

# TRAUMA PATIENT TRIAGE DEFINITIONS

## Trauma Triage

Since patients differ in their initial response to injury, trauma triage is an inexact science. Current patient identification criteria does not provide 100% percent sensitivity and specificity for detecting injury. As a result, trauma systems are designed to over-triage patients in order not to miss a potentially serious injury. Under-triage of patients should be avoided since a potentially seriously injured patient could be delivered to a facility not prepared to manage their injury. Large amounts of over-triage is not in the best interest of the Trauma System since it will potentially overwhelm the resources of the facilities essential for the management of severely injured patients.

## Priority 1 Trauma Patients

These are patients with high energy blunt or penetrating injury causing physiological abnormalities or significant single or multisystem anatomical injuries. These patients have time sensitive injuries requiring the resources of a designated Level I, Level II, or Regional Level III Trauma Center. These patients should be directly transported to a Designated Level I, Level II, or Regional Level III facility for treatment but may be stabilized at a Level III or Level IV facility, if needed, depending on location of occurrence and time and distance to the higher level trauma center. If needed these patients may be cared for in a Level III facility if the appropriate services and resources are available.

### Physiological Compromise Criteria:

- Hemodynamic Compromise-Systolic BP <90 mmHg  
Other signs that should be considered include:
  - Sustained Tachycardia
  - Cool diaphoretic Skin
- Respiratory Compromise-RR<10 or >29 Breaths/Minutes  
Or <20 in infant <1 year
- Altered Mentation- of trauma etiology- GCS <14

### Anatomical Injury Criteria

- Penetrating injury of head, neck, chest/abdomen, or extremities proximal to elbow or knee.
- Amputation above wrist or ankle.
- Paralysis or suspected spinal fracture with neurological deficit.
- Flail chest.
- Two or more obvious proximal long bone fractures (upper arm or thigh).
- Open or suspected depressed skull fracture.
- Unstable pelvis or suspected pelvic fracture.
- Tender and/or distended abdomen.
- Burns associated with Priority I Trauma
- Crushed, degloved, or mangled extremity

## Priority 2 Trauma Patients

These are patients with potentially time sensitive injuries due to a high energy event (positive mechanism of injury) or with a less severe single system injury but currently with no physiological abnormalities or significant anatomical injury.

### I. Significant Single System Injuries

- Neurology: Isolated head trauma with transient loss of consciousness or altered mental status but currently alert and oriented.
- Orthopedic: Single proximal and distal extremity fractures (including open) from high energy event, isolated joint dislocations-knee, hip, elbow, shoulder without neurovascular deficits, and unstable joint (ligament) injuries without neurovascular deficits.
- Maxillofacial trauma: Facial lacerations; such as those requiring surgical repair, isolated open facial fractures or isolated orbit trauma with or without entrapments, or avulsed teeth.

# TRAUMA PATIENT TRIAGE DEFINITIONS

## High Energy Event

Patient involved in rapid acceleration deceleration events absorb large amounts of energy and are at an increased risk for severe injury despite normal vital signs on their initial assessment. Five to fifteen percent of these patients, despite normal vital signs and no apparent anatomical injury on initial evaluation, will have a significant injury discovered after a full trauma evaluation with serial observations. Determinates to be considered are direction and velocity of impact and the use of personal protection devices. Motor vehicle crashes when occupants are using personal safety restraint devices may not be considered a high-energy event. Personal safety devices will often protect the occupant from absorbing high amounts of energy even when the vehicle shows significant damage. High Energy Events:

- Ejection of the patient from an enclosed vehicle
- Auto/pedestrian or auto/bike or motorcycle crash with significant impact (> 20 mph) impact with the patient thrown or run over by a vehicle.
- Falls greater than 20 feet for adult, >10 feet for pediatric or distance 2-3 times height of patient
- Significant assault or altercations
- High risk auto crash
  - The following motor vehicle crashes particularly when the patient has not used personal safety restraint devices:
    - Death in the same passenger compartment
    - Rollover
    - High speed auto crash
    - Compartment intrusion greater than 12 inches at occupant site or >18 inches at any site
    - Vehicle telemetry data consistent with high risk injury.

