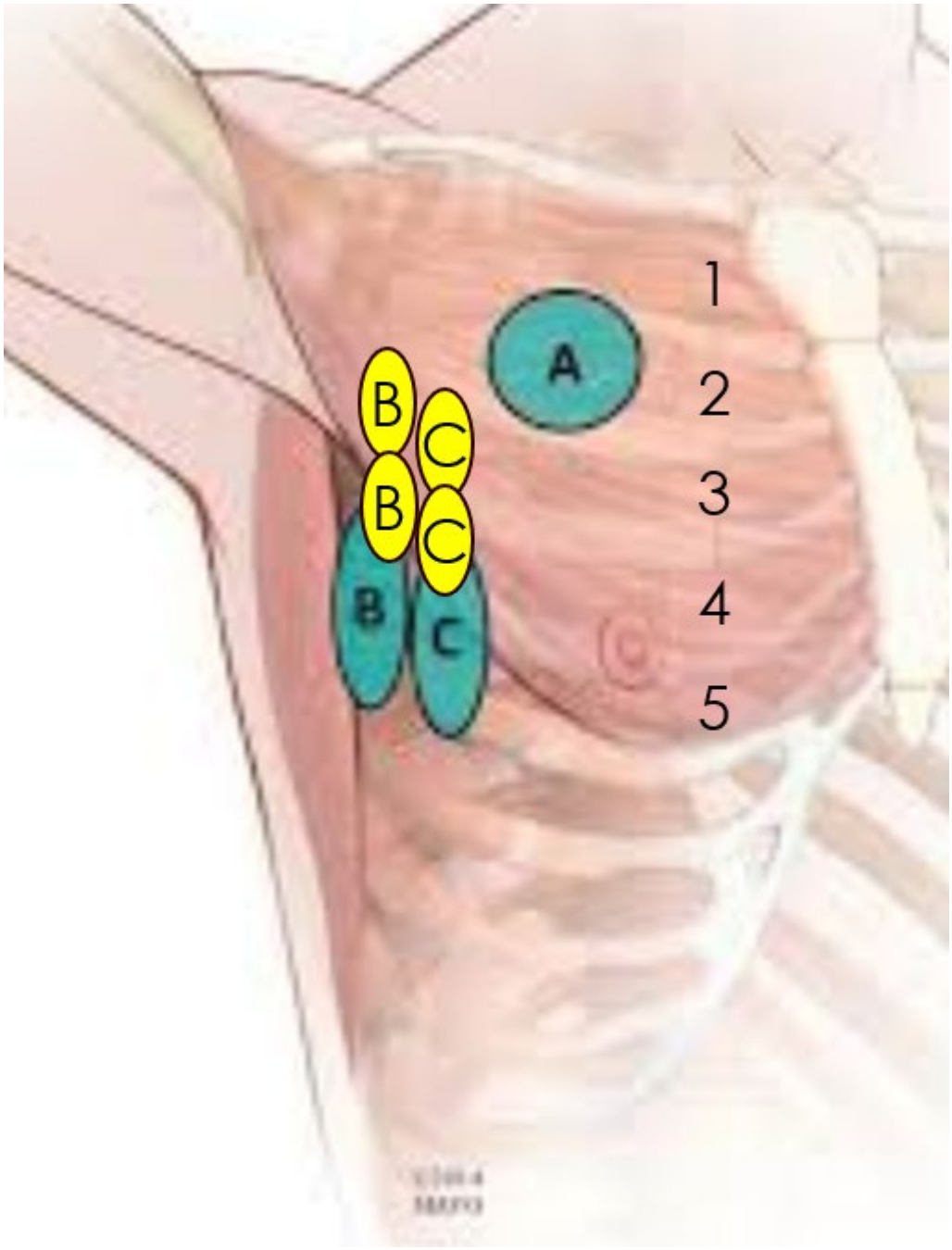
Contraindications:
- A "simple pneumothorax" (i.e. PTX suspected to be small volume, slightly asymmetrical or slightly diminished lung sounds, not causing any tension physiology) does not need to be decompressed/drained unless you suspect it is rapidly worsening or the patient is in respiratory distress
- A "simple pneumothorax" can fly. Medevac'ing a patient to a trauma center who may have a simple pneumothorax does not automatically mean that PTX must be decompressed prior to liftoff

Procedure:
- Expose and rapidly cleanse the chest wall with alcohol, shur-clens, or betadine
- Use a large-bore, long needle, preferably pre-made "chest darts" to ensure you can enter the pleural space. If none are available, use a 2.5 inch long 14-guage needle
- Select the THINNEST portion of the chest wall (may need to retract breast tissue away from chest wall) and select ONE of the following targets:
4^{th}-5^{th} intercostal space, mid-axillary line (B) OR 4^{th}-5^{th} intercostal space, anterior-axillary line (C) OR 2^{nd} intercostal space, mid-clavicular line (A). Recommend targeting 1-2 spaces superiorly in the mid-axillary line OR anterior axillary line in pregnant patients as abdominal contents will shift upward
- Place needle *perpendicularly* to the skin, just *above* the rib, and advance into the pleural space (you should hear/feel a rush/"hiss" of air). Additionally, you can attach a 10 mL NS syringe to the 14-guage needle. As you insert the needle, gradually withdraw on the syringe; you'll see air bubbles when you enter the pleural space

Note: In patients with large-size sucking chest wounds/open pneumothorax:
IF they are breathing on their own (i.e. negative pressure inspiration), you should apply a chest seal over the wound (separate from any needle decompression you perform)
IF you are breathing "for them" (i.e. positive pressure ventilation such as a BVM), you should NOT seal the wound – prevent the development of a pneumothorax by allowing the air to escape out of the chest wall instead



Needle thoracostomy locations in normal adult patient



Needle thoracostomy locations (yellow) in a pregnant adult patient

TRANEXAMIC ACID (TXA)

GENERAL CONSIDERATIONS

Tranexamic Acid (TXA) has existed for decades. Initially used to minimize bleeding during surgical cases, it is now used in the management of trauma patients and post-partum hemorrhage patients with severe hemorrhage and hemorrhagic shock. It is a medication that inhibits the breakdown of fibrin, and thus helps prevent clots from dissolving. By stabilizing the clot it allows the body a chance to "plug the holes" and stop or slow the rate of bleeding. TXA is most helpful with internal bleeding that cannot be otherwise controlled with direct pressure or a tourniquet, and is most helpful when given shortly after injury (ideally < 1 hour)

