EMS Subspecialty Certification Review Course

1.2 INJURY

1.2.1 Trauma

Version: 2017

Trauma Systems Question
What do the CDC Trauma Triage guidelines aid a prehospital provider in deciding?

A. Right patient  
B. Right facility  
C. Right diagnosis  
D. A and B

Learning Objectives
Upon the completion of this program participants will be able to:

• Review and detail important historic milestones in the evolution of prehospital trauma care.
• Describe the role of EMS in the modern trauma care system.
• Discuss Trauma Center designation versus verification
Learning Objectives

Upon the completion of this program participants will be able to:
• Discuss the prehospital approach to and care of the injured patient.
• Discuss transport mode and destination decision challenges
• Discuss the role of data collection and medical control in trauma systems

History

• Experience and surgical care practices in the Vietnam War were applied to EMS:
  • Concept of initial trauma care near the front lines soon after injury
  • Tourniquets
  • IV fluids
  • Rapid evacuation to initial stabilizing surgery and later to definitive surgery
  • Field analgesia


History

• The primary initial goal of modern EMS was to improve trauma care in the United States
• 1966 National Academy of Sciences document Accidental Death and Disability: The Neglected Disease of Modern Society was a major impetus for modern EMS system development.
History

• 1971: First trauma center designation
• 1976: Optimal Resources for the Care of the Seriously Injured published by the American College of Surgeons
• 1985: National Academy of Sciences revisits the "White Paper" of 1966 noting continuing weaknesses in trauma care
• 1980s: Standardized Courses for prehospital trauma care

History

• The last two decades have been a period of review and transition to evidence-based practice:
  – Airway management
  – MAST/PASG
  – Golden hour/period
  – IV fluids
  – Scene times
  – Helicopter usage
  – Futility of certain types of trauma (e.g., blunt trauma)
  – Prehospital analgesia

Trauma System Organization

• States organize trauma “systems”, and often delegate “designation” to a state agency
• Designation v Verification
  – Designation: permission given to advertise as a trauma center
  – Verification: unbiased outside assessment of a hospital’s trauma care
• Trauma system design should be based on NEED
  – Expected volume of patients, population size served, proximity to other trauma centers, etc
Trauma Center Designation

- Promulgated by ACS-COT criteria
  - Level 3 = ER + immediately available surgeon + ortho/plastics/anesthesia/radiology on call
  - Level 2 = Level 3 requirements + neurosurg/OB/ophtalmology/hand/maxillofacial/thoracic/critical care
  - Level 1 = Level 2 + coronary bypass capable/microvascular + OR staff in house + teach ATLS + serve as regional referral center + residents + research
- Level 4 = small community hospital with specialized training to stabilize and transfer trauma patients

Prehospital Trauma Care

- “Right patient, Right facility, Right time”
- Field triage: 2006 and 2011 CDC released their field triage guidelines modeled after the ACS-COT guidelines
- EMS uses field triage to evaluate a patient for injuries (right patient) that require the expertise of a trauma center (right facility)
- Right time: making on the spot decisions about how best to get the patient to the trauma center (hint: air is not always faster)

Prehospital Trauma Care

- Differing priorities:
  - Determination of diagnosis not necessary
  - Initially, there may be very limited manpower and equipment requiring the provider to “think outside the box.”
  - Limited prehospital resources require proper prioritization (e.g., skipping splinting, rapid assessment)
  - Airway management does not always require intubation
  - Much of prehospital care can be provided enroute
Prehospital Trauma Care

- **Medical Control**
  - On Line v Off Line
    - Off line is preferred, avoids unnecessary delays in care
    - Recommended trauma surgeons in a system have input into protocols

- **Data**
  - NTDB (National Trauma Data Bank)
  - Tracking important outcomes/injury patterns
    - Undertriage rates (< 5% goal of high performing system)
    - Policy development based on data/outcomes
  - Research

Prehospital Trauma Care

- **Scene oversight (Incident Management):**
  - Bring order to chaos
  - Oversee:
    - Scene safety and patient access
    - Disentanglement
    - Assessment
    - Care
    - Extrication
    - Transport

Prehospital Trauma Care

- **Primary Assessment:**
  - Addresses immediate life-threats
    - Patient impression
    - Determine need for spinal precautions
    - Evaluating and securing the airway
    - Breathing
    - Circulation
    - Prioritization for patient transport

**Prehospital Trauma Care**

**Mechanism of injury (MOI) assessment:**
- MOI assessment is important, but not definitive
- Can help to predict injuries that may not have developed to a point where physical exam findings can be seen
- Helps to predict energy exchange
- Crumple zones, air bags, air currents, seat and shoulder harnessed can attenuate some injuries

**Secondary Assessment:**
- Assesses potential life threats
  - Stable patients: focused assessment
  - Unstable or Potentially Unstable patients:
    - Rapid trauma assessment.
    - Emphasis on GCS

**Reassessment:**
- Periodic reassessments allow trending of patient vital signs, GCS, and other essential parameters
- Performed every 15 minutes for Stable patients
- Performed every 5 minutes for Unstable or Potentially Unstable patients
Prehospital Trauma Care

- Transport mode/destination:
  - Mode (air versus ground)
  - Facility (e.g., trauma center, community ED)
  - Ingress/egress concerns
  - Priorities may change with disasters
  - Treat and release

Specific Patient Populations

- Blunt Trauma Care
  - Numerous “Constellations” of blunt trauma
- Blunt Trauma in Pregnancy
- Pediatric Trauma

Public Health and Trauma

- Trauma is largely a preventable disease
- Community-based prevention programs
  - Helmet programs
  - Pool safety
  - Car seats
Trauma Systems Question

What do the CDC Trauma Triage guidelines aid a prehospital provider in deciding?

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Take-Home Points

• Prehospital trauma care goals may differ from in-hospital trauma care
• Right Patient, Right Facility, Right Time
• Overall, trauma care is a continuum that begins with the event and transitions through recovery
• Goal is detection of injuries, rapid provision of care, and transport to an appropriate facility