Is it *Really* That Bad?

Trauma Triage and Decision Making

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Objectives

- Review triage, primary, and secondary assessments of the trauma patient.
- Identify characteristics that indicate need for trauma center referral.
- Recognize the role of intuition in trauma assessment.
- Debate our role in the determination of trauma severity.

Trauma

- "Injury to living tissue caused by an extrinsic agent (ENA, 2014, p. 9)."
- Understanding both the energy and the underlying anatomy is crucial
- Remember to ask EMS or bystanders who witnessed the injury

Trauma Triage

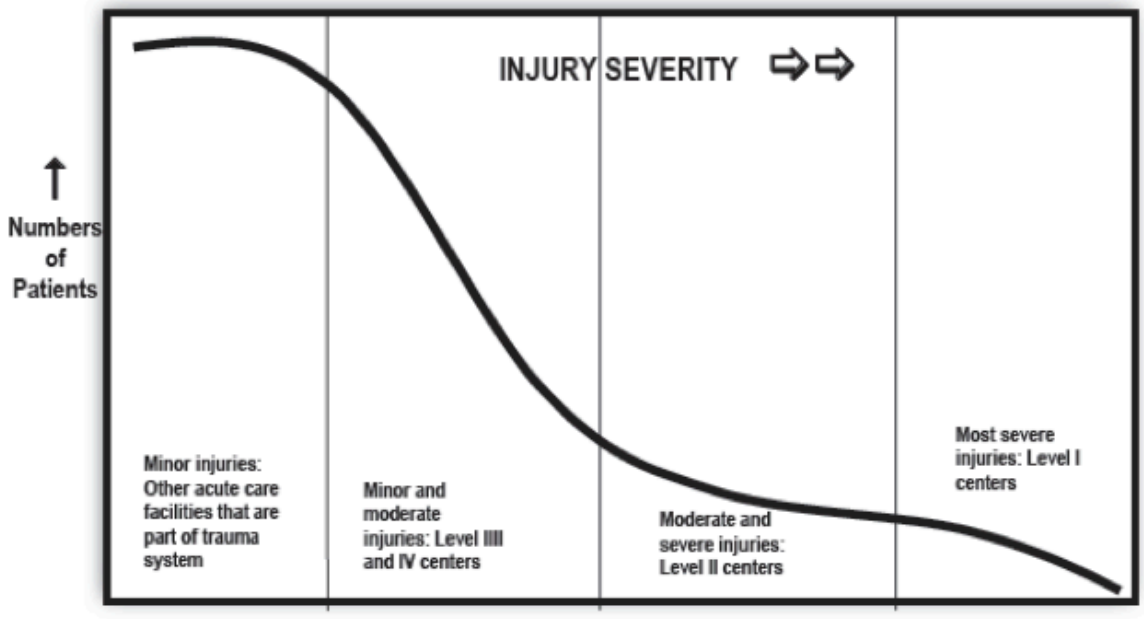
"Every effort should be made to get the patient to the right place the first time, except in extremes of distance or travel conditions (ACS, 2014, p.24)."

"The prehospital patient care record should include the type and mechanism of injury; the anatomic and physiologic condition of the patient; relevant times of the incident; extrication; on-scene care; and the timing of, and response to, interventions (p.25)."

"Some trauma programs have found that EMS "time-outs" to allow for the unfettered exchange of a patient summary are useful in ensuring continuity of care (p.26)."

