



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

TXA/ Blood Product Indicators: V/S parameters for blunt or penetrating trauma:

Adult:

- SBP ≤ 90 mmHg
- Age ≥ 65
SBP < 100 mmHg + HR > 100

Peds:

- SBP $< \{70 + 2(\text{Age})\}$

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
P	TXA 2 g over 10 minutes IV / IO Peds: 20 mg/kg IV / IO over 10 minutes Maximum 2 gm if indicated
P	1 Unit Blood Product IV / IO Peds: 20 mL/kg IV / IO Pediatric Age and Weight Criteria: ≥ 3 years of age Or ≥ 15 kg O+/ O- Whole Blood or Packed RBCs if indicated

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

**Notify Destination or
Contact Medical Control**

IV / IO Fluid Resuscitation Volumes:

Adult:

Blunt trauma or Penetrating Trauma:

- 250 mL boluses to maintain SBP of ≥ 80 mmHg.

HEAD INJURY with Blunt or Penetrating trauma:

- 250 mL boluses to maintain SBP of ≥ 100 mmHg.

Peds:

- 20 mL/kg boluses to maintain SBP $< \{70 + 2(\text{Age})\}$
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TXA Guidelines for administration:

- Give with uncontrolled, non-compressible hemorrhage or hemorrhage that cannot be stopped with a tourniquet.
- Adults with non-compressible hemorrhage and BP < 90 mmHg
- Adult geriatric patients (≥ 65 years of age) with SBP < 100 mmHg and HR > 100 with uncontrolled, non-compressible hemorrhage.

Blood Products:

- Preferentially will have O- Whole Blood.
- During times of blood shortages:
 - We may have O+ Whole Blood.
 - We may have Packed Red Blood Cells (PRBC).
- O- or O+ may be given to men and women, as well as children who are ≥ 3 years of age and/ or ≥ 15 kg in weight.

IV / IO Resuscitation Volumes

- If blood products available and indicated, give 1 entire unit in adults or 20 mL/kg bolus in pediatrics.
- Do not titrate blood products to blood pressure, blood pressure parameters only indicated when giving NS or LR.

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 ≥ 70 + 2(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 TXA must submit letters from the their receiving trauma centers for approval by the OEMS Medical Director.**
 - **Receiving trauma centers must agree to continue TXA therapy with repeat dosing.**
 - **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.**