Provider Level: Paramedic ONLY

Indications for TXA use in hemorrhaging patients:

- Evidence of marked blood loss from traumatic injury (any age) or postpartum hemorrhage (> 12 yo) only
- Persistent tachycardia-for-age despite IV fluid resuscitation OR…
- Persistent hypotension-for-age despite IV fluid resuscitation OR…
- Major trauma with clear abdominal/pelvic injury
- Arterial bleeding you cannot stop with direct pressure or a tourniquet
- Nosebleed resistant to BLS measures

Contraindications:

- Isolated GI bleed
- Isolated head injury
- Non-hemorrhagic/non-traumatic shock (i.e. neurogenic shock or septic shock)
- Known allergy to TXA

Side Effects:

Hypotension (on rapid injection), arterial or venous thrombosis (if given > 3 hours after injury), dizziness, fatigue (may also be caused by patient's blood loss), headache, GI effects

Dose:

Patients **OVER** 12 years old:
Administer **2 Grams** IV/IO by slow push. Do not rapidly bolus. Do not use piggyback IV solution.
Standing order; no online medical control authorization required.

Patients **UNDER** 12 years old:
Administer loading dose **15 mg/kg (max 1 gram) over 10 minutes**, IV/IO. Do not rapidly bolus. Recommend diluting in 100 mL normal saline bag or 10-20 ml syringe to allow for a slow infusion over 10 minutes.
Next, start an infusion of **2 mg/kg-hr (max 125 mg/hr)** which will be continued over the next 8 hours.
Not a standing order. Online medical control authorization is required.

SPINAL MOTION RESTRICTION

Indication: This Protocol addresses the assessment and treatment for trauma patients with potential cervical, thoracic, or lower spinal injuries. When indicated, Spinal Motion Restriction, (SMR), is performed by the application of a rigid cervical collar.

1) SMR is to be applied to trauma patients meeting any of the following criteria:

- Patient complains of neck or upper back pain.
- Patient has or had motor weakness, numbness / tingling, or loss of feeling to any extremity.
- Patient has a MOI consistent with a possible spinal injury and:
  - Has an altered mental status, (i.e. is not A&O x4 or GCS is not 15).
  - Has a communications barrier preventing a complete and meaningful assessment, (e.g. Language barrier, young pediatric patients, patients with a CVA or dementia preventing or limiting assessment, patients with significant MR / developmental delay, etc.).
  - Exam suggests that the patient may be impaired based upon alcohol intoxication, drugs, or other medications.
  - Has a distracting injury, (i.e. other significantly painful injury which could mask symptoms from a spinal injury).
- Has pain or tenderness on palpation of the neck or upper thoracic spine.
- Has pain or tenderness on cervical range of motion assessment.

2) If the patient's MOI is such that a cervical spinal injury could exist, and they have not had SMR applied based upon the above criteria, then perform the **cervical range of motion (CRM) assessment**. Stop the assessment, have the patient return to the neutral position, and apply SMR if the patient experiences pain, discomfort, numbness or tingling to an extremity, or other such symptoms.

3) Otherwise, SMR is not indicated.

CERVICAL RANGE OF MOTION ASSESSMENT:

CRM assessment is ***not*** to be performed if the patient meets any of the SMR criteria above.

CRM testing is to be performed by the patient themselves, EMS personnel are not to move the patient's head.

Have the patient gently flex their cervical spine by bringing their chin down to their chest, and then extend their cervical spine by tilting backwards to look upwards. From the neutral position then have the patient rotate their head to the left and right, by bringing their chin over to towards their shoulders.

MECHANISM OF INJURY, (MOI): Trauma patients experiencing the following MOI's require a SMR assessment.

- Fall from standing position with the possibility of having hit their head
- Fall from any height
- Vehicle crash, (MVC, ATV, motorcycle, bicycle, snowmobile, skateboard, etc.)
- Pedestrian struck by a vehicle
- Swimming, diving, or near drowning incident
- High voltage or lightning injury
- Altercation with potential for spinal injury
- Other event consistent with a possible spinal injury

PATIENT'S MEDICAL RECORD: If a spinal care assessment was performed then clearly document on the patient's medical record why SMR was indicated or that it was not indicated.

BACKBOARD (LONG SPINE BOARD) UTILIZATION: The backboard is to be considered an extrication device, not a treatment modality or transportation device. Patients warranting SMR may be transported on the EMS cot with a rigid cervical collar in place and without a backboard, or CID, (head blocks, etc.).

If a backboard, KED, Reeve's stretcher, scoop stretcher, or similar device is utilized for extrication, most patients should be removed from them as soon as possible, i.e. prior to transport.

Backboards may be utilized for extrication and / or transport of major trauma patients, patients who are semiconscious / unconscious, for those who are otherwise difficult to move, or in whom possible pelvic or hip injuries preclude patient movement without the backboard. The backboard may be padded.

Application of the backboard to a standing patient (i.e. a “standing takedown”) is contraindicated.

Full body vacuum mattresses, (with or without a backboard for additional support), may be used for both extrication and transport as needed. Upon arrival to the ED, deflate the vacuum mattress, and staff will help you transfer the patient onto the ED stretcher using the hard slide board.

SELF-EXTRICATION/AMBULATION: Excluding major trauma/”load and go” patients, patients involved in a MVC should be assessed for SMR prior to their removal from the vehicle. If indicated, a rigid cervical collar should be applied while the patient is still within the vehicle. If the patient is able to do so, they may be assisted in exiting the vehicle with their c-collar in place without the use of either a short (KED) or long spine board (backboard). Manual stabilization of the patient's cervical spine by EMS personnel during extrication is an alternative to early cervical collar application.

The patient's motor and sensory exam of the extremities is to be assessed, (and subsequently documented), both prior to and following extrication.

A patient who is otherwise able to do so may walk several steps, with or without a rigid cervical collar in place, as indicated, to either a stair chair or cot. For example: A patient involved in an MVC who is experiencing neck pain could be placed in a rigid cervical collar while in the vehicle, and then be assisted in exiting the vehicle and walking several steps to a cot.

