

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?



Is a Trauma Team Needed?

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

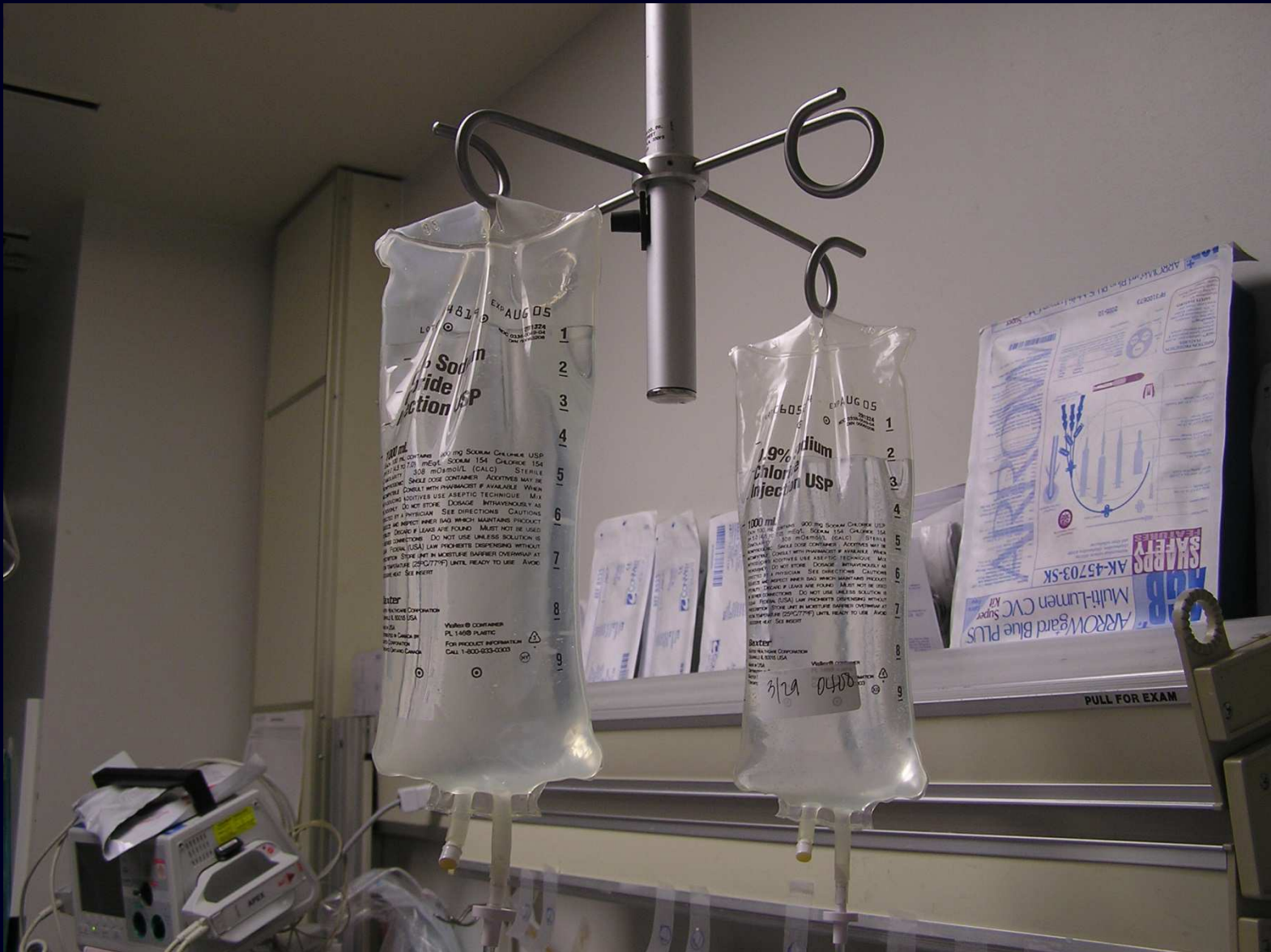


Most Important Aspect Impacting ED Care of Injured Children

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



American College of Surgeons

- 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

Steele R, Ann Emerg Med 2006;47:135

- Initial rule
 - Penetrating trauma
 - Age specific tachycardia
- Modified rule
 - Penetrating trauma
 - Age specific tachycardia
 - Age specific hypotension



