TRAUMA TRIAGE

How does it work and have we got the system right?

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SESIH
OBJECTIVES

- Define Triage
- Rationale
- Describe Triage Tools
- Discuss evaluation of Triage Tools
- Have we got it right?
DEFINITION

- French - “trier” - to sort
TRIAGE

- Baron Dominique Jean Larré
- Changed the treatment of injured soldiers
  - Least injured first, return to war
  - Little improvement until Vietnam
- Is dynamic
- Occurs at many points
- Focus on pre-hospital
“The right patient to the right hospital in the right time”
TRAUMA TRIAGE

ACS-COT

Acceptable rates of undertriage 5%
- Rates of overtriage may be as high as 25 % - 50%
- Places enormous burden on triage systems already under-resourced
TRAUMA TRIAGE

OVER Triage
- Minimally injured pts are transported to Trauma Centers
- Result: Overburdens the system, no ill effect on pt care

UNDER Triage
- Severely injured pts are transported to Non-Trauma Centers
- Result: Hospitals may not be adequately equipped, and pt care may suffer
TRIAGE TOOLS

- Mechanism
- Anatomical
- Physiological
- Co-morbidities
- Field triage scores
MECHANISM
Pediatric and Adult Trauma Triage and Transport Pathways

STEP 1:
Cardiac Arrest with ongoing CPR

STEP 2: PHYSIOLOGY
Airway obstruction, severe respiratory compromise, respiratory arrest
Uncontrolled hemorrhage, shock syndrome
GCS <14, Motor Component of GCS <6, or AVPU = P or U

Pediatric:
- Respiratory Rate <10 or >60
- SBP: Neonate <60; <2 yrs <65; 2-6 yrs >70; 6-15 yrs >80
- Pediatric Trauma Score <9

Adult:
- Respiratory Rate <10 or >29
- SBP <90
- Revised Trauma Score <11

STEP 3: ANATOMY
Penetrating wounds to head, neck, torso
Open or depressed skull fracture, paralysis
Two or more proximal long bone fractures, unstable pelvic fracture
Flail chest, tension or open pneumothorax
Burns with airway involvement or with trauma
Amputation proximal to wrist or ankle

STEP 4: CONTRIBUTING FACTORS
Mechanism of Injury
- Adult fall >20 ft; Child fall >10 ft
- Ejection, rollover, death in same vehicle
- Extrication >20 minutes, impact >40 mph
- Vehicle deformity >20 inches
- Intrusion >12 inches
- Auto/pedestrian or auto/bicycle impact: adult >5 mph, child at any speed
- Pedestrian thrown or run over
- Motorcycle crash >20 mph rider separation

Medical Conditions
- Adult age >55; Pediatric age <5
- Cardiac diseases, respiratory disease
- Insulin-dependent diabetes, cirrhosis
- Morbid obesity, pregnancy
- Bleeding disorder, anticoagulant use
- Immunosuppressed
- Adult chest pain or dysrhythmias
- Poisoning: unable to maintain airway
- Hazardous material exposure

Patient Status Levels

Status I: Critical, life-threatening conditions such as inadequate ventilation and circulation requiring immediate intervention.

Status II: Potentially life-threatening / disabling conditions requiring rapid intervention after critical conditions are stabilized. These are indicated by physiologic indicators and serious anatomic injuries. Mechanism of injury and patient's medical condition may contribute to the seriousness of injury but are poor indicators of serious injury when used alone.

Status III: Conditions with stable vital signs and controlled bleeding which do not require rapid intervention.

Contact Medical Control; Transport to Local Hospital

Contact Medical Control
Consider ALS Intercept

Contact Medical Control
Consider Air Transport to REGIONAL TRAUMA HOSPITAL
Consider ALS Intercept

Contact Medical Control
Consider Air Transport to REGIONAL TRAUMA HOSPITAL
Consider ALS Intercept

Re-Evaluate
Physiologic Indicators
Contact Medical Control to Determine Destination:
- REGIONAL or AREA TRAUMA HOSPITAL

* NEW HAMPSHIRE TRAUMA SYSTEM

Development and printing of this card is supported in part by grant number 1 H07 MC 00082 01 from the Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau.
**Pediatric and Adult Trauma Triage and Transport Pathways**

**STEP 1:**
Cardiac Arrest with ongoing CPR

- **YES**
  - Contact Medical Control
  - Transport to Local Hospital
  - Consider ALS Intercept

- **NO**

**STEP 2: PHYSIOLOGY**

- Airway obstruction, severe respiratory compromise, respiratory arrest
- Uncontrolled hemorrhage, shock syndrome

- **NO**

<table>
<thead>
<tr>
<th>Pediatric</th>
<th>Adult</th>
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<tbody>
<tr>
<td>GCS &lt;14, Motor Component of GCS &lt;6, or AVPU = P or U</td>
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</tr>
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- **YES**
  - Contact Medical Control
  - Consider Air Transport to *REGIONAL TRAUMA HOSPITAL*
  - Consider ALS Intercept
FIELD TRIAGE SCORING

<table>
<thead>
<tr>
<th>Glasgow Coma Scale</th>
<th>Revised Trauma Score</th>
<th>Trauma Score</th>
<th>Coded Points</th>
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<tbody>
<tr>
<td>13 - 15</td>
<td>&gt;89</td>
<td>10 - 29</td>
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<tr>
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**GCS:**

**SBP:**

**Resp. Rate:**

**Total:**
RTS = 0.9368 GCS + 0.7326 SBP + 0.2908 RR

Range: 0 to 7.8408

Calculator available at: www.trauma.org

Weighted toward the GCS to compensate for major head injury without multisystem injury or major physiological changes.

EXAMPLE:  
SBP 90 (coded value 4) [4 x 0.7326 = 2.93]

RR 10 (coded value 4) [4 x 0.2908 = 1.16]

GCS 13 (coded value 4) [4 x 0.9368 = 3.74]

RTS = 7.841 → PS = .988
Survival Probability by Revised Trauma Score

Probability of Survival (Ps)

Revised Trauma Score (RTS)
WHICH TOOL TO USE

- MAP (Mechanism, Anatomy, Physiology) tools have high sensitivity resulting in low undertriage rates.
- But low specificity results in higher overtriage.
- Major trauma patients will be transported to TC.
- Some minor trauma patients will also...
WHICH TOOLS TO USE

- EAST Guidelines 2010
  - MAP combined with co-morbidities & demographics provides better triage than any single tool
  - Co-morbidities, field personnel judgment have lowest yields
  - Extrication time of > 20 mins, death of occupant of vehicle considered stand alone triage criteria
  - RTS, CRAMS, PI, TI, TTR – are not to be used as stand alone triage criteria
  - There should be increased weight given to age (>65) during triage
HAVE WE GOT THE SYSTEM RIGHT?

- Triage is a dynamic process
- Multiple Triage Tools exist
- Attempts to validate Triage are often based on vague definitions of major trauma
- Trauma care has changed significantly since the 1980's when many definitions arose
- What is required is a valid definition of major trauma before any accurate conclusions can be drawn