If spinal care assessment is deferred prior to extrication, the reason for doing so is to be documented in the patient's medical record, (e.g. patient in extremis, major trauma/”load and go” patient, vehicle was on fire, vehicle was under water, etc.).

LOW BACK PAIN: A patient with low back pain, without major trauma or pelvic injuries, and without indications as above for SMR, may be transported on the EMS cot without the use of a backboard. A full body vacuum mattress may be used if deemed appropriate to do so.

COT POSITIONING: A patient with or without a cervical collar in place may be transported in their position of comfort, (supine, partially reclined, or upright), barring other indications for specific positioning, (e.g. Supine for a patient in shock). Do not utilize Trendelenburg positioning, even for patients in shock; it is ineffective.

EXCLUSION CRITERIA: Penetrating injuries, (GSW, knife, etc.), to the head, neck, and torso do not require SMR unless the patient is awake and complaining of a new neurological, (motor or sensory), deficit, **and** immobilization can be performed without otherwise compromising the patient's airway management.

Patients experiencing an exacerbation of chronic back pain, without having experienced a new traumatic event, do not require SMR.

ALTERNATIVE IMMOBILIZATION OPTIONS: In patients for whom SMR is indicated, but from whom an appropriately fitting rigid cervical collar is not available, alternative methods of restricting the spinal motion may be employed. These include, but are not limited to, using a towel roll or a full body vacuum mattress.

HIGH RISK INDIVIDUALS: Keep in mind that geriatric patients, patients with prior spinal surgery, dialysis patients, and those with known metastatic cancer are at a higher risk of sustaining spinal injuries.

BURNS

GENERAL CONSIDERATIONS

A. The first priority is to assure scene safety and then remove the patient from heat and flame, electrical and/or chemical exposure.

B. When dealing with contaminated environments, EMTs must have appropriate PPE. If not available, contact appropriate HazMat team for assistance.

C. Remember the "ABCDE, IV, O2, ECG" mantra first and foremost. Airway, Breathing, and Circulation MUST be stabilized before attending to the burn.

D. Patient with extensive burns must be monitored for hypothermia. Avoid use of ice and/or cold compresses. When in doubt, cover with a dry dressing. Do not use wet dressings; this may actually cause the burn to enlarge. Keep the patient compartment of the ambulance warm (even if this means turning on the heat on a summer day) to prevent hypothermia, especially with extensive burns.

E. In caring for the burn patient, the EMT should:
   1. Stop the burning
   2. Reduce the pain
   3. Prevent contamination

F. For patients with critical burns, EMTs should contact Medical Control to advise them of patient's condition and request transport to the Burn Center. Squads should never pass the nearest acute care facility unless they are Advanced Life Support staffed (Paramedic) and are capable of providing total airway management as indicated (endotracheal intubation and/or surgical cricothyroidotomy). If the patient is BOTH a major trauma ("trauma alert") patient and a burn patient, patients shall be transported to the trauma center FIRST and a trauma alert activated, where they will be stabilized and their injuries addressed. Thereafter, the trauma center will handle transfer to a burn unit.

   Patients (who are NOT Trauma alerts) need to go directly to a burn center for burns to the:
   - Head/Face
   - Hands
   - Feet
   - Genitalia
   - Burns that cross a joint
   - Any 2nd burn > 10% TBSA
   - Any 3rd degree burn

G. Gross decontamination must be done at the scene. Advise receiving facility if complete decontamination was not done at the scene and be prepared to transport to decontamination area.

Basic EMT

A. Assess and manage airway. Apply Pulse Oximeter and treat per procedure.

B. Determine type of burn and treat as follows:

1. Thermal burn (dry and moist):
    a. Stop the burning process, i.e., remove patient from heat source, remove clothing.
    b. Prevent hypothermia (see above)
    c. If burn <10% body surface area (using rule of nines) cool down with Normal Saline, then pat dry.
    d. Cover burn areas with dry bulky dressing. Do not use wet dressings.

2. Radiation burns:
    a. Treat like thermal burns except if burn is contaminated with radioactive source, treat like a chemical burn.
    b. Wear appropriate PPE when dealing with contamination.
    c. Contact HazMat Team for assistance.

3. Chemical burns:
    a. Wear appropriate PPE when dealing with contamination
    b. Remove patient from contaminated area to decontamination site (NOT in squad)
    c. Determine chemical involved; contact appropriate agency for chemical information
    d. Eye injury - continuous flushing with Normal Saline for 10-15 minutes
    e. Remove patient's clothing and flush skin.
    f. Leave contaminated clothing / belongings at scene. Cover patient's anterior and posterior sides before loading into squad
    g. Patient should be transported by personnel not involved in decontamination process.
    h. Relay type of substance involved to Medical Control. If available, bring Safety Data Sheet (SDS - Formerly MSDS) with patient to the hospital.

4. Electrical burns:
    a. Shut down electrical source; do NOT attempt to remove the patient until electricity is CONFIRMED to be shut off.
    b. Assess for visible entrance and exit wounds and treat as thermal burns.
    c. Assess for internal injury, i.e., vascular / tissue damage, fractures, etc. and treat accordingly.

5. Facial and airway burns:
    a. Most facial burns are flash burns that do not compromise the airway, though the patient may sustain burns to face/neck, singed nasal hairs, or soot in sputum. Regardless, the airway should always be closely monitored; patients with potential airway compromise from burns are those with stridor, hoarse raspy voice, difficulty swallowing or speaking, an altered mental status, or those who sustain burns in an enclosed space.
    b. Provide 100% oxygen via NRB or BVM

C. Estimate extent (percentage of body surface area involved) and depth of burn (superficial, partial thickness, full thickness). Determine seriousness of burn (see chart).

