

OhioHealth Emergency Medical Services Podcast Series

July 2020 Episode: The First Five Minutes of the EMS Trauma Assessment

Objectives:

1. Review the unique characteristics of trauma emergencies.
2. Review the importance of efficient trauma scene management and describe strategies for expediting time to definitive care.
3. Describe strategies for prehospital external hemorrhage control.
4. Review strategies for traumatic airway management
5. Review assessment and management of tension pneumothorax, hemothorax and pericardial tamponade
6. Describe the limitations of fluid resuscitation in the setting of hemorrhagic shock.
7. Review strategies for preventing secondary injury in traumatic brain injury.

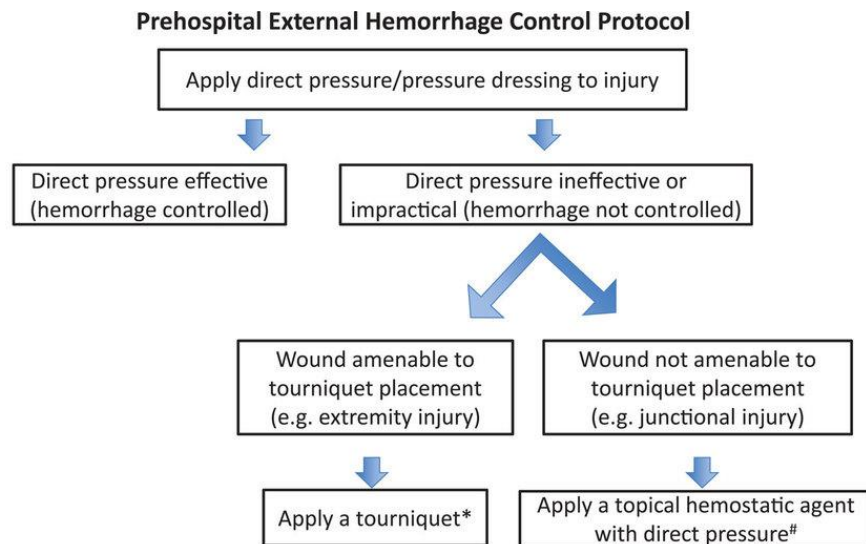
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Session 1

- Case Presentation
- 25 YM found unresponsive in driver's seat after an MVC
- Trauma Emergencies
 - Time to definitive care is important
 - Critical trauma patients need an operating room quickly
 - Maintain a load-and-go rather than stay-and-play mindset
 - Dichotomizing traumatic mechanisms is helpful with assessment, management and prognostication
 - Penetrating Trauma
 - Blunt Trauma
- The Prehospital Primary Survey
 - Scene Management and Limiting On-Scene Times
 - Prolonged scene times associated with increased trauma mortality
 - Treat like a "warm zone"
 - Reposition and reopen airway
 - Perform needle decompression for suspected tension pneumothorax
 - Stop external hemorrhage through direct pressure or tourniquet application
 - Perform all other procedures and interventions in route to hospital

- External Hemorrhage Control
 - Try direct pressure/pressure dressings first
 - Utilize tourniquet for extremity bleeding uncontrolled with direct pressure
 - Junctional hemorrhage is challenging
 - Consider pressure dressing, wound packing, and applying knee to groin or axilla



Eileen M. Bulger, David Snyder, Karen Schoelles, Cathy Gotschall, Drew Dawson, Eddy Lang, Nels D. Sanddal, Frank K. Butler, Mary Fallat, Peter Taillac, Lynn White, Jeffrey P. Salomone, William Seifarth, Michael J. Betzner, Jay Johannigman & Norman McSwain Jr. (2014) An Evidence-based Prehospital Guideline for External Hemorrhage Control: American College of Surgeons Committee on Trauma, Prehospital Emergency Care, 18:2, 163-173. DOI: [10.3109/10903127.2014.896962](https://doi.org/10.3109/10903127.2014.896962)

- Airway and Breathing
 - Consider spinal motion restriction before manipulating airway
 - Assess and assure airway patency
 - Assess and assure adequate oxygenation and ventilation
 - Evaluate for tension pneumothorax
 - Unilateral absent breath sounds
 - Tracheal deviation
 - Distended neck veins
 - Hemodynamic instability
 - Perform needle decompression for tension pneumothorax
 - Maintain a low threshold for performing this procedure
 - Traditional location: 2nd intercostal space at mid-clavicular line
 - Newer location: 4th/5th intercostal space at the anterior axillary line
 - Thinner chest wall
 - Lower rate of failure

Needle Thoracostomy Failure

Location	Chest Wall Thickness (cm)	Failure Rate with 5 cm Angiocatheter
2 nd ICS - MCL	4.3 (3.9 - 4.7)	38% (24 - 54%)
4 th /5 th ICS - MAL	4.0 (2.9 - 5.1)	31% (10 - 64%)
4 th /5 th ICS - AAL	3.4 (2.8 - 4.0)	13% (8 - 22%)

2nd ICS - MCL = 2nd Intercostal Space - Mid-Clavicular Line
4th/5th ICS - MAL = 4th/5th Intercostal Space - Mid-Axillary Line
4th/5th ICS - AAL = 4th/5th Intercostal Space - Anterior-Axillary Line

<https://rebelem.com/what-is-the-best-anatomic-location-for-needle-thoracostomy/>

Session 2

- Circulation
 - Traumatic injuries may cause shock
 - Initial vital signs may be normal
 - Looks for evidence of poor perfusion
 - Look for external signs of internal trauma
 - Extremes of age and other medical problems may alter presentation of shock
 - **Hemorrhagic shock: most common**
 - Obstructive shock
 - Pericardial tamponade
 - Tension pneumothorax
 - Cardiogenic shock
 - Blunt cardiac injuries
 - Neurogenic shock
 - Spinal injury that injures autonomic nervous system
 - Hypotension + Bradycardia
 - Septic Shock
 - Less common
 - Prolonged downtimes
 - Blood has 3 basic components
 - Cells (Red Blood Cells and Platelets)
 - Coagulation Proteins
 - Fluid
 - Optimal resuscitation of hemorrhagic shock is with blood products
 - The goal of prehospital hemorrhagic shock resuscitation is to **maintain perfusion utilizing the principle of permissive hypotension**
 - **Avoid the lethal triad of trauma resuscitation** by only giving enough intravenous fluid to maintain perfusion
 - Acidosis
 - Hypothermia
 - Coagulopathy
- Disability
 - Assess disability with the following:
 - GCS (motor component is most important)
 - Unequal pupils
 - Lateralizing deficits
 - Hypoxia and hypotension are associated with increased mortality with traumatic brain injuries
 - Avoid the 3 Bad H's of Traumatic Brain Injury
 - Hypoxia
 - Hypotension
 - Hyperventilation

- Video laryngoscopy may be helpful with challenging traumatic airways
 - Supraglottic airways may be used as a primary airway device but recognize limitations
- Tranexamic acid (TXA) supplements other blood products in trauma resuscitation
 - Overall evidence for prehospital use is indeterminate
 - Utilization in coordination with trauma centers is advised
 - The thromboelastogram (TEG) may be used by trauma centers to help guide blood product administration
- Case Resolution
 - Scene time limited
 - Providing life-saving stabilization in route to the hospital
 - Expedited definitive care in the operating room