### 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

<table>
<thead>
<tr>
<th>Control hemorrhaging</th>
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<tr>
<td>Apply tourniquet for hemorrhage</td>
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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

### Treatment Protocol

**Notify receiving facility.** Contact Base Hospital for medical direction.

- **Spinal Motion Restriction if indicated**
- **Secure airway and support respiratory rate**
- Place splints and cold packs to stabilize fractures as necessary

**Respiratory Arrest/Failure**

- 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 pediatrics
- 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

For adults, consider Ondansetron

For pediatrics patients ≥ 4 years, consider Ondansetron
- Use pediatric tape and refer to dosing guide

In the absence of head trauma, age-specific hypotension, poor perfusion or AMS
- Consider Fentanyl for pain control

**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.**

**Suspected head injury?**

- Yes
  - **Trauma – Head Trauma**
  - 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.

- No
  - **Notify receiving facility. Contact Base Hospital for medical direction**
Pearls

- 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.