D. Contact Medical Control and transport.

Advanced EMT / Paramedic

A. Refer to Advanced Airway Management Procedure as indicated. Intervene on any potentially compromised airway (stridor, hoarse raspy voice, difficulty swallowing or speaking, an altered mental status, or those who sustain burns in an enclosed space) sooner rather than later; burned airways may swell and make later intubation exponentially more difficult

B. Apply cardiac monitor and identify dysrhythmias, especially in high voltage (> 1,000 V) burns.

C. If signs and symptoms of hypovolemia are present (hypovolemic shock), start IV and treat per shock protocol. **Do NOT delay transport for IVs and AVOID multiple IV attempts.**

D. If the patient is *not* in shock, the following patients should receive IV fluid resuscitation:
- Burns with > 20% TBSA in adults and children
- Patients < 2 yo and > 65 yo with a burn of any size

E. The % TBSA burned and the Parkland Formula can be difficult to calculate in the field. Therefore, for patients *not* in shock but who meet the above criteria (D), administer IV fluids (Lactated Ringers preferred over Normal Saline if available), at the following rates:

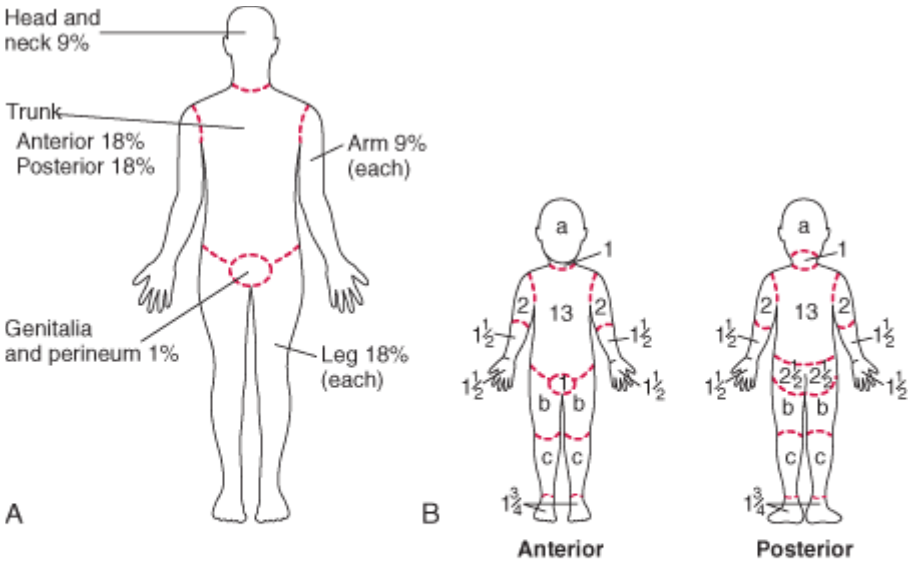
< 5 yo = 125 ml/hr
6-14 yo = 250 ml/hr
> 13 yo = 500 ml/hr

F. When calculating the % TBSA burned, only 2nd and 3rd degree burns are counted

G. Patients who are *not* in shock and do *not* meet the above criteria (D) should have an IV inserted with NS @ KVO rate only. This may be adjusted later in the ED.

H. For pain relief, see Pain Management Protocol.

RULE of NINES



Relative percentage of body surface area (% BSA) affected by growth

	Age				
Body Part	**0 yr**	**1 yr**	**5 yr**	**10 yr**	**15 yr**
a = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b = 1/2 of 1 thigh	2 3/4	3 1/4	4	4 1/4	4 1/2
c = 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

For irregularly-shaped burns: 1% TBSA is equal to the surface of the palm of the patient's hand AND their fully extended fingers combined

ADULT CRUSHING TRAUMA

Paramedic

A. Follow the Trauma Emergencies Protocol as indicated. Note that the doses of medications involved in this crushing protocol also apply to patients with hyperkalemia for other reasons (e.g. missed dialysis)

B. Institute this crush protocol if one extremity has been trapped for two or more hours or if two extremities are trapped for one or more hours. This protocol should not be used for simple crush injuries (e.g. hand stuck in car door), as it will potentially make subsequent resuscitation by trauma team more difficult. This protocol should be used on crush injuries involving complete amputation or those involving substantial soft tissue destruction/mangling/disintegration of the extremity.

C. Note that this protocol requires a considerable amount of Sodium Bicarbonate. Additional resources may be needed to achieve therapeutic effect. Smaller amounts of Calcium gluconate and Albuterol will also be required

D. <u>Prior to extrication:</u>

1. Coordinate time of release with rescue personnel. Team will have to "divide and conquer" – part of the crew extricates the patient while part of the crew resuscitates the patient simultaneously
2. If you can reach it, apply a CAT tourniquet proximal to the crush injury prior to extrication
3. Apply cardiac monitor. Obtain monitor tracing prior to and sequentially during further treatment
4. Establish at least one large bore IV, and start running a 1000 mL bolus of normal saline (NS). Do not use lactated ringers (LR)
5. Bolus 10% Calcium Gluconate 15-30 mL IV/IO over 2-5 minutes
6. Thoroughly flush the Calcium Gluconate in the line OR use a separate line to bolus 1 mEq/kg Sodium Bicarbonate (minimum dose is 50 mEq)
7. Administer at least one Albuterol nebulizer treatment after the Calcium Gluconate and Sodium Bicarbonate have been infused, even if the patient has no respiratory issues. This can wait until after extrication if time is a factor
8. Contact Medical Control and advise of the patient's crushing injury
9. Anticipate Crushing Syndrome and possible cardiac arrest upon extrication of the patient!

E. <u>After extrication:</u>

8. Add another 50 mEq Sodium Bicarbonate to a 1000 ml NS bag and infuse at a rate of 1000 ml/hr. Be sure to label every IV bag that has the sodium bicarbonate added to it
9. Monitor ECG closely. Watch for tall, peaked T waves or widened QRS complexes (> 0.12 seconds)

F. For pain relief, see Pain Protocol

G. Activate a Trauma Alert and transport to an appropriate trauma center

TRAUMA ARREST

GENERAL CONSIDERATIONS

A. Resuscitation should not be attempted in cardiac arrest patients with hemicorporectomy, decapitation, or total body burns, nor in patients with obvious, severe blunt trauma who are without vital signs, pupillary response and/or an organized or shockable cardiac rhythm at the scene.

B. Multiple blunt trauma victims who are initially found by EMS in cardiac arrest or found at the scene without vital signs may be considered dead and follow the DOA protocol.

C. Extensive, time-consuming care of the trauma victim in the field is usually not warranted. Unless the patient is trapped, they should be enroute to a medical facility within 10 minutes after arrival of the ambulance on the scene.

D. While CPR in the pulseless trauma patient is sometimes futile, several reversible causes of cardiac arrest in the context of trauma are correctible and their prompt treatment could be life-saving. These include hypoxia, hypovolemia, diminished cardiac output secondary to tension pneumothorax or large-volume hemothorax, and hypothermia.

