TRAUMATIC INJURIES

INCLUSION Criteria: Patients with suspected traumatic injuries

EXCLUSION Criteria: Patients in traumatic Cardiac Arrest

OTHER GUIDELINES TO CONSIDER: Airway Management, Altered Mental Status, Cardiac Arrest, Difficulty Breathing, Hemorrhage Control, Hypotension or Shock, Pain Management

- Universal Care – Trauma Management
- Perform Primary Survey
  - Circulation:
    - Control external hemorrhage
      - Hemorrhage Control
      - See Hypotension or Shock
  - Airway:
    - Assess for patency and open the airway as indicated
    - Consider Spinal Motion Restriction
    - Airway Management
  - Breathing:
    - Titrate Oxygen to lowest level to maintain Pulse Oximetry at 93% or greater
    - If respirations ineffective, support ventilation with Bag Valve Mask (BVM) Ventilation
    - Cover open chest wounds with occlusive dressing and secure on 3 sides
  - Disability:
    - Evaluate baseline neurological function; ability to follow commands
    - Evaluate patient responsiveness: Glasgow Coma Scale, AVPU
  - Expose:
    - Rapid Trauma Survey and evaluation of entire body, including the back
    - Keep patient warm; prevent hypothermia
- Perform Secondary Survey
  - Splinting of extremity injuries as indicated
  - Follow specific injury management guidelines as detailed in diagram
- Taser –Conducted Electrical Weapon (CEW)
  - Consider removal of the CEW at the request of Law Enforcement, provided removal from location of dart puncture zone is not contraindicated, see Taser –Conducted Electrical Weapon (CEW)
- Consider Destination Determination for trauma
- Consider Cardiac Monitoring
- Consider Waveform Capnography

- Consider IV/IO Access
  - 2 large bore sites preferred if major trauma
  - Administer Fluid Bolus – IV/IO in cases of trauma with suspected significant hemorrhage and a systolic blood pressure (SBP) less than 90 mmHg (or below the age-appropriate lower limit of normal), or when signs or symptoms of shock are present; see Hypotension or Shock

- For persistent hypotension or signs of shock not responding to fluid resuscitation, see Hypotension or Shock

- Traumatic hemorrhage – in patients > 18 years old with major trauma and clinical evidence of marked blood loss, internal or external, AND injury occurred < 3 hours prior AND HR > 110 or SBP < 90 mmHg consider, if available, Tranexamic Acid (TXA)

NOTES
**HEAD & NECK INJURIES**
- **Spinal Motion Restriction** as indicated
- Prevent further neurologic injury
  - Support oxygenation & ventilation
    - Avoid Hypoxemia
    - Maintain SpO2 93% - 98%
    - Avoid hyperventilation
    - Maintain ETCO2 35 – 45 mmHg
  - Nasal airways are contraindicated in patients with significant facial trauma
- If unable to follow commands, prevent hypotension - **IV/IO Fluid Bolus** 20 mL/kg (all ages) to maintain SBP at:
  - Age ≥ 15 years: 110 mmHg
  - Age < 15 years: Age appropriate
- Elevate head of bed 30° (head injury) while maintaining alignment of neck/torso unless hypotensive
- If intracranial pressure (SBP > 200 mmHg, bradycardia, abnormal respiratory pattern, unresponsive, and/or pupillary changes) to maintain SBP at:
  - Age ≥ 15 years: 110 mmHg
  - Age < 15 years: Age appropriate
- Consider **Pain Management**
  - Consider **Sedation** or **Pain Management**
  - If unable to maintain SpO2 > 90% with supplemental O2 and BVM Ventilations, consider **Medication Assisted Airway Management (MAAM)**

**Avoid the “H-Bombs” of Traumatic Brain Injury**
- Hypoxia
- Hypotension
- Hypoglycemia
- Hyperventilation

**Basilar Skull Fracture**
- Monitor for periorbital ecchymosis (Raccoon Eyes), bruisings over the mastoid process (Battle Sign) and/or bloody or clear (CSF) drainage from nose and/or ears
  - If CSF drainage present from nose or ear, apply a 4X4 to collect drainage. Do Not attempt to stop drainage and do NOT place anything into nose or ear.

**ABDOMINAL/PELVIC INJURIES**
- Stabilize impaled foreign bodies
- Evisceration – cover with saline moistened gauze
- **Pelvic Binder** as indicated for unstable pelvis and **Hypotension or Shock**
- **CHEST INJURIES**
  - Stabilize impaled foreign bodies
  - If evidence of open OR sucking chest wound, apply occlusive dressing or chest seal
  - Initiate **Cardiac Monitoring**
  - If evidence of tension pneumothorax (breath sounds (unilateral), hypotension, tachycardia, hypoxia, respiratory distress, JVD, tracheal deviation) perform **Needle Decompression**

**CHEST INJURIES**
- Control bleeding per **Hemorrhage Control**, or **Tourniquet-Intentional** if severe, uncontrolled bleeding
- **Splinting** as indicated with consideration for realigning angulated fractures when appropriate and repeat assessment of distal neurovascular exam after splinting
- Apply sterile dressing over open fractures
- **Partial Amputation**
  - Splint partial amputated parts in anatomic position, if possible
  - Apply moist sterile dressing over injury
- **Complete Amputation**
  - Cover stump with moist sterile dressing
  - Cover amputated part with moist, sterile dressing and store in sealed, plastic bag on ice
  - Transport amputated part with patient

**PROLONDED CRUSH INJURIES**
- Do NOT tourniquet extremity to prevent release of toxins
- Support airway and breathing; crush injuries to the chest are a significant source of respiratory failure and death
- Support oxygenation & ventilation
  - **Oxygen** to maintain SpO2 93% - 98%
  - **BVM Ventilations**, as needed to maintain ETCO2 35 – 45 mmHg
  - Consider **Airway Management**
- Initiate **Cardiac Monitoring**
- Initiate **IV/IO Access** whenever possible prior to extrication
  - **IV/IO Fluid Bolus** 0.9% NS at 1000 mL/hour for 2 hours; start during extrication or as soon as possible after extrication
- Upon release of trapped extremity:
  - Monitor ECG for signs of hyperkalemia (peaked T-waves, widened QRS)
  - If evidence of hyperkalemia, see **Hyperkalemia** guideline

**EYE INJURIES**
- **Chemical Splash/Burn**
  - Thoroughly and continuously irrigate affected eye(s) using copious amounts of saline instilled through IV tubing or any other means
  - Initiate **Cardiac Monitoring**
  - Consider **Nitrous Oxide** for pain control if no evidence of penetrating injury
- **Penetrating Injury/Ruptured Globe**
  - Observe for signs of penetration: peaked pupil, excessive edema of conjunctiva, subconjunctival hemorrhage, blood in anterior chamber (hyphemia) or foreign body/impaled object
  - Do NOT remove impaled objects
  - Do NOT irrigate eye
  - Avoid all pressure on injured eye
  - May patch injured eye or both eyes based on patient tolerance
  - Elevate head of bed 45°
- Administer anti-emetic medications per **Nausea or Vomiting** guideline, even if not nauseated
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