TRAUMA MANAGEMENT

BASIC EMT

1. Airway: Trauma patient's and pediatric patient's airway should be maintained by BLS means if possible.
    - ➢ Evaluate the airway. Take into account the possibility of cervical injury. Secure the airway by positioning, oropharyngeal airway, or nasopharyngeal airway if possible.
    - ➢ Place supraglottic airway if necessary.
    - ➢ Provide continuous waveform ETCO2 (if available)

2. Consider cervical spine stabilization

    These patients generally require immobilization with a cervical collar:

    a. High risk injury (high speed MVC, axial loading injury)
    b. Focal neurological deficits such as paralysis
    c. Intoxication or altered mental status
    d. Age > 65
    e. Presence of midline bony tenderness of the spine
    f. Midline spinal pain with movement of the neck

*Patients **without any of the above** findings may be transported without a cervical collar.*

Extrication devices: Use the long spine board, scoop stretcher, vacuum mattress, short board, or Kendrick Extrication Device (KED) only as needed to minimize movement of the patient when moving them from the point of injury to the stretcher. This may be removed as needed prior to transport unless it is necessary for patient safety.

Altered mental status: A multi system blunt trauma patient, such as from a high velocity crash or significant fall, who is unable to follow commands due to combativeness, intoxication, or decreased mental status, should remain on the backboard, scoop, or vacuum mattress for their safety until handoff to the ED.

Alert and cooperative: Patients with normal mental status can participate in their movement to the cot with specific instructions to limit neck movement and stop if any movement increases any neck pain.

Penetrating trauma: These patients do not need cervical collars.

TRAUMA MANAGEMENT cont.

Airway concerns: Techniques to stabilize the spine should not supersede airway concerns particularly in the case of excessive bleeding or difficulty with visualization.

3. Breathing
   - ➢ Assist with high flow oxygen.
4. Circulation
   - ➢ Control severe bleeding per BLS standards.
     - Direct Pressure
     - Tourniquet for extremity bleeding
     - Wound packing for significant external bleeding where tourniquet cannot be used or is ineffective utilizing gauze or hemostatic agents (preferred if available)
5. Scene time should be limited to 10 minutes or less when possible.
6. Prevent hypothermia.
7. Contact Medical Control early

ADVANCED EMT

8. Establish two (2) large bore IV's.
   a. Consider saline lock(s)
   - ➢ IV's will not delay transport.
9. If BP < 90, Normal Saline titrated to keep systolic blood pressure 90-100

PARAMEDIC

10. Consider intubating patients who are unable to be adequately oxygenated by BLS means. Endotracheal intubation should not significantly delay transport. If an endotracheal tube (ETT) is not passed after a total of two attempts at visualization and/or ETT passage, a non-visualized airway should be placed. "Attempt" is defined by the National Association of EMS Physicians as: "Insertion of laryngoscope blade into mouth (for orotracheal methods)".
    - ➢ EMS personnel are required to confirm endotracheal tube placement on every intubation with:
      a. visualization
      b. 5-point auscultation
      c. chest rise
      d. continuous waveform $ETCO_2$
    - ➢ Post Intubation treatment, consider sedation and/or pain management:

    Sedation:
    Midazolam (Versed) Up to 5 mg IV, IO, IN, or IM may repeat to a total dose of 10 mg. *Contraindicated with hypotension*.

OR

TRAUMA MANAGEMENT cont.

Ketamine (Ketalar) 300 mg IM, however, if IV is established, administer 1 mg/kg IV / IO. May repeat IV dose once.

Pain Management:
Fentanyl (Sublimaze) *****First choice for hemodynamic instability, extremes of age*

Adult Patients

- 1 mcg/kg IV/IO/IM/IN slowly every 5 minutes (not to exceed 100 mcg per unit dose) a maximum total dose of 200 mcg

Hydromorphone (Dilaudid) **Appropriate when longer duration of effect desired

Adult Patients

- 0.5 – 1.0 mg IV/IO/IM every 10 min to max of 2mg

Geriatric Patients (greater than 65 years)

- 0.5mg IV/IM every 10 min to max of 1 mg

Both **Dilaudid** and **Fentanyl** can be administered slow IV or IM, however, **the patient will receive only one of the two drugs by standing order.**

- PEEP valves may be used at 5 cm H_2O, if available, but may be contraindicated in hypotension.
- Tidal volume 5 – 8 ml/kg of ideal body weight and rate 8 – 12 breaths / minute with spontaneous circulation. Titrate to keep end tidal CO_2 35-45.
- Tidal volume 500 – 600 ml and rate 8 – 10 with cardiac arrest.
- Consider placing cervical collar after the airway is secured to reduce the risk of extubation.

11. When all reasonable attempts to provide an adequate airway by less invasive means have failed, consider performing an invasive airway procedure:

Surgical Cricothyrotomy (age greater than or equal to 5 years)

1. Make a vertical, midline incision through the skin over the cricothyroid membrane
2. Carefully incise through the cricothyroid membrane.
3. Spread tracheal incision with scalpel handle.
4. Assess and maintain opening with finger or other device.
   a. Consider ET introducer (bougie)
5. Insert tube through the incision and advance caudally (toward the feet).
6. Secure tube and dress incision site with 4x4's.
7. Continue to ventilate the patient via bag-valve-mask during the procedure if able.

TRAUMA MANAGEMENT cont.

8. Reassess airway and ventilatory status frequently.
9. CONFIRM TUBE PLACEMENT
   - ➢ EMS personnel are required to confirm cricothyrotomy tube placement on every surgical airway:
     a. 5-point auscultation
     b. chest rise
     c. continuous waveform $ETCO_2$.

Needle Cricothyrotomy (age less than 5 years)

1. Locate the Cricothyroid membrane.
2. Puncture cricothyroid membrane with a catheter over the needle and saline filled syringe. Direct the needle toward the feet and aspirate for air. Once in the trachea advance the catheter.
3. Attach a 3.0 mm endotracheal adapter to the catheter and ventilate.

12. If significant trauma, SBP < 90, less than 3 hours since injury, and/or heart rate > 110:
    a. **Tranexamic Acid (TXA)**
    - ➢ 1 gram in 100 ml NS over 10 minutes IV / IO
13. If traumatic arrest
    a. Resuscitate - if any of the following signs of life are present:
       • EMS witnessed arrest
       • Any Electrocardiographic Activity
       • Any spontaneous respirations
       • Movement
       • Pupillary reaction
       • Electrocution or Lightning Strikes
    b. When trauma insufficient to explain cardiac arrest, refer to CCR/ACLS Protocol.
    c. Consider needle chest decompression bilaterally if known or suspected chest injury
    d. Contact medical control after 15 minutes of resuscitation efforts to discuss the need to continue active resuscitation efforts when on scene. However, if already enroute and further efforts are felt to be futile, consider transporting quietly to the hospital without active resuscitation efforts after contacting OLMC during transport.

AEROMEDICAL TRANSPORT

Possible indications for an air ambulance include but are not limited to

- ➢ Patients triaged directly to a trauma center
- ➢ Extended scene time (entrapment and/or extrication)
- ➢ Critical burns
- ➢ Multiple critical victims
- ➢ Road conditions inhibiting rapid ground transportation

In general, when response time to the scene by an air ambulance exceeds the transport time to a hospital by ground transport, the patient should be transported by ground.