E. Mechanism of injury should be considered when deciding resuscitative measures. Generally, trauma arrest resuscitation efforts have statistically low success rates. However, research has shown that penetrating injuries (e.g. hemo-pneumothorax) have a higher successful resuscitation rate (11.2%) versus severe blunt injuries (1.6%). If EMS chooses to attempt resuscitation, all measures should be taken including advanced airway, CPR, and appropriate medications. If EMS does not attempt resuscitation, clear documentation as to the criteria used to make this determination is required

F. When in doubt, WORK THE CODE. Give the patient the best possible chance for survival, especially in public places, emotionally charged situations, and pediatric cases

Basic EMT

A. In traumatic arrests, life-saving interventions (LSIs) come FIRST: Circulation, Airway, Breathing or “C-A-B”. Control life-threatening hemorrhage; apply tourniquet and/or hemostatic agent if indicated, THEN start CPR

B. Begin CPR with consideration of C-Spine; refer to Cardiac Arrest Protocol. Use standard ACLS procedures; CardioCerebral Resuscitation (CCR) does not apply to traumatic cardiac arrests

C. Maintain spinal motion restriction (SMR)

Advanced EMT / Paramedic

A. Emphasis on performing LSIs FIRST. Start IV NS to maintain perfusion. Do NOT delay transport to start IV

B. Airway management should progress from least invasive (BVM) to more invasive (supraglottic airway – King-LT, iGel, LMA) to most invasive (ETT, Cric) depending on the patient’s need

C. If mechanism of injury/examination makes you suspicious for a tension pneumothorax, perform needle decompression

D. THEN, start CPR. Treat dysrhythmias per dysrhythmia protocol

TRAUMATIC CARDIAC ARREST – FINGER THORACOSTOMY FOR HEMO/PNEUMOTHORAX

General Considerations

This is a last-resort procedure for patients who have suffered a traumatic cardiac ARREST, and is to be performed by paramedics ONLY. Needle decompression alone will not drain a hemothorax, so the goal of this procedure is to rapidly drain a hemothorax (in reality it will likely be a combination hemo/pneumothorax) in an attempt to decompress the thoracic contents and obtain ROSC

Provider Level: Paramedic ONLY

Indications:

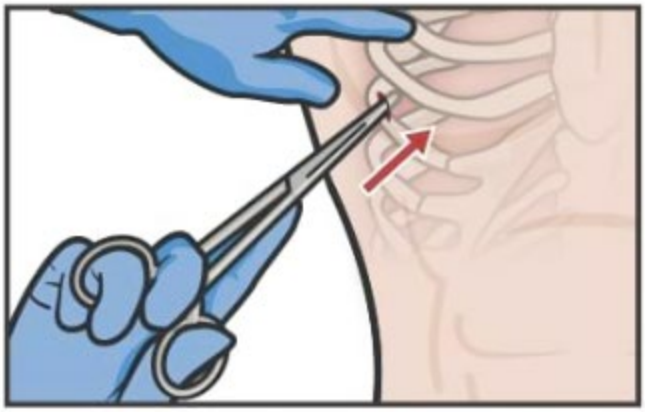
- Traumatic in cardiac arrest, recent
- Signs of thoracoabdominal trauma (bruising, stab wound, GSW, obvious blunt injury)
- Asymmetrical lung sounds with ventilation/suspected traumatic hemothorax

Contraindications:

- Patient is alive
- Patient has irrecoverable injuries obviously incompatible with life (e.g. decapitation, incineration)
- Patient has no signs of thoracoabdominal trauma (e.g. Patient with GSW to the head will not benefit)

Procedure:

- Select 4^{th}-5^{th} intercostal space, MID-AXILLARY LINE. Mid-clavicular line is NOT an option
- Insert scalpel into 4^{th}-5^{th} intercostal space, directly on top of (as a backstop for the blade) or just *above* the rib. Incision should be 2-3 cm long and extend down into the intercostal muscles
- Insert a Kelly clamp in a gliding fashion along the superior edge of the rib and apply pressure until you enter the pleural space with a distinct “pop”
- Open the Kelly clamp to spread the tissue apart wide enough to accommodate your finger
- With the jaws of the Kelly clamp still open, insert a gloved finger through the incision to make sure you’re in the pleural space. You should be able to touch the lung’s visceral pleural layer with your finger. Watch out for broken rib fragments!
- Gently sweep your finger back and forth x10-15 seconds to enlarge the aperture. Any large volume hemo/pneumothorax (if present) should rapidly drain out
- Do NOT insert a chest tube
- Check for ROSC



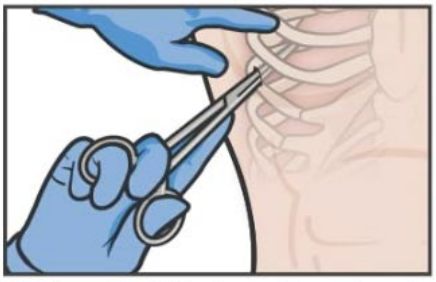
09 **MAKE AN INCISION** into the skin that is parallel to the rib.

(a) Incision should be a 2 to 3 centimeters (cm) parallel to the rib over the selected site or directly over the rib (providing a backstop for the blade) and extend down to the intercostal muscles.

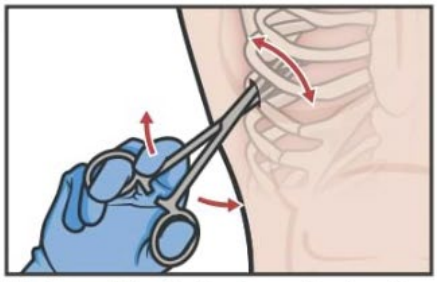
CAUTION: Avoid puncturing the lung. Always use the superior margin of the rib to avoid the intercostal nerves and vessels.

(b) With Kelly clamp, perform a blunt dissect through the soft tissue passing over the superior aspect of the rib and into the chosen intercostal space and puncture the parietal pleura.

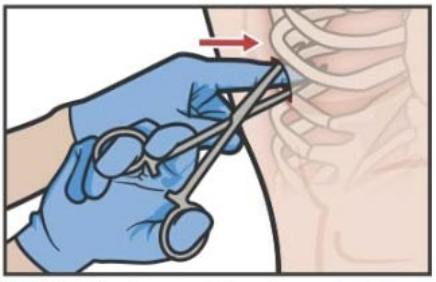
(c) Listen for and feel a "pop" as the points go into the cavity.