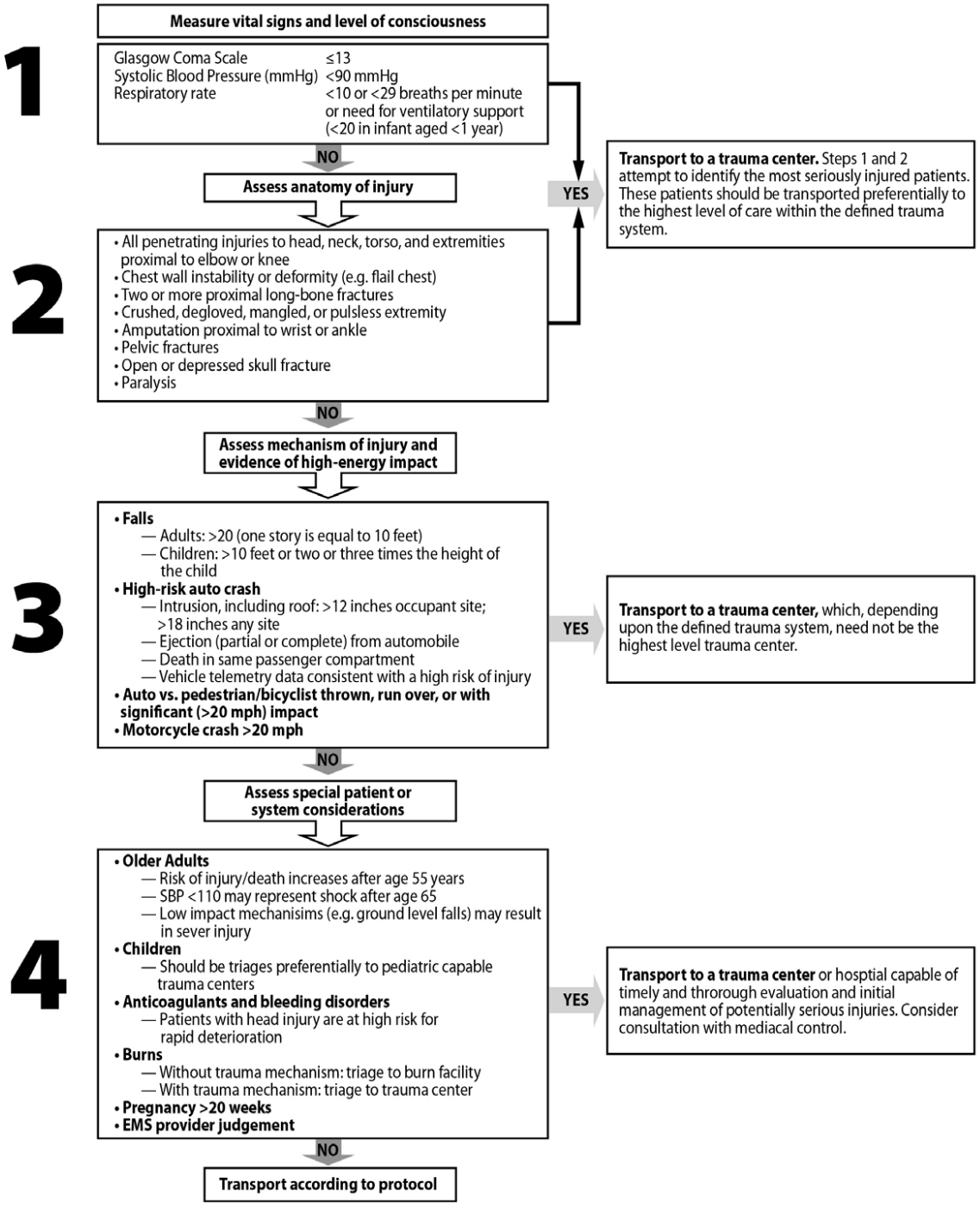
The Inclusive Trauma System (p.9):

Figure 2. The Inclusive Trauma System



The *inclusive* trauma system uses the full spectrum of acute care facilities to provide trauma care.

2011 Guidelines for Field Triage of Injured Patients



When in doubt, transport to a trauma center.

Find a plan to save lives, at www.cdc.gov/Fieldtriage

Trauma Triage

- "At the scene of the injury, time and resources limit the availability of providers to determine the full extent of the injuries sustained (Moore, 2012)."
- "The needs of all injured patients are addressed ***wherever*** they are injured and ***wherever*** they receive care (ACS, 2014, p.1)."
- "In general, priority has been given to reduction of undertriage, because Undertriage may result in preventable mortality or morbidity from delays in definitive care (ACS, 2014, p.25)."
- "Asking discriminating questions can be key in determining the problem and, ultimately, the patient's priority (Gurney, 2015)."
- "Experienced ED nurses typically use critical thinking intertwined with intuition when making precise triage acuity decisions, and **continued education** with opportunities for **new experiences** could enhance the accuracy of their future triage decisions (Cork, 2014)."

Assessment of Blood Consumption (ABC) Score

- Looks at 4 parameters:
  - Penetrating mechanism
  - Positive FAST
  - Systolic BP<90mmHg
  - HR >120
- A positive score in 2 or more yields a 75% sensitivity/85% specificity in predicting the need for a massive transfusion (Cantle & Cotton, 2016).

Injury Severity Score (ISS)

- Consists of abbreviated injury scores (AIS) for the three most severely injured body regions (Kimura & Tanaka, 2018).

Revised Trauma Score (RTS)

- Weighted physiologic score of 3 variables:
  - Glasgow Coma Score (GCS)
  - Respiratory rate
  - Systolic BP (Kimura & Tanaka, 2018)

Trauma and Injury Severity Score (TRISS)

- Logistic regression model using:
  - ISS
  - RTS
  - Age
  - Mechanism of Injury (Kimura & Tanaka, 2018)

Trauma-Associated Severe Hemorrhage (TASH) Score

- Looks at 7 weighted variables:
  - Systolic BP
  - Hemoglobin
  - Intrabdominal fluid
  - Complex long bone/pelvic fracture(s)
  - HR
  - Base excess

    - Gender
- Sensitivity 31-41%/Specificity 89-93% AUROC 0.89-0.90 to predict massive transfusion (Cantle & Cotton, 2016)