## Medic Discretion

Since trauma triage is an inexact science and patients differ in their response to injury, clinical judgment by the medic at the scene is an extremely important element in determining the destination of all patients. If the medic is concerned that a patient may have a severe injury which is not yet obvious, the patient may be upgraded in order to deliver that patient to the appropriate level Trauma Center. Paramedic suspicion for a severe injury may be raised by but not limited to the following factors:

- Age greater than 55
- Age less than 5
- Extremes of environment
- Patient's previous medical history such as:
  - Anticoagulation or bleeding disorders
  - End stage renal disease on dialysis
- Pregnancy (>20 weeks)

## **Priority 3 Trauma Patients**

These patients are without physiological abnormalities, altered mentation, neurological deficit, or a significant single system injury that has been involved in a low energy event. These patients should be treated at the nearest treating facility or the patient's hospital of choice.

- Example: Same level fall with extremity or hip fracture.

# ADULT PRE-HOSPITAL TRIAGE AND TRANSPORT GUIDELINES

## Oklahoma Model Trauma Triage Algorithm

- INABILITY TO SECURE AIRWAY
- TRAUMATIC ARREST

**YES**

GO DIRECTLY TO NEAREST APPROPRIATE FACILITY

### PHYSIOLOGICAL COMPROMISE CRITERIA

### PRIORITY I

- Hemodynamic Compromise<sup>1</sup>-Systolic BP < 90mmHg  
Or signs that should be considered include:
  - Sustained tachycardia
  - Cool diaphoretic skin
- Respiratory Compromise<sup>2</sup>- RR < 10 or > 29 breaths/minute  
or < 20 in infant < 1 yr
- Altered Mentation of trauma etiology<sup>3</sup>- GCS < 14

**NO** ↓

#### ANATOMICAL INJURY

- Penetrating injury of head, neck, chest abdomen, or extremities proximal to elbow or knee.
- Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia without significant trauma transport to regional Burn Center. Burns > 10% with significant trauma transport to trauma center.
- Amputation above wrist or ankle
- Paralysis or suspected spinal fracture with neurological deficit
- Flail chest
- Two or more obvious proximal long bone fractures [upper arm or thigh]
- Open or suspected depressed skull fracture
- Unstable pelvis or suspected unstable pelvic fracture
- Tender and/or distended abdomen
- Crushed, degloved, or mangled extremity

**YES**

INITIATE TRAUMA TREATMENT PROTOCOL

ACTIVATE TRAUMA SYSTEM

**RAPID** transport to the designated Level I,II, or Regional Level III Trauma Center according to the Regional Trauma Plan but may be stabilized at a Level III or IV facility depending on location of receiver and time and distance to the higher level trauma center.

Air Rendezvous may be necessary considering time & distance constraints. If conditions do not permit air transport then consider ALS rendezvous. Stabilization may occur either in the field or at the nearest appropriate facility.

Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia *without* significant trauma transport to regional Burn Center. Burns >10% *with* significant trauma transport to trauma center.

**YES**

**NO** ↓

### RISK OF SERIOUS INJURY - SINGLE SYSTEM INJURY

*Patients with potentially time sensitive injuries due to a high energy event (positive mechanism of injury) but currently with no physiological abnormalities or significant anatomical injury, or patients with less severe single system injury.<sup>4</sup>*

- Ejection (partial or complete) of the patient from an enclosed vehicle
- Auto/pedestrian, auto/bike, or motorcycle crash with significant impact (>20 mph) and patient thrown or run over by vehicle
- Falls greater than 20 feet or 2-3 times height of patient
- Significant assault or altercations
- High risk auto crash<sup>5</sup>
- Neurology: Isolated head trauma with transient loss of consciousness or altered mental status but currently alert and oriented
- Orthopedic: Single proximal and distal extremity (including open) from high energy event, isolated joint dislocations-knee, hip, elbow, shoulder without neurovascular deficits, and unstable joint (ligament) injuries without neurovascular deficits.
- Maxillofacial trauma: Facial lacerations; such as those requiring surgical repair, isolated open facial fractures or isolated orbit trauma with or without entrapments, or avulsed teeth.

