Trauma Summit: Field Triage and Re-triage – Obstacles and Solutions

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Objectives:

- Field Triage
  - Criteria (as is)
  - Evidence (problems?)

- 'Re-Triage'
  - Define
  - Delineate
Field Triage: CDC 2012

Physiologic Criteria (Step 1)

- ‘Highest level of care’
  - GCS ≤ 13 or
  - Systolic BP < 90 or
  - Respiratory rate < 10 or > 29 (< 20 in infant) or need for ventilatory support

Did not change to include

- GCS motor score
- Systolic BP < 110 in patients > 65 years
- shock index
Field Triage: CDC 2012

Anatomic Criteria (step 2)

- All penetrating injuries head, neck, torso, extremities proximal to elbow or knee
- Chest wall instability or deformity (e.g. flail chest)
- 2 or more proximal long bone fractures
- Crushed, degloved, mangled or pulseless extremity
- Amputations proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fractures
- Paralysis
Field Triage: CDC 2012

Mechanism of Injury (Step 3)

- Falls
  - Adults: > 20 feet (one story = 10 feet)
  - Children: > 10 feet or 2-3 times child’s height

- High risk auto crash
  - Intrusion: > 12 inches occupant, > 18 inches any site
  - Ejection (partial or complete)
  - Death in the same passenger compartment
  - Vehicle telemetry

- Auto- pedestrian

- Motorcycle crash > 20 mph
Field Triage: CDC 2012

Special Considerations (Step 4)

– Older Adults
  - Risk for injury/death increases with age > 55
  - SBP < 110 might represent shock after age 65
  - Low impact mechanisms (GLF) might result in severe injury

– Children
  - Should be triaged preferentially to pediatric capable trauma centers
Field Triage: CDC 2012

Special Considerations (Step 4)

- Anticoagulants and bleeding disorders
  - Patients with CHI at risk for rapid deterioration

- Burns
  - Without trauma: burn center
  - With trauma: triage to trauma center

- Pregnancy > 20 weeks

- EMS provider judgment
Field Triage: Obstacles

- Evidence Basis for Mechanism of Injury guidelines is flawed
  - Retrospective
  - Do NOT control for whether the patients met physiologic or anatomic criteria
  - Vehicle space intrusion; with new vehicles, ‘crumple zones’, etc, perhaps the focus should be the patient, not the body shop
Mechanism of Injury?

- Trauma Team Activation Criteria
- Retrospective review of 809 patients, 185 with ISS,
  - Overall sensitivity of 87%, PPV 22% and overtriage of 78%
  - Mechanism had sensitivity of 14%, PPV of 7% and overtriage of 93%
  - Acta Anaesthesiol Scand 2007; 51: 1178-83
Field Triage: Obstacles

Inexact science

- ISS $> 15$ as threshold for severe injury
- ISS is derived retrospectively after all injuries identified (usually after discharge)
- NOT available to pre-hospital or even ED personnel
- Other factors (need for ICU, immediate surgery) also used

Not everyone arrives via EMS
Re-Triage

- What to do with the patient that doesn’t belong where he is.....
  - Nothing, just get him outta here...
  - Stabilize and Transfer....
  - The best that you can....
  - Depends
    - Urban trauma system
    - Rural hospital
Direct Transport vs. Transfer

- Retrospective study, comparing direct transport (2765) versus transferred (1608) trauma patients
  - Similar for age, gender, mechanism of injury
  - Mean ISS 14
  - Transferred patients with
    - Higher overall mortality (8.9% vs 4.8%, p<0.003)
    - Longer LOS (16 vs. 13 days, p = 0.02)
- J Trauma 1997; 43: 288-295
Inter-Facility Transfer

- J Trauma 2011; 71; 1885-1900
  - No difference in mortality between transfer and direct admissions
  - Excluded patients dying at outlying facilities

- J Trauma 2003; 55: 444-449
  - Interfacility transfers in mature urban system do not appear to impact outcome
    - Lower mortality
    - Greater resource use
Secondary Overtriage

Secondary overtriage defined as patients transferred with ISS < 10, no surgery required and discharged < 48 hrs

- 64 of transfer patients with minor injury
- 39% met overtriage criteria
- Excessive overtriage calls for development of regional inclusive system with established primary and secondary (re-triage) guidelines to improve access and system efficiency

Trauma Transfer Poster Re-TRIAGE

- Developed based upon recommendations from the American College of Surgeons
- Reflective of current practices
- Developed by all trauma centers and two local EMS Agency representatives within the Central RTCC

GOAL:
- To improve uniformity of transfers
- Decrease variability & therefore decrease error
EMERGENCY TRANSFER: Call Trauma Center immediately for immediate acceptance. **Avoid unnecessary studies that would delay the transfer.** The goal is to transfer the patient within 1 hour of arrival.

