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

VS / Perfusion Abnormal / Shock?

YES → Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

APP — AAJT REBOA Procedure WTP 9 ***if indicated*** — APP

Advanced Resuscitation Care (ARC) Bundle

P — **ADULT: 1 Unit Whole Blood If s/s of Hemorrhagic Shock**
PEDIATRIC: 10 cc / kg Whole Blood If s/s of Hemorrhagic Shock

LifeFlow Plus Blood Infuser Procedure PAS – 14

A — **TXA 2 grams IV / IO Slow Push over 1 minute**
Pediatric: 15 mg / kg IV / IO Slow Push over 1 minute Max 2 grams
AND

P — **Calcium Gluconate 2 grams IV / IO over 2 - 3 minutes**
PEDIATRIC: 60 mg / kg IV / IO over 2 - 3 minutes MAX 2 grams

Allergic Reaction / Anaphylaxis Protocol AM 1 or PM 1 ***if indicated***

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

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

TXA Indications

BP < 90
OR
HR > 110
OR
Shock Index > 1

Advanced Resuscitation Care Bundle (ARC)
1. Whole Blood via rapid infuser
2. TXA
3. Calcium Gluconate

Blood is priority. Blood administered in 15 min or less increases survivability.

Multiple Trauma

BROSELOW GUIDE

Grey	Pink	Red	Purple	Yellow	White	Blue	Orange	Green	Black

Whole Blood Criteria

- BP < 70
  OR
- BP < 90 with HR > 110
  OR
- Witnessed traumatic arrest < 10 min prior to provider arrival and continuous CPR throughout downtime
  OR
- Age > 65 and SBP < 100 **AND** HR > 100 beats per minute
  OR
- Shock Index Criteria > 1
  OR
- Paramedic discretion

- Shock Index (SI) is a bedside assessment defined as heart rate (HR) divided by systolic blood pressure (SBP)
  SI = HR/SBP

Monitor for TACO/transfusion reaction/symptoms. If reaction occurs, go to Allergic Reaction/Anaphylaxis Protocol AM 1 or PM 1.

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.**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- **Scene times should not be delayed for procedures. These should be performed enroute when possible. Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Control external hemorrhage and prevent hypothermia by keeping patient warm.**
- **Consider chest decompression with signs of shock and injury to torso and evidence of tension pneumothorax.**
- **Trauma Triad of Death:**
  Metabolic acidosis / Coagulopathy / Hypothermia
  Appropriate resuscitation measures and keeping patient warm regardless of ambient temperature helps to mitigate metabolic acidosis, coagulopathy, and hypothermia.
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained ≥ 90%**
- **Tranexamic Acid (TXA):**
- **2 grams slow IVP over 1 minute. When TXA is administered calcium gluconate will also be administered, even in the absence of whole blood.**
  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.
- **Pediatric Trauma:**
  Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.
- **Geriatric Trauma:**
  Evaluate with a high index of suspicion.
  Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning.
  Risk of death with trauma increases after age 55.
  SBP < 110 may represent shock / poor perfusion in patients over age 65.
  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.
- Severe bleeding from an extremity not rapidly controlled with direct pressure may necessitate the application of a tourniquet.
- Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.