Surgeon at the Resuscitation in Children

Boatwright JACS 2013; 216:1094

- 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%



Surgeon at the Resuscitation in Children

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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
 - Groner. J Ped Surg 2007; 42:1026
 - Holmes, W J Emerg Med 2013; 14:569
- Mechanistic and age least important criteria for upgrading response
 - Kohn Acad EM 2004; 11:1
 - Henry. Acad EM 1996; 3:1992



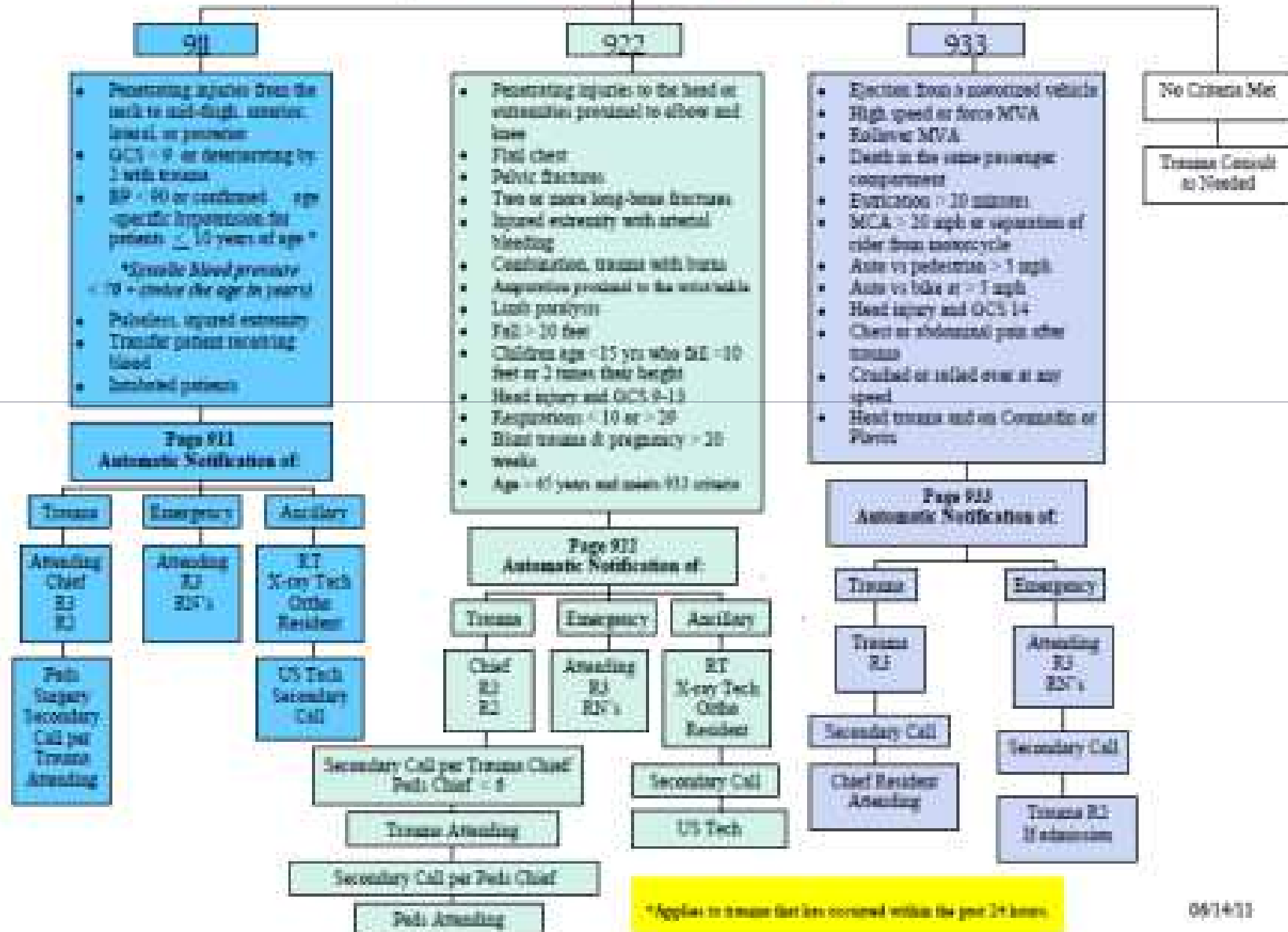
Three Tiered (Graded) Response

- Major
 - Large trauma team with surgeon
- Moderate
 - Large trauma team without surgeon
 - May upgrade if necessary
- Minor
 - Small trauma team:
 - May upgrade if necessary



TRALIMA ACTIVATION ALGORITHM

TRIAGE NURSE



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!!!