- **Blood Pressure**
  - Blood Pressure less than 90
  - Labile BP despite 2L of crystalloids
  - Patient requires blood products to maintain their blood pressure

- **GCS**
  - Less than or equal to 8 or lateralizing signs (intubate)

- Penetrating injuries to the head, neck, torso
- Fracture/dislocation with loss of distal pulses and/or ischemia
- Pelvic ring disruption or unstable pelvic fracture
- Vascular Injuries with active arterial bleeding
URGENT TRANSFER: Call Trauma Center and initiate transfer as soon as any of the following are identified. **Avoid unnecessary studies that would delay the transfer.** The goal is to transfer the patient less than 4 hours of arrival.

<table>
<thead>
<tr>
<th>Central Nervous System</th>
<th>Multi-System Trauma</th>
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<tbody>
<tr>
<td>GCS deteriorating by 2 during</td>
<td>Burns with associated injuries (Transfer to a combined</td>
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<tr>
<td>observation</td>
<td>Trauma/Burn Center)</td>
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<tr>
<td>Open or depressed skull fracture</td>
<td>Major injury to more than two body regions</td>
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<tr>
<td>GCS less than 14 with abnormal CT</td>
<td>Signs of hypo-perfusion with a base deficit worse than -6</td>
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<tr>
<td>scan (not meeting criteria above)</td>
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<td>Spinal cord injury</td>
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<tr>
<th>Chest</th>
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<td>Major chest wall injury with more</td>
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<td>than 2 unilateral rib fractures</td>
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<td>Bilateral rib fractures with pulmonary</td>
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<tr>
<td>contusion</td>
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<tr>
<td>Bilateral pulmonary contusions</td>
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<td>Wide mediastinum or other signs</td>
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<td>suggesting great vessel injury</td>
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<td>Cardiac injury</td>
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<th>Pelvis/Abdomen</th>
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<tr>
<td>Intra-abdominal injury confirmed</td>
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<tr>
<td>by CT scan or ultrasound</td>
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<td>demonstrating abdominal fluid</td>
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<th>Major Extremity Injuries</th>
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<td>Open long-bone fractures</td>
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<tr>
<td>Two or more long bone fractures</td>
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<td>Crush injury/mangled extremity</td>
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<th>Other</th>
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<td>Co-Morbid Factors (consider these special circumstances when deciding whether to transfer)</td>
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<tr>
<td>Adults greater than 55 years of age with significant trauma</td>
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<td>Children less than 6 years of age with significant trauma</td>
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<td>Significant torso injury with advanced co-morbid disease (cardiac or respiratory disease, insulin-dependent diabetes, morbid obesity, or immunosuppression)</td>
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<td>Pregnancy greater than 20 weeks gestation</td>
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<td>End Stage Renal Disease requiring dialysis</td>
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CRTCC System Guidelines for Arranging for a Trauma Transfer

- Developed to expedite the transfer and ultimate care of the critically injured trauma patient
- Use conjunction with the “CRTCC Suggested Criteria for Consideration of Transfer to a Trauma Center”.
- Contact the appropriate trauma center for transfer. Using the MIVT acronym, the follow information should be provided in a concise manner:
  - Age of patient
  - Mechanism of injury
  - Identified injuries
  - Vital sign and pertinent symptoms
  - Treatment initiated
- Contact EMS dispatch and request an ambulance or helicopter “stat”
- Send copies of all pertinent paperwork and a CD containing any radiological studies already done
Summary

- CDC/ACS Triage criteria are the current ‘standard’
  - Better research NEEDED

- Goal is to facilitate the right patient to the right place at the right time

- Goal of re-triage is to transfer as soon as possible to the right place
  - Avoid any unnecessary tests/studies that would delay the transfer
  - Use of a tool might facilitate the process