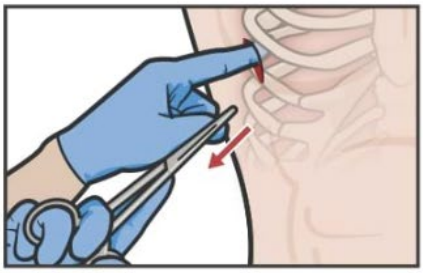
(d) Place the Kelly clamp, jaws closed on the rib and pointed toward the ICS above the rib.



(e) Spread the Kelly clamp, forcing the tissue apart.

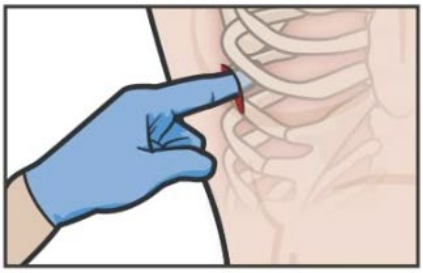


(f) With the jaws of the clamp holding the hole open, carefully insert a gloved finger through the incision and into the pleural space to verify position.



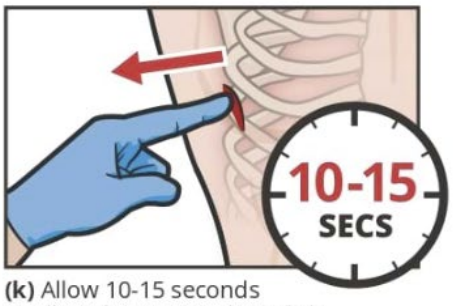
(g) Once the finger is in place, remove the clamp.

(h) Widen the pleural opening and ensure there are no adhesions.



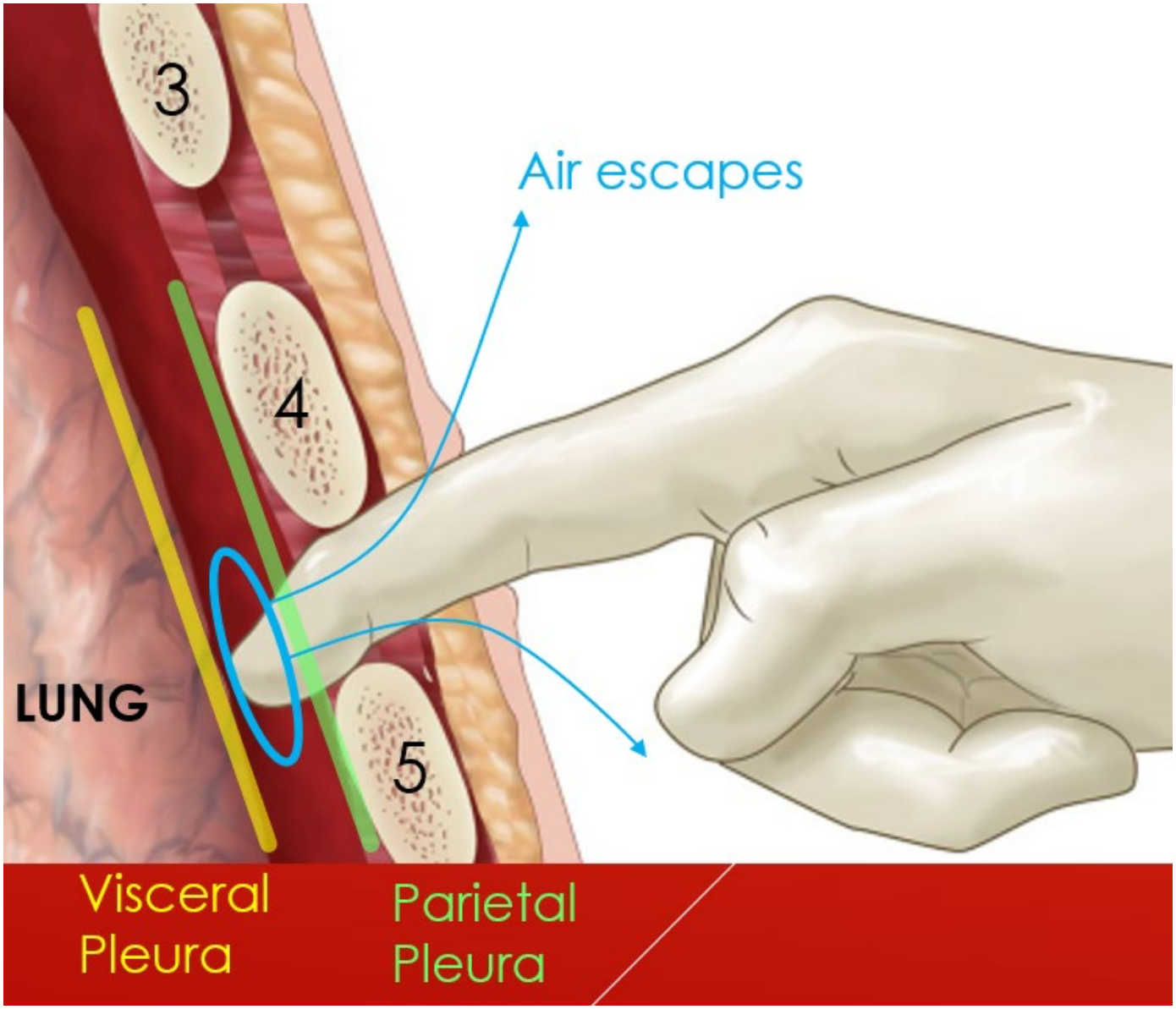
(i) Feel for lung tissue.

(j) Be sure there is air and the pink, spongy lung is immediately inside the chest. If not, you may be in the abdominal cavity.



(k) Allow 10-15 seconds to allow decompression of air in the chest cavity.

