# TRAUMA TRIAGE

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


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# 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

# RATIONALE

"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

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

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

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

NO

**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

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

NO

**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
Immunosupressed
Adult chest pain or dysrhythmias
Poisoning: unable to maintain airway
Hazardous material exposure

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

NO

**Contact Medical Control; Transport to Local Hospital**

*** NEW HAMPSHIRE TRAUMA SYSTEM**

## 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.

N. H. Department of Safety — Division of Emergency Medical Services


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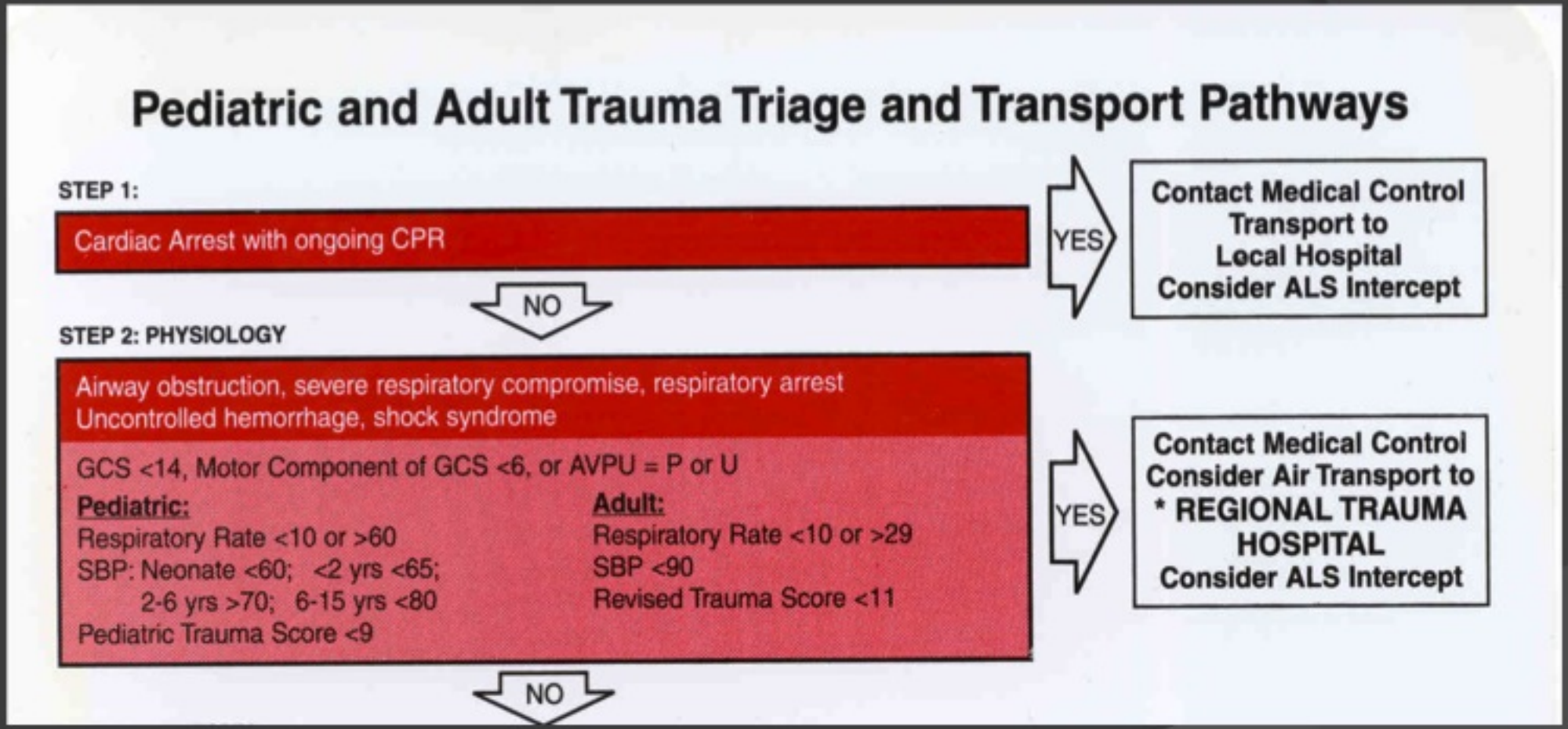
# PHYSIOLOGY


Pediatric and Adult Trauma Triage and Transport Pathways
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YES
Contact Medical Control
Consider Air Transport to
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Consider ALS Intercept
NO