**YES**

### PRIORITY II

INITIATE TRAUMA TREATMENT PROTOCOL

**PROMPT** transport to the designated Level III Trauma Center or higher depending on location according to the Regional Trauma Plan

**YES**

**NO** ↓

**CONSIDER<sup>6</sup>** Co-morbid factors  
-Gestalt-EMS clinical judgment

**NO**

### PRIORITY III

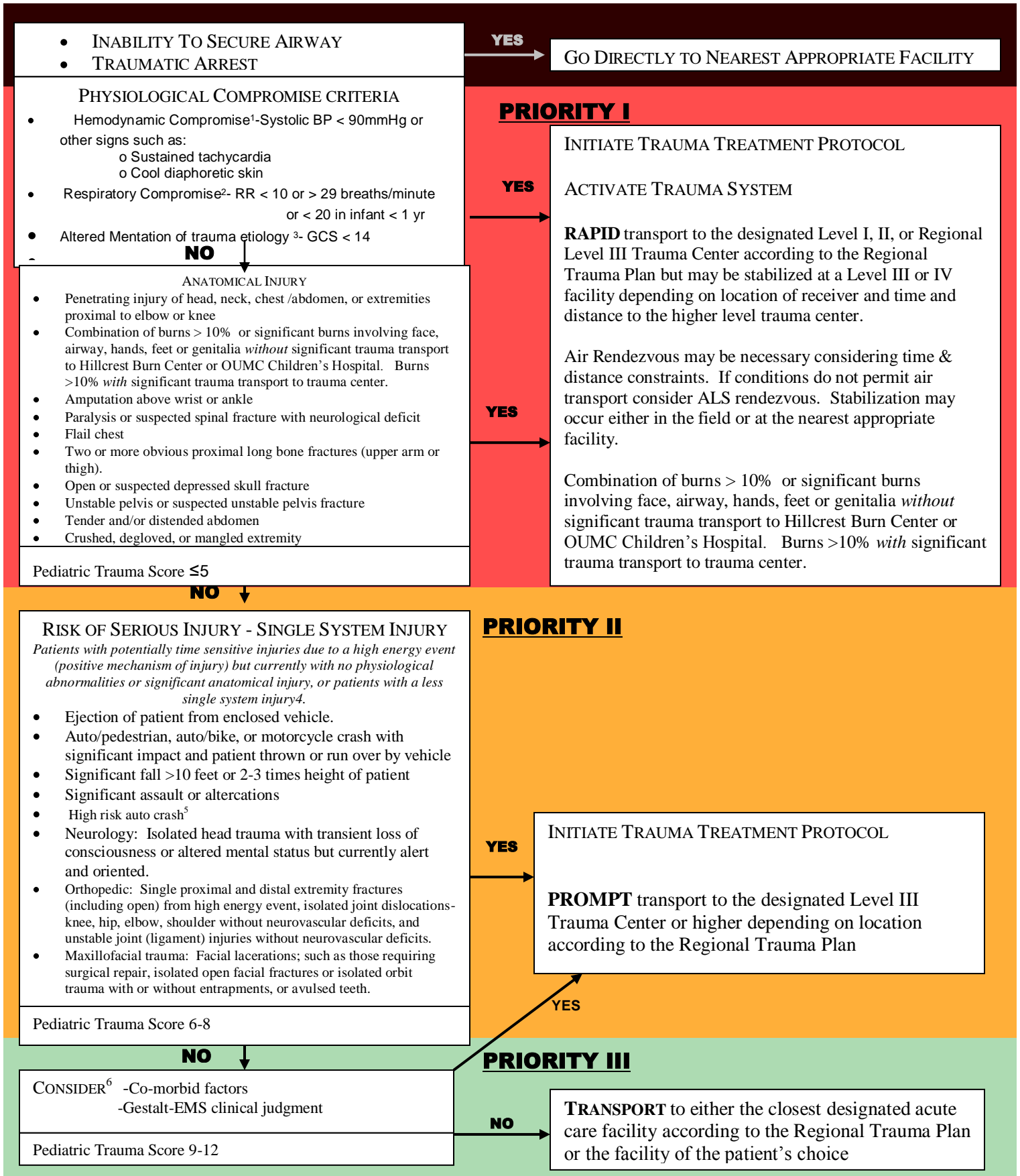
**TRANSPORT** to either the closest Level IV Trauma Center or higher depending on location according to the Regional Trauma Plan or the facility of the patient's choice