(l) Remove finger from chest



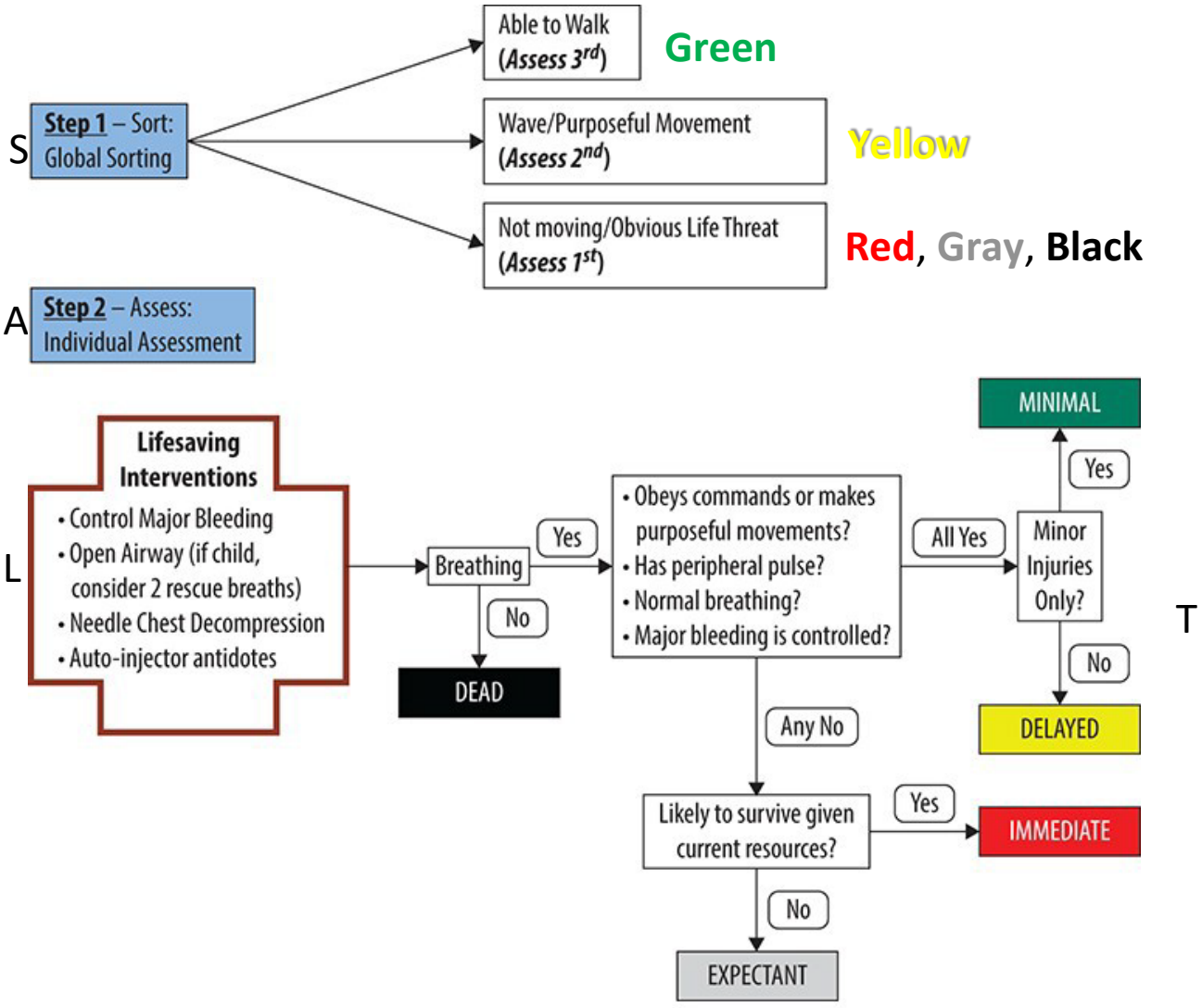
Finger thoracostomy procedure in traumatic cardiac arrest patients

TRAUMA TRIAGE PROTOCOL

FIELD TRIAGE

A. Mass Casualty Incidents (MCIs) are defined as those events that involve more patients and/or more severe injuries than a given Fire/EMS system can manage with the resources currently available.

B. During an MCI, additional resources/mutual aid should be called in by the first responding ambulance. As it may be some time before additional help arrives and a proper Incident Command System (ICS) can be established, the first unit on-scene should begin MCI Field Triage using the Sort, Assess, Life-Saving Interventions, Treatment/Transport (SALT) triage system:



Source: Derek R. Cooney: *Cooney's EMS Medicine*: www.accessemergencymedicine.com

C. During MCI Triage, emphasis must be placed on doing the greatest good for the greatest number of patients. Time and resources are limited, and thus maximal intervention on each individual patient will be impossible. Engage in secondary triage and frequent patient reassessment after the initial SALT triage of all patients is completed.

DEFINITIONS

A. As used in section 4765.01 of the Ohio Revised Code (ORC), chapter 4765-14 of Ohio Administrative Code (OAC) and in this protocol, "trauma" or "traumatic injury" means severe damage to or destruction of tissue that satisfies both of the following conditions:

1. It creates a significant risk of any of the following:
    a. Loss of life;
    b. Loss of limb;
    c. Significant, permanent disfigurement;
    d. Significant, permanent disability: and
2. It is caused by any of the following:
    a. Blunt or penetrating injury;
    b. Exposure to electromagnetic, chemical, or radioactive energy;
    c. Drowning, suffocation, or strangulation;
    d. A deficit or excess of heat.

D. "Trauma patient" or "trauma victim" means a person who has sustained a traumatic injury.

E. "Trauma care" means the assessment, diagnosis, transportation, treatment, or rehabilitation of a trauma victim by emergency medical service personnel or by a physician, nurse, physician assistant, respiratory therapist, physical therapist, chiropractor, occupational therapist, speech-language pathologist, audiologist, or psychologist licensed to practice as such in this state or another jurisdiction.

F. "Trauma center" means all of the following:

1. Any hospital that is verified by the American college of surgeons as an adult or pediatric trauma center;
2. Any hospital that is operating as an adult or pediatric trauma center under provisional status pursuant to section 3727.101 of the ORC;
3. Any hospital in another state that is licensed or designated under laws of that state as capable of providing specialized trauma care appropriate to the medical needs of the trauma patient.