Shock Index

- SI is a simple ration of HR/SBP
- A value of 0.7 represents normal
- A value >1.0 is highly indicative of hemodynamic instability and mortality
- Can be recognized without any calculations: if your HR is greater than your SBP your SI is > 1.0
- When substituted into the Field Guidelines for Triage/National Trauma Triage Protocol (NTTP) in place of SBP<90mmHg in STEP 1:
    - Decreased UNDER triage by 5.9%
    - Increased OVER triage by only 1.3% (Haider et al., 2016)
- Correlates with the degree of shock, decreased tissue oxygenation, and left ventricular performance
- Is a better predictor than HR or SBP alone
- Is more sensitive than ABC score for massive transfusion prediction
- Is a significant early risk indicator in elderly patients (Scholl et al., 2018)

Reverse Shock Index (rSI)

- Is a ratio of SBP/HR
- A value <1.0 is correlated higher mortality rate, longer ICU stay, and more aggressive care in the emergency department (Kuo et al., 2016)

Delta Shock Index (ΔSI)

- Delta SI=ED SI- Field SI
- Delta SI >0.1 associated with increased hazard of death (hazard ratio=1.36) and mortality (16.6% vs. 9.5%, p<0.001)

Shock Index Pediatric Age-Adjusted (SIPA)

- An increased SI, pediatric age-adjusted is superior to age-adjusted hypotension to identify children likely to require emergency operation, intubation, or early transfusion
- SI cutoffs >1.22 (ages 4-6), >1.0 (7-12), and >0.9 (13-16).

CT Scans

- "However, delay of transfer to perform tests such as computed tomography scans in hospitals with no surgical capability only delays definitive care and should be avoided (ACS, 2014, p.31)."
- Make the decision to transfer first, *then* make the decision to scan.
- Have clear protocols from your receiving institution (involve them in the decision to scan) with regards to specifics such as the slice size, formatting of images, need for PO contrast, etc.

Your Role

*"The emergency nurse maintains **competence** within, and **accountability** for, emergency nursing practice (ENA, 2011, p.10)."*

CDC Injury Prevention & Control: Data&Statistics (WISQARS™)

http://www.cdc.gov/injury/wisqars/LeadingCauses.html

TNCC/ATLS A-I Mnemonic

A Airway & Alertness & Cervical Spine Immobilization

B Breathing & Ventilation

C Circulation & Control of Hemorrhage

D Disability (Neurologic Status)

E Exposure & Environmental Control

F Full Set of Vitals & Family Presence

G Get Resuscitation Adjuncts

- **Laboratory Studies**
- **Monitor (Cardiac)**
- **Naso/Orogastric Tube Consideration**
- **Oxygenation & Ventilation (SPO2 and ETCO2 Monitor)**
- **Pain Management**

H History & Head-to-Toe Exam

I Inspect Posterior Surfaces

(ENA, 2014, p.39)

Revised Trauma Score - Table 1

Systolic BP	Respiratory Rate				
	+ 30	29 - 10	9 - 6	5 - 1	0
> 90	A1	B1	C1	D1	E1
89 -76	A2	B2	C2	D2	E2
75 - 50	A3	B3	C3	D3	E3
49 - 1	A4	B4	C4	D4	E4
0	A5	B5	C5	D5	E5

(Carry Alphanumeric Value from Table 1 to RTS - Table 2)

Revised Trauma Score - Table 2

TABLE 1 VALUE	Glascow Coma Scale				
	15 - 13	12 - 9	8 - 6	5 - 4	3
A1	7.6	6.6	5.7	4.7	3.8
A2	6.8	5.9	4.9	4.0	3.1
A3	6.1	5.1	4.2	3.3	2.3
A4	5.4	4.4	3.5	2.5	1.6
A5	4.6	3.7	2.7	1.8	0.9
B1	7.8	6.9	6.0	5.0	4.1
B2	7.1	6.2	5.2	4.3	3.4
B3	6.4	5.4	4.5	3.6	2.6
B4	5.6	4.7	3.8	2.8	1.9
B5	4.9	4.0	3.0	2.1	1.2
C1	7.3	6.3	5.4	4.4	3.5
C2	6.5	5.6	4.7	3.7	2.8
C3	5.8	4.9	3.9	3.0	2.0
C4	5.1	4.1	3.2	2.3	1.3
C5	4.3	3.4	2.5	1.5	0.6
D1	7.0	6.0	5.1	4.2	3.2
D2	6.2	5.3	4.4	3.4	2.5
D3	5.5	4.6	3.6	2.7	1.8
D4	4.8	3.8	2.9	2.0	1.0
D5	4.0	3.1	2.2	1.2	0.3
E1	6.7	5.7	4.8	3.9	2.9
E2	5.9	5.0	4.1	3.1	2.2
E3	5.2	4.3	3.3	2.4	1.5
E4	4.5	3.5	2.6	1.7	0.7
E5	3.7	2.8	1.9	0.9	0.0

The Revised Trauma Score is a physiological scoring system, with high inter-rater reliability and demonstrated accuracy in predicting death. It is scored from the first set of data obtained on the patient, and consists of Systolic Blood Pressure, Respiratory Rate and Glasgow Coma Scale.

RTS <4 has been proposed to identify those patients who should be treated in a trauma center.

REVISED TRAUMA SCORE FAST REFERENCE CHART

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