



Multiple Trauma

History

- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints/ protective equipment
- Past medical history
- Medications

Signs and Symptoms

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential (Life threatening)

- Uncontrolled hemorrhage
- Airway obstruction/ deformity
- Chest:
 - Tension pneumothorax
 - Flail chest/ Open chest wound
 - Pericardial tamponade/ Hemothorax
- Head Trauma Protocol TB 5
- Intra-abdominal bleeding
- Pelvis/ Femur/ Extremity fracture
- Spine fracture/ Cord injury
- Hypothermia

	Age Appropriate Airway Protocol(s) AR 1 - 7 as indicated
P	Chest Decompression Procedure WTP 1 if indicated
	Control External Hemorrhage Procedure(s) WTP 4, 5, 7 Consider Pelvic Binding Splint Fractures Procedure WTP 3
	IV or IO Access Protocol UP 6
	Spinal Motion Restriction Procedure WTP 2 Spinal Motion Restriction Protocol TB 8 if indicated
	Obtain and Record GCS

Tranexamic acid (TXA)/ Blood Product Indicators:
V/S parameters for blunt or penetrating trauma:

Adult:

- SBP \leq 70 mmHg
or
- SBP \leq 90 mmHg + HR \geq 110
- Age \geq 65
SBP < 100 mmHg + HR > 100

Peds:

- SBP < {70 + 2(Age)}

**** Visual evidence of large volume blood loss and/or Suspected solid organ injury with internal hemorrhage ****

VS / Perfusion Abnormal / Shock? YES

NO

	Head Injury Protocol TB 5 if indicated
	Altered Mental Status Protocol UP 4 if indicated
	Pain Control Protocol UP 11 if indicated
	Extremity Trauma Protocol TB 4 if indicated
	Crush Syndrome Protocol TB 3 if indicated
	Repeat Assessment Adult Procedure
	Monitor and Reassess

	Age Appropriate Hypotension/ Shock Protocol AM 5/ PM 3 if indicated
A	Tranexamic acid (TXA) 1 - 2 g IV / IO Peds: 15 mg/kg IV/IO over 10 minutes Maximum 1 gm if indicated
P	If Suspected Hemorrhagic Shock Low Titer O+ Whole Blood Administration Procedure WTP-9 Whole Blood 1 Unit (500 mL) IV / IO May repeat x1 if indicated Peds: Whole Blood 10 ml/kg IV / IO May repeat x1 if indicated Followed by 2 g Calcium Gluconate IV / IO If Calcium Gluconate unavailable: 1 g Calcium Chloride over 3-5 minutes

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan
Limit Scene Time \leq 15 minutes
Provide Early Notification

Notify Destination or Contact Medical Control



Multiple Trauma

TXA (Tranexamic Acid):

- 1) Indicated for ages 1 or greater in trauma patients with signs/symptoms of suspicion of internal hemorrhage and anticipation of blood transfusion.
- 2) Indication includes BP <100 systolic, HR > 110, altered LOC, pale, diaphoretic.
- 3) Contraindications include time greater than 3 hours from onset of injury, shock with other measures (tourniquet, direct pressure, and minimal fluid loss), nontraumatic shock, and non-hemorrhage shock. Additional contraindications evidence / hx of intravascular clotting (DVT, PE, stroke).
- 4) Patient must be transported to a trauma center if possible - pending weather conditions.
- 5) Loading dose TXA -Peds 15 mg/kg IV - Max 1 gram - Adults 1-2 grams slow push over 1 min

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Scene time should not be delayed for procedures and all should be performed during rapid transport of unstable patients.**
- **Ask all patients if they are taking any anticoagulants and report during facility transition of care.**
- **Airway:**
 - **BVM and BIAD are acceptable for airway management to maintain SpO₂ of 92 – 98%.**
 - **Endotracheal intubation, if performed, should be completed during transport and should not delay scene time.**
- **Breathing:**
 - **Consider Chest Decompression with signs of shock and/ or injury to torso with evidence of tension pneumothorax.**
- **Circulation:**
 - **Control external hemorrhage and prevent hypothermia by keeping patient warm.**
 - **IV or IO access should be established during rapid transport of unstable patients.**
- **Head Injury with multiple trauma (Refer to Head Trauma Protocol TB 5):**
 - **Higher SBP targets are needed to maintain cerebral perfusion pressure.**
 - **Single episodes of Hypotension and/ or hypoxia are associated with worse outcomes in head injured patients.**
 - **Adult SBP target is ≥ 100 mmHg.**
 - **Pediatric SPB target is $\geq 70 + 2(\text{Age})$ mmHg.**
- **Trauma Triad of Death:**
 - **Metabolic acidosis/ Coagulopathy/ Hypothermia**
 - **Address by appropriate resuscitation measures and keeping patient warm, regardless of ambient temperature, which helps to treat metabolic acidosis, coagulopathy, and hypothermia.**
- **Tranexamic Acid (TXA):**
 - **Agencies utilizing Tranexamic acid (TXA) must submit letters from the their receiving trauma centers for approval by the OEMS Medical Director.**
 - **Receiving trauma centers must agree to continue Tranexamic acid (TXA) therapy with repeat dosing.**
 - **Tranexamic acid (TXA) is NOT indicated and should NOT be administered where trauma occurred > 3 hours prior to EMS arrival.**
- **Trauma in Pregnancy:**
 - **Providing optimal care for the mother = optimal care for the fetus.**
 - **After 20 weeks gestation (fundus at or above umbilicus) transport patient on left side with 10 – 20° of elevation.**
- **Geriatric Trauma:**
 - **Age ≥ 65 : SBP < 110 mmHg or HR > SBP may indicate shock.**
 - **Evaluate with a high index of suspicion, occult injuries difficult to recognize and with unexpected patient decompensation.**
 - **Risk of death with trauma increases after age 55.**
 - **Low impact mechanisms, such as ground level falls might result in severe injury especially in age over 65.**
- **See Regional Trauma Guidelines when declaring Trauma Activation.**
- **Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.**
- **Refer to your Regional Trauma Guidelines when declaring Trauma Activation.**
- **Severe bleeding from an extremity, not rapidly controlled with direct pressure, needs application of a tourniquet.**
- **Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.**