**ADULT PRE-HOSPITAL  
TRIAGE AND TRANSPORT GUIDELINES**  
Oklahoma Model Trauma Triage Algorithm

1. In addition to hypotension: pallor, tachycardia or diaphoresis may be early signs of hypovolemia
2. Tachypnea (hyperventilation) alone will not necessarily initiate this level of response.
3. Altered sensorium secondary to sedative-hypnotic will not necessarily initiate this level of response.
4. High Energy Event signifies a large release of uncontrolled energy. Patient is assumed injured until proven otherwise, and multisystem injuries may exist. Determinants to be considered by medical professionals are direction and velocity of impact, use of personal protection devices, patient kinematics and physical size and the residual signature of energy release (e.g. Major vehicle damage). Motor vehicle crashes when occupants are using personal safety restraint devices may not be considered a high energy event because the personal safety restraint will often protect the occupant from absorbing high amounts of energy.
5. The following motor vehicle crashes particularly when the patient has not used personal safety restraint devices:
  - a. Death in the same passenger compartment
  - b. Rollover
  - c. High speed auto crash
  - d. Compartment intrusion greater than 12 inches at occupant site or > 18 inches at any site
  - e. Vehicle telemetry data consistent with high risk of injury
6. Since trauma triage is an inexact science and patients differ in their response to injury, clinical judgment by the medic at the scene is an extremely important element in determining the destination of all patients. If the medic is concerned that a patient may have a severe injury which is not yet obvious, the patient may be upgraded in order to deliver that patient to the appropriate level Trauma Center. EMS provider suspicion for a severe injury may be raised by but not limited to the following factors:
  - Age greater than 55
  - Age less than 5
  - Extremes of environment
  - Patient's previous medical history such as:
    - Anticoagulation or bleeding disorders
    - End state renal disease on dialysis
  - Pregnancy (>20 weeks)

# PEDIATRIC (≤ 16 YEARS) PRE-HOSPITAL TRIAGE AND TRANSPORT GUIDELINES

## Oklahoma Model Trauma Triage Algorithm



Approved : OTSIDAC 02/01/06

Revised: OTSIDAC 08/01/07; 02/06/08, 08/06/08; 02/03/10

Clarification Revision by MAC: 11/19/08

**PEDIATRIC (≤ 16 YEARS) PRE-HOSPITAL  
TRIAGE AND TRANSPORT GUIDELINES**

Oklahoma Model Trauma Triage Algorithm

1. In addition to hypotension: pallor, tachycardia or diaphoresis may be early signs of hypovolemia
2. Tachypnea (hyperventilation) alone will not necessarily initiate this level of response.
3. Altered sensorium secondary to sedative-hypnotic will not necessarily initiate this level of response.
4. High Energy Event signifies a large release of uncontrolled energy. Patient is assumed injured until proven otherwise, and multisystem injuries may exist. Determinants to be considered by medical professionals are direction and velocity of impact, use of personal protection devices, patient kinematics and physical size and the residual signature of energy release (e.g. Major vehicle damage). Motor vehicle crashes when occupants are using personal safety restraint devices may not be considered a high energy event because the personal safety restraint will often protect the occupant from absorbing high amounts of energy.
5. The following motor vehicle crashes particularly when the patient has not used personal safety restraint devices:
  - a. Death in the same passenger compartment
  - b. Rollover
  - c. High speed auto crash
  - d. Compartment intrusion greater than 12 inches at occupant site or > 18 inches at any site
  - e. Vehicle telemetry data consistent with high risk of injury
6. Since trauma triage is an inexact science and patients differ in their response to injury, clinical judgment by the medic at the scene is an extremely important element in determining the destination of all patients. If the medic is concerned that a patient may have a severe injury which is not yet obvious, the patient may be upgraded in order to deliver that patient to the appropriate level Trauma Center. EMS provider suspicion for a severe injury may be raised by but not limited to the following factors:
  - Age greater than 55
  - Age less than 5
  - Extremes of environment
  - Patient's previous medical history such as:
    - Anticoagulation or bleeding disorders
    - End state renal disease on dialysis
  - Pregnancy (>20 weeks)