G. "Evidence of poor perfusion" means physiologic indicators of hemorrhage or decreased cardiovascular function, which may include any of the following symptoms:

1. Weak, distal pulse;
2. Pallor;
3. Cyanosis;
4. Delayed capillary refill;
5. Tachycardia

H. "Evidence of respiratory distress or failure" means physiologic indicators of decreased ventilatory function, which may include any of the following symptoms:

1. Stridor;
2. Grunting;
3. Retractions;
4. Cyanosis;
5. Hoarseness;
6. Difficulty speaking.

I. “Evidence of hemorrhagic shock” means physiologic indicators of blood loss that may include any of the following symptoms:
    1. Delayed capillary refill;
    2. Cool, pale, diaphoretic skin;
    3. Decreased systolic blood pressure with narrowing pulse pressure;
    4. Altered level of consciousness.

J. “Seatbelt sign” means abdominal or thoracic contusions and abrasions resulting from the use of a seatbelt during a motor vehicle collision.

K. “Signs or symptoms of spinal cord injury: means physiologic indicators that the spinal cord is damaged, including, but not limited to, paralysis, weakness, numbness, or tingling of one or more extremities.

L. “Evidence of neurovascular compromise” means physiologic indicators of injury to blood vessels or nerves including, but not limited to, pallor, loss of palpable pulses, paralysis, paresthesias, or severe pain.

M. “Body region” means a portion of the trauma victim’s body divided into the following areas:
    1. Brain;
    2. Head, face, and neck;
    3. Chest;
    4. Abdomen and pelvis;
    5. Extremities;
    6. Spine.

N. “Evidence of traumatic brain injury” means signs of external trauma and physiologic indicators that the brain has suffered an injury caused by external forces including, but not limited to:
    1. Decrease in level of consciousness from the victim’s baseline;
    2. Unequal pupils;
    3. Blurred vision;
    4. Severe or persistent headache;
    5. Nausea or vomiting;
    6. Change in neurological status.

DETERMINATION OF A TRAUMA VICTIM
4765-14-02 of the OAC

Emergency medical services personnel shall use the criteria in this rule, consistent with their certification, to evaluate whether an injured person qualifies as an adult trauma victim, geriatric trauma victim, or pediatric trauma victim, in conjunction with the definition of trauma in section 4765.01 of the ORC and chapter 4765-14 of the OAC.

A. **An Adult trauma victim** is a person between the ages of sixteen and sixty-nine years of age inclusive exhibiting one or more of the following physiologic or anatomic conditions:
    1. Physiologic Conditions:
        a. Glasgow Coma Scale less than or equal to 13;
        b. Loss of consciousness more than five minutes;
        c. Deterioration in level of consciousness at the scene or during transport;
        d. Failure to localize pain;
        e. Respiratory rate less than 10 or greater than 29;

f. Requires endotracheal intubation;
g. Requires relief of tension pneumothorax;
h. Pulse rate greater than 120 in combination with evidence of hemorrhagic shock;
i. Systolic blood pressure less than 90, or absent radial pulse with carotid pulse present;

2. Anatomic Conditions (the same for all ages):
   a. Penetrating trauma to the head, neck, or torso;
   b. Significant penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;
   c. Injuries to the head, neck, or torso where the following physical findings are present:
   d. Visible crush injury;
   e. Abdominal tenderness, distention, or seatbelt sign;
   f. Pelvic fracture;
   g. Flail chest;

3. Injuries to the extremities where the following physical findings are present:
   a. Amputations proximal to the wrist or ankle;
   b. Visible crush injury;
   c. Fractures of two or more proximal long bones;
   d. Evidence of neurovascular compromise.
   e. Signs or symptoms of spinal cord injury;
   f. Second degree (partial thickness) or third degree (full thickness) burns greater than 10% total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway.

B. **A Pediatric trauma victim** is a person under sixteen years of age exhibiting one or more of the following physiologic or anatomic conditions:
   1. Physiologic Conditions:
      a. Glasgow Coma Scale less than or equal to 13;
      b. Loss of consciousness greater than 5 minutes;
      c. Deterioration in level of consciousness at the scene or during transport;
      d. Failure to localize pain;
      e. Evidence of poor perfusion or evidence of respiratory failure or distress.
   2. Anatomic Conditions – see A. 2. Anatomic Conditions listed for the Adult Trauma Victim.

C. **A Geriatric Trauma Victim** is a person 70 years of age or older exhibiting one or more of the following causes on injury or physiologic or anatomic conditions:
   1. Physiologic Conditions:
      a. Glasgow Coma Scale less than or equal to 14 in a trauma patient with a known or suspected traumatic brain injury;
      b. Glasgow Coma Scale less than or equal to 13;
      c. Loss of consciousness greater than 5 minutes;
      d. Deterioration in level of consciousness at the scene or during transport;
      e. Failure to localize pain;
      f. Respiratory rate less than 10 or greater than 29;
      g. Requires endotracheal intubation;
      h. Requires relief of tension pneumothorax;
      i. Pulse rate greater than 120 in combination with evidence of hemorrhagic shock;
      j. Systolic blood pressure less than 100, or absent radial pulse with carotid pulse present.

   2. Anatomic Conditions – see A. 2. Anatomic Conditions listed for the Adult Trauma Victim, plus the following:

a. Fracture of one proximal long bone sustained as a result of a motor vehicle crash;
b. Injury sustained in two or more body regions.

3. Cause of injury:
    a. Pedestrian struck by a motor vehicle;
    b. Fall from any height, including standing falls, with evidence of a traumatic brain injury.

D. Emergency medical service personnel shall also consider mechanism of injury and special considerations, as taught in the EMT training curriculum when evaluating whether an injured person qualifies as a trauma victim.

EXCEPTIONS TO MANDATORY TRANSPORT
4765-14-05 of the OAC

A. Emergency medical service personnel shall transport a trauma victim, as defined in section 4765.01 of the ORC, chapter 4765-14 of the OAC and this protocol, directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:
    1. It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center;
    2. It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time;
    3. Transport the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources;
    4. No appropriate adult or pediatric trauma center is able to receive and provide adult or pediatric trauma care to the trauma victim without undue delay;
    5. Before transport of a patient begins, the patient requests to be taken to a particular hospital that is not a trauma center or the patient is less than 18 years of age or is unable to communicate, such a request is made by an adult member of the patient's family or a legal representative of the patient.

If a trauma patient is not transported directly to an appropriate and qualified trauma center, you MUST document which of the above exceptions apply.