Categorization of
Multiple Victims

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I have nothing to disclose
Objectives

• Is a trauma team needed?

• Categorization of injured children
  – Composition and roles of the trauma team
  – When does the trauma team need to be activated?
Is a Trauma Team Needed?
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**Adults:**
- Improves efficiency
- Decreases errors
- Limited data to suggest improved outcomes
Is a Pediatric Trauma Team Needed?

Vernon DD. Pediatrics 1999; 103:20-4

• Case Control Study
• ↓ time to CT scan: 27 vs. 21 minutes
• ↓ time to the OR: 63 vs. 625 minutes
• ↓ time in the ED: 85 vs. 821 minutes
• No difference in outcomes
  – Trend to ↑ survival in most severely injured
• Conclusion: Trauma team improves patient times
Trauma Team Composition

- Composition may vary based on the severity of the prehospital report
- Each person should have a defined role
- Eliminate unnecessary personnel/observers
Roles for the Trauma Team

- Team leader
- Airway management
- Primary/Secondary survey
- IV access/blood pressure - RN
- Remove clothes – tech/trainee
- Scribe/document - RN

1 – 3 MDs
Trauma Team Composition

- Emergency Medicine MDs
- Surgery MDs
- Nurses
- Ancillary personnel
Trauma Team Composition

• Ancillary personnel
  – Radiology technician with portable x-ray
  – Respiratory therapy with ventilator
  – ED technician: removes clothes/gets objects
  – Pharmacist
  – Ultrasonographer with ultrasound
  – Other MDs:
    • (Anesthesiology MD: airway???)
    • Orthopedic/Neurosurgeon
Most Important Aspect Impacting ED Care of Injured Children
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Preparation/Training
Categorization of Injured Patients: Secondary Trauma Triage

• “Trauma Team Activation”
• Patients triaged based on prehospital report and/or findings at initial ED triage
• Attempts to match appropriate personnel for degree of injury
• Upgrade response if necessary
• Recommend:
  – Sensitivity: 90% (10% undertriage)
  – Specificity: 50% (50% overtriage)
• Guidelines consensus based
  – not based on data
• Pediatric trauma, however, different than adult
  – Immediate operative intervention:
    • Adult: 3 – 5 %
    • Pediatric 0.3-0.6% (and this is decreasing)
American College of Surgeons: Surgeon at the Resuscitation

- Age-specific hypotension
- Respiratory compromise, obstruction, or intubation
- Gunshot wound to the neck, chest, or abdomen
- GCS score <8 after trauma
- Transfer of patients from other hospitals who receive blood to maintain vital signs
- Physician discretion
Loma Linda Rule: Surgeon at the Resuscitation

• Initial rule
  – Penetrating trauma
  – Age specific tachycardia

• Modified rule
  – Penetrating trauma
  – Age specific tachycardia
  – Age specific hypotension
Surgeon at the Resuscitation in Children  

- Retrospective trauma center data
- Evaluated prior criteria
- Outcome: Emergent general surgery within 1 hour
- 8,078 patients
  - 47 (0.6%) emergent surgery
- American College of Surgeons
  - Sensitivity: 80%, Specificity: 81%
- Loma Linda
  - Sensitivity: 69%, Specificity: 76%
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Secondary Triage: Categorization

- Physiologic: most important
- Anatomic: ~important
- Mechanism criteria: least important
Tiered (Graded) Criteria for Trauma Patients

- Safely identifies patients needing limited resources
  - Simon. Ped Emerg Care 2004; 20:5
  - Nuss. Ped Emerg Care 2001; 17:96

- Less resources utilized

- Mechanistic and age least important criteria for upgrading response
  - Kohn Acad EM 2004; 11:1
Three Tiered (Graded) Response

• Major
  – Large trauma team with surgeon

• Moderate
  – Large trauma team without surgeon
  – May upgrade if necessary

• Minor
  – Small trauma team:
  – May upgrade if necessary
Major Trauma Activation

- Penetrating injuries to neck, chest or abdomen
- GCS < 9 or deteriorating GCS
- SBP < 70 + (2 x age)
- Pulseless, injured extremity
- Transferred patient receiving blood
- Intubated patients
Major Trauma Activation

At least 10 people

- Emergency Medicine
  - Attending and senior resident (airway)
- Surgery
  - Attending, 3 additional surgery/EM residents
- 2 Nurses:
  - scribe/document and IV access/Blood pressure
- Radiology technician & Respiratory therapy
Moderate Trauma Activation (no Surgeon)

- Penetrating injuries to head or arms/legs above elbows/knees
- Flail chest
- Pelvic fractures
- Two or more long bone fractures
- Injured extremity with arterial bleeding
- Trauma and burns
Moderate Trauma Activation
(no Surgeon)

- Amputation proximal to wrist/ankle
- Limb paralysis
- Fall > 20 feet
  - Age < 15 years fall > 10 feet or 2x height
- GCS 9 – 13
- Respiratory rate < 10 or > 29 (for adolescents)
Moderate Trauma Activation

At least 8 people:

• Emergency Medicine
  – Attending and senior resident (airway)
• 2-3 Surgery (EM) residents
• 2 Nurses:
  – scribe/document and IV access/Blood pressure
• Radiology technician
• Respiratory therapy
Limited Trauma Activation

- MVA: High speed, rollover, ejection or Death
  - Extrication > 20 minutes
- Motorcycle > 20 MPH or separated from
- Auto vs Pedestrian/Bike > 5 MPH
- GCS = 14
- Chest/abdominal pain after trauma
- Crush or rollover by vehicle
Limited Trauma Activation

Only 2 or 3 people

• Emergency Medicine Attending/resident

• 1 Nurse
Conclusion

• Trauma team improves efficiency and decreases (↓) errors but limited data on impact on patient outcomes

• Best trauma team composition is unclear but individuals should be appropriately trained for their defined roles

• Tiered (graded) response to match patient needs

• Be prepared for the patient!!!