**PEDIATRIC (≤ 16 YEARS) PRE-HOSPITAL  
TRIAGE AND TRANSPORT GUIDELINES**  
Oklahoma Model Trauma Triage Algorithm

<b>Pediatric Trauma Score (PTS)</b>				
<b>Components</b>	<b>+2</b>	<b>+1</b>	<b>-1</b>	<b>Score</b>
Weight	>20 kg (44 lb)	10-20 kg (22-44 lb)	< 10 kg (< 22 lb)	
Airway	Patent *	Maintainable ^	Unmaintainable #	
Systolic (cuff) Or BP (pulses)	> 90 mm Hg Radial	50-90 mm Hg Femoral/Carotid	< 50 mm Hg None palpable	
CNS	Awake, no LOC	Obtunded Some LOC†	Comatose, unresponsive	
Fractures	None	Closed (or suspected)	Multiple open or closed	
Wounds	None	Minor	Major ‡, Burns or penetrating	
<b>TOTAL</b>	<b>Range – 6 to +12</b>			

Score: Possible Range –6 to +12, decreasing with increasing injury severity.

Generally:

- 9 to 12 = minor trauma
- 6 to 8 = potentially life threatening
- 0 to 5 = life threatening
- < 0 = usually fatal

\* No assistance required.

^ Protected by patient but constant observation required for position, patency, or O<sub>2</sub> administration

# Invasive techniques required for control (e.g., intubation).

† Responds to voice, pain, or temporary loss of consciousness.

‡ Abrasions or lacerations

# ADULT INTERFACILITY TRIAGE AND TRANSFER GUIDELINES Oklahoma Model Trauma Triage Algorithm

## PRIORITY I

### Anatomy of the Injury

Penetrating injury of the head, neck, torso or groin.

### Abdominal/Pelvic Injuries

- Hemodynamically unstable patient with physical evidence of abdominal or pelvic trauma
- Unstable pelvic ring disruption
- Pelvic fracture with shock or other evidence of continuing hemorrhage
- Open pelvic fracture
- Penetrating wound of abdomen with suspicion of penetration of the peritoneum
- Ruptured hollow viscous

### CNS

- Penetrating Head Injury or Depressed skull fracture
- Open Head Injury
- GCS  $\leq$  10 or deterioration of 2 or more points
- Lateralizing signs
- New neurological deficits
- CSF Leak
- Spinal cord injury with neurological deficits
- Unstable spinal cord injuries

### Chest

- Widened mediastinum or other signs suggesting great vessel injury
- Major chest wall or pulmonary injury with respiratory compromise
- Cardiac injury (blunt or penetrating)
- Cardiac tamponade
- Patients who may require prolonged ventilation
- Suspected tracheobronchial tree or esophageal injury

### Hemodynamic Instability

- Adult SBP consistently  $<90$  following 2 liters of crystalloid
- Respiratory distress with rate  $<10$  or  $>29$

### Major Extremity Injury

- Fracture/dislocation with loss of distal pulses
- Amputation of extremity proximal to wrist or ankle
- Pelvic fractures with hemodynamic instability
- Two or more long bone fracture sites
- Major vascular injuries documented by arteriogram or loss of distal pulses
- Crush Injury or prolonged extremity ischemia

### Multiple System

- Head Injury combined with face, chest, abdominal, or pelvic injury
- Significant injury to two or more body regions
- Combination of burns  $>10\%$  or significant burns involving face, airway, hands, feet or genitalia *without* significant trauma transport to regional Burn Center. Burns  $>10\%$  *with* significant trauma transport to trauma center.