# FIELD TRIAGE SCORES

| Revised Trauma Score - Adult | | | |
|---|---|---|---|
| Glasgow Coma Scale | SBP | Respiratory Rate | Coded Points |
| 13 - 15 | >89 | 10 - 29 | 4 |
| 9 - 12 | 76 - 89 | >29 | 3 |
| 6 - 8 | 50 - 75 | 6 - 9 | 2 |
| 4 - 5 | 1 - 49 | 1 - 5 | 1 |
| 3 | 0 | 0 | 0 |
| 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

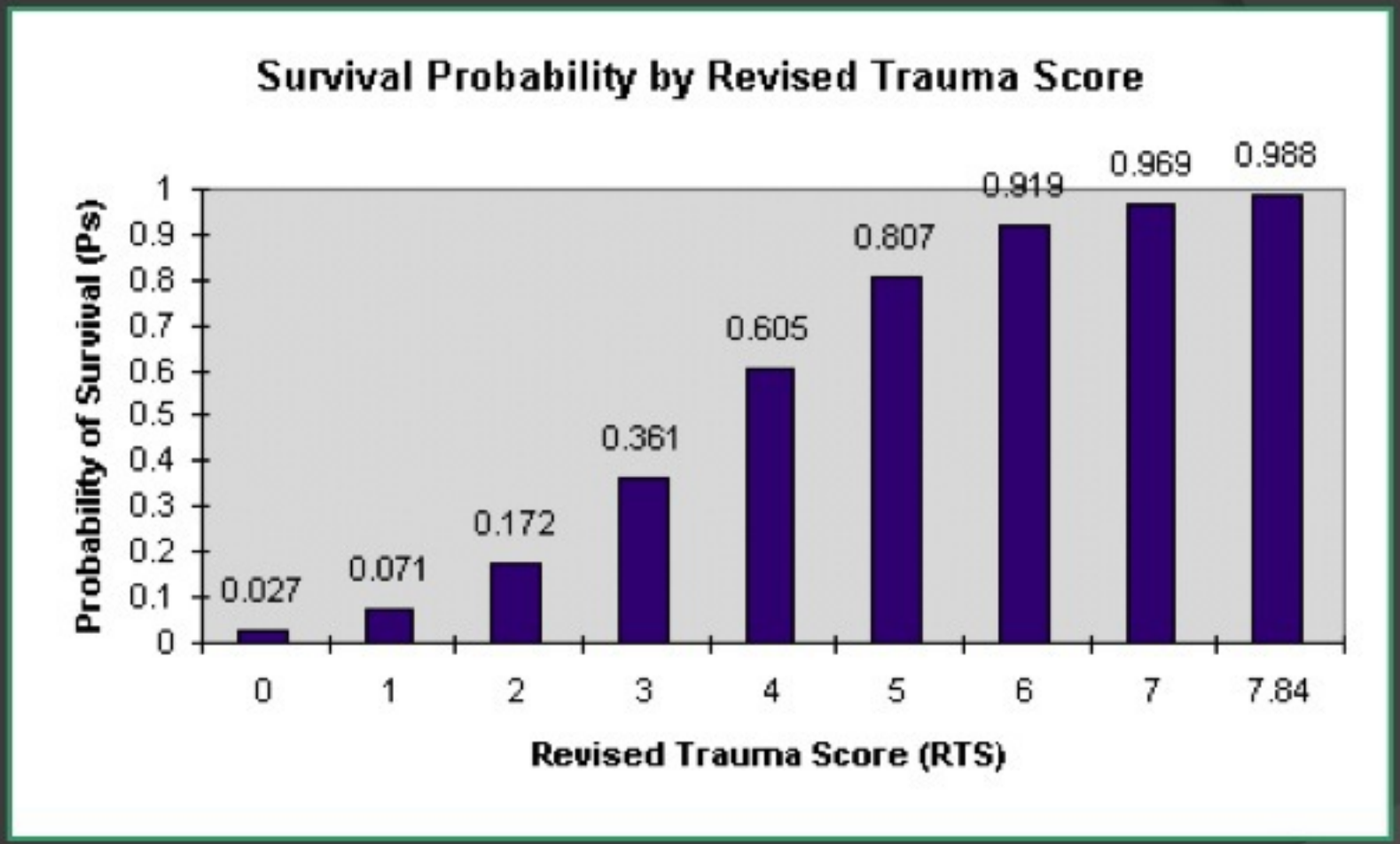
Weighted toward the GCS to compensate for major head injury without multisytem injury or major physiological changes.

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)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.027
0.071
0.172
0.361
0.605
0.807
0.919
0.969
0.988
0
1
2
3
4
5
6
7
7.84
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