### Multi-System Trauma

**History**
- Time of injury
- Mechanism (blunt vs. penetrating)
- Damage to structure or vehicle
- Location of patient in structure or vehicle
- Restraints or protective equipment use
- Past medical history
- Medications

**Signs and Symptoms**
- Evidence of trauma
- Pain, swelling, deformity, lesions, or bleeding
- AMS
- Unconscious
- Respiratory distress or failure
- Hypotension or shock
- Arrest

**Differential**
- Chest:
  - Tension pneumothorax
  - Flail chest
  - Pericardial tamponade
  - Open chest wound
  - Hemothorax
- Intra-abdominal bleeding
- Pelvis or femur fracture
- Spinal injury
- Head injury
- Hypothermia

### Early transport

- Limit scene time to 10 minutes
- Control hemorrhaging
- Apply tourniquet for uncontrolled hemorrhage

- If wound is in a critical vascular area not accessible for a tourniquet,
  - Wound packing with hemostatic gauze
  - Secure airway and support respiratory rate
- Spinal Motion Restriction
  - If indicated
  - Place splints and cold packs to stabilize fractures as necessary

- Consider,
  - Needle decompression
  - For open wounds to chest/abdomen, apply occlusive dressing

- Establish IV/IO
- Cardiac monitor
- EtCO₂ monitoring

- If SBP < 80 in adults
  - Normal Saline bolus 500ml IV/IO
  - May repeat as long as criteria above exists
  - Maximum 1L
  - If poor perfusion or shock in peds
    - Normal Saline bolus IV/IO
    - Use pediatric tape and refer to dosing guide
  - Repeat to age dependent goal SBP
  - May repeat as long as criteria above exists

- Tourniquet use should not be delayed until a patient is in shock or is clearly exsanguinating. It should be applied early and can be used safely without risk of patient injury. Do not wait; apply often and tighten if needed.

- Notify receiving facility.
- Contact Base Hospital for medical direction
Pearls

- Prevention and reversal of hypothermia associated with shock from severe traumatic injury is critical. Apply blankets early and consider activation of heater in the patient compartment of the ambulance.
- ALS procedures in the field do not significantly improve patient outcome in critical trauma patients.
- Basic airway management is preferred unless unable to effectively manage with BLS maneuvers. Utilize modified jaw thrust technique to open the airway.
- Intubation of head injury patients is best addressed at the hospital.
- Hypotension is age dependent and is not always a reliable sign. It should be interpreted in context with the patient’s typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.
  - Neonate: < 60mmHg or weak pulses
  - Infant: < 70mmHg or weak pulses
  - 1-10 years: < 70mmHg + (age in years x2)
  - Over 10 years: <80mmHg
  - Over 65 years: <110mmHg
- Stabilize flail segments with bulky dressing.
- Cover eviscerated bowel with dry sterile dressing.
- Stabilize impaled object(s) with bulky dressing. Do not remove.
- Avoid hyperventilation. Maintain an EtCO2 of 35 or greater, which may be unreliable if the patient was subject to multisystem trauma or poor perfusion.
- An important item to monitor and document is a change in the level of consciousness by repeat examination.
- Do not overlook the possibility of associated domestic violence or abuse.