### Secondary Deterioration

- Prolonged mechanical ventilation
- Sepsis
- Single or multiple organ system failure (deterioration in CNS, cardiac, pulmonary, hepatic, renal or coagulation systems)
- Major tissue necrosis

**YES**

Initiate internal Trauma Treatment Protocol if definitive surgical care and critical care monitoring are available

If definitive surgical care or critical care monitoring are not available then immediate stabilization & transfer to appropriate designated facility according to regional plan. Stabilization may involve surgical intervention prior to transfer. Air transport may be necessary considering time & distance constraints.

**NO**

Proceed to Priority II Interfacility Transfer Criteria



**ADULT INTERFACILITY  
TRIAGE AND TRANSFER GUIDELINES  
Oklahoma Model Trauma Triage Algorithm**

**PRIORITY II**

**Abdominal/Pelvic Injuries**

- Stable pelvic fractures
- Hemodynamically stable isolated abdominal trauma
  - o diffuse abdominal pain/tenderness
  - o seat belt contusions
  - o visceral injuries
- Hemodynamically stable isolated solid organ injuries

**CNS**

- Head Injury with GCS > 10
- Head Injury with Transient loss of consciousness < 5 min
- Head Injury with Transient neurological deficits
- Spinal cord injury without neurological deficits

**Chest**

- Isolated Chest Trauma- pain, mild dyspnea
- Rib fractures, sternal fractures, pneumothorax, hemothorax without respiratory compromise
- Unilateral pulmonary contusion without respiratory compromise

**Comorbid**

- Age <5 or > 55
- Known cardiac, respiratory or metabolic disease
- Pregnancy
- Immunosuppression
- Bleeding disorder or anticoagulants

**Major Extremity Injury**

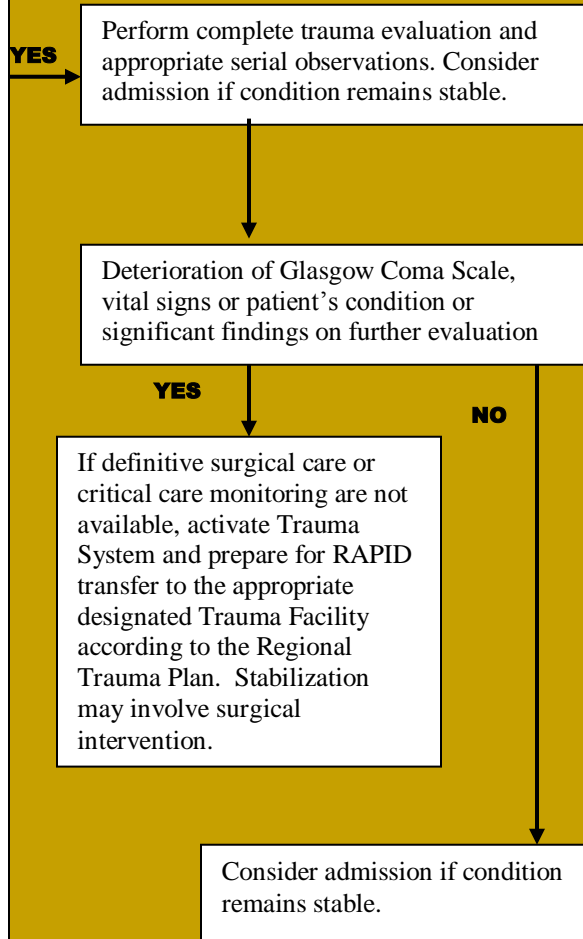
- Single proximal extremity fractures, including open
- Distal extremity fractures, including open
- Isolated joint dislocations-knee, hip, elbow, shoulder without neurovascular deficits
- Unstable joint (ligament) injuries without neurovascular deficits
- Degloving injuries without evidence of limb threatening injury

**Mechanism**

- Ejection of patient from enclosed vehicle
- Adult auto/pedestrian, auto/bike, or motorcycle crash with significant impact and patient thrown or run over by vehicle
- Falls greater than 20 feet
- Significant assault or altercations
- Other “high energy” events based on Paramedic discretion, e.g.: patients involved in motor vehicle crashes with significant vehicular damage and not using personal safety restraint devices

**Other**

- Isolated open facial fractures
- Isolated orbit trauma with or without entrapments, without visual deficits



**NO**

**Priority III**

Perform appropriate emergency department evaluation. Consider discharge or admit if condition remains stable.

Deterioration of Glasgow Coma Scale, vital signs or patient's condition or significant findings on further evaluation: Initiate Trauma Treatment Protocol- Activate Trauma System and prepare for RAPID transfer to the appropriate designated Trauma Facility according to the Regional Trauma Plan if definitive surgical care and critical care monitoring are not available.

# Pediatric Interfacility Triage and Transfer Guidelines Oklahoma Model Triage Algorithm

## PRIORITY I

### Anatomy of the Injury

Penetrating injury of the head, neck, torso or groin.

### Abdominal/Pelvic Injuries

- Hemodynamically unstable patient with physical evidence of abdominal or pelvic trauma
- Unstable pelvic ring disruption
- Pelvic fracture with shock or other evidence of continuing hemorrhage
- Open pelvic fracture
- Penetrating wound of abdomen with suspicion of penetration of the peritoneum
- Ruptured hollow viscous

### CNS

- Penetrating Head Injury or Depressed skull fracture
- Open Head Injury
- GCS  $\leq$  10 or deterioration of 2 or more points
- Lateralizing signs
- New neurological deficits
- CSF Leak
- Spinal cord injury with neurological deficits
- Unstable spinal cord injuries

### Chest

- Widened mediastinum or other signs suggesting great vessel injury
- Major chest wall or pulmonary injury with respiratory compromise
- Cardiac injury (blunt or penetrating)
- Cardiac tamponade
- Patients who may require prolonged ventilation
- Suspected tracheobronchial tree or esophageal injury

### Hemodynamic Instability

- SBP consistently  $<90$  following 20cc/kg of resuscitation fluid
- Respiratory distress with rate of:
  - Newborn:  $< 30$  or  $> 60$
  - Up to 1 yr  $< 24$  or  $> 36$
  - 1-5 yr  $< 20$  or  $> 30$
  - Over 5 yr  $< 15$  or  $> 30$

### Major Extremity Injury

- Fracture/dislocation with loss of distal pulses
- Amputation of extremity proximal to wrist or ankle
- Pelvic fractures with hemodynamic instability
- Two or more long bone fracture sites
- Major vascular injuries documented by arteriogram or loss of distal pulses
- Crush Injury or prolonged extremity ischemia

### Multiple System

- Head Injury combined with face, chest, abdominal, or pelvic injury
- Significant injury to two or more body regions
- Combination of burns  $> 10\%$  or significant burns involving face, airway, hands, feet or genitalia *without* significant trauma transport to Hillcrest Burn Center or OUMC Children's Hospital. Burns  $>10\%$  *with* significant trauma transport to trauma center

### Secondary Deterioration

- Prolonged mechanical ventilation
- Sepsis
- Single or multiple organ system failure (deterioration in CNS, cardiac, pulmonary, hepatic, renal or coagulation systems)
- Major tissue necrosis

Pediatric Trauma Score  $\leq 5$

**YES**

Initiate internal Trauma Treatment Protocol if definitive surgical care and critical care monitoring are available

If definitive surgical care or critical care monitoring are not available then immediate stabilization & transfer to appropriate designated facility according to regional plan. Stabilization may involve surgical intervention prior to transfer. Air transport may be necessary considering time & distance constraints.

**NO**

Proceed to Priority II Interfacility Transfer Criteria

