

Region 7

Trauma Plan



Developed by the Tulsa RTAB Regional Planning Committee

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Introduction

I. **Goals and Purpose**

- A. Assure trauma patients are transported to the most appropriate hospital with the capability and capacity to provide care in a timely fashion
- B. Reduce trauma morbidity and mortality through utilization of predetermined Pre-Hospital Trauma Triage and Transport Guidelines.
- C. Ensure the provision of optimal and cost effective trauma care by matching each trauma patient's needs to the appropriate facility
- D. This plan is not intended to conflict with any rules currently in place or that may be written or amended by the Oklahoma State Department of Health or recognized entity thereof. Future revisions or additions to rules that are recognized by the OSDH Trauma Division will supersede this plan where conflict would otherwise occur.

II. **Region Description**

Region 7 consists of Tulsa County and portions of adjacent counties that are served by Region 7 ground ambulance services. Region 7 contains:

EMS Agencies

Eight ground services

One Helicopter service located in Tulsa County

One Fixed Wing service located in Tulsa County

There are three additional Helicopter services in surrounding regions.

Hospitals

No Level 1 Trauma hospitals

Two Level 2 Trauma hospitals

Four Level 3 Trauma hospitals

Two Level 4 Trauma hospitals

Eight Trauma Level Not Classified

Four Psychiatric Hospitals

III. **Trauma Priority Categorization**

All injured patients must be identified and transported/transferred to the facility capable of providing the appropriate care based on the clinical needs of the patient. This should be done in a timely fashion with specific attention focused on preserving the highest level of care for major trauma patients. A three tiered system designed to determine the appropriate hospital destination for all injured patients considers injury severity, severity risk, time and distance from injury to definitive care, and available resources to meet the region's specific needs.

Three trauma triage priorities are used in determining the appropriate destination for patients.

A. Priority 1 Trauma Patients

These are patients with blunt or penetrating injury causing physiological abnormalities or significant anatomical injuries. These patients have time sensitive injuries requiring the resources of a Level I or Level II Trauma Center. These patients should be directly transported to a Level I or Level II 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.

B. Priority 2 Trauma Patients

These patients may have potentially time sensitive injuries due to a high-energy event or single system injury. These patients do not have physiological abnormalities or significant anatomical injuries and can be transported to a trauma facility with the resources to perform a complete trauma evaluation and medical screening . The determination of the Level of care required will be based upon identified injuries and facility resources.

C. Priority 3 Trauma Patients

These patients are without physiological instability, altered mentation, neurological deficit, or significant anatomical or single system injury *and have generally* been involved in a low energy event. These patients should be treated at the closest facility or the patient's hospital of choice.

IV. Categorization of Hospitals

Region 7 Hospital Providers

1. Level I – none

2. Level II

Saint Francis Hospital

Saint John Medical Center, Inc.

3. Level III

Hillcrest Medical Center

Oklahoma State University Medical Center

Saint Francis- South

South Crest Hospital

4. Level IV

Bailey Medical Center

Saint John – Owasso

5. Trauma Level Not Classified

Continuous Care Center of Tulsa

Hillcrest Specialty Hospital

MeadowBrook Specialty Hospital of Tulsa

Select Specialty Hospital – Tulsa

Southwest Regional Medical Center

Tulsa Spine & Specialty Hospital

Oklahoma Neurospecialty Hospital

Oklahoma Surgical Hospital

6. Psychiatric Hospitals
 - Parkside
 - Brookhaven Hospital
 - Laureate Psychiatric Clinic and Hospital
 - Shadow Mountain Behavioral Health System

V. **Description of EMS Services**

Region 7 encompasses Tulsa County and portions of adjacent counties served by ground ambulance providers located within Region 7.

1. Ground Ambulance Services:
 - Broken Arrow Fire Department EMS
 - Collinsville Ambulance Service
 - EMS Plus, LLC – Broken Arrow
 - EMSA – East Division
 - Integrity EMS (Substation in Broken Arrow)
 - Mercy Regional of Oklahoma (Owasso)
 - Owasso Fire Department EMS
 - Skiatook Ambulance
2. Helicopter Ambulance Services:
 - Tulsa Life Flight
 - Three additional services routinely transport into the region
3. Fixed Wing Services:
 - Aerocare Medical Transport

Prehospital Component

I. Procedure for Selection of Hospital Destination

Rapid pre-hospital evaluation and appropriate triage of trauma patients using the Oklahoma Model Trauma Triage and Transport Guidelines is essential in determining the appropriate hospital destination for all priorities of trauma patients (see appendix A). The appropriate resources for the optimal care of the injured patient may not be available at the closest facility or at the facility of the patient's preference. Transport to a facility with the appropriate capabilities should occur in a timely manner.

All Patients

All trauma patients should be rapidly transported to the closest medical facility with the capability and capacity to provide the appropriate level of care as indicated by the patient's injury type and severity.

Patients whose airway cannot be secured by pre-hospital personnel should be transported to the closest trauma designated facility.

Patient preference as well as time and distance for transport will be considered when triaging most Priority 2 and 3 patients.

Region 7 Trauma Patients:

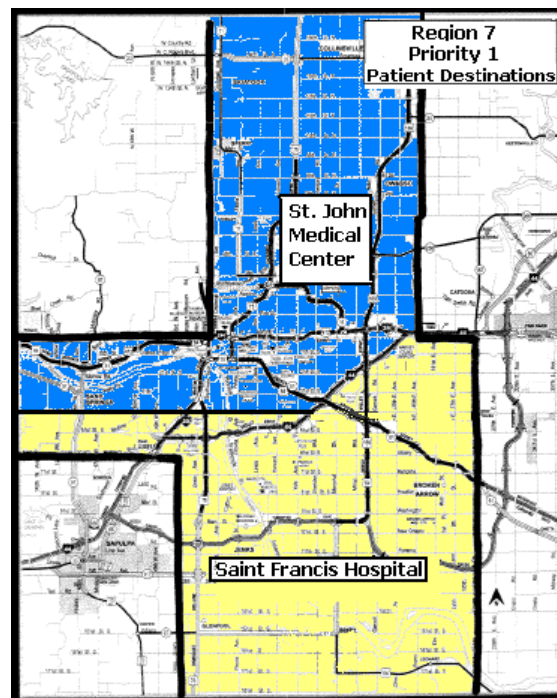
Adult Trauma Patients

Priority 1

Adult patients meeting state approved Priority 1 trauma criteria should be transported to a level II or higher trauma facility based on geographic location, see map.

Priority 2 patients meeting the state approved Priority 2 criteria should be transported to the closest appropriate Level III or higher trauma facility (see section IV, categorization of hospitals).

Priority 3 adult trauma patients should be transported to the facility of patient preference or the closest trauma designated facility. (See Section IV Categorization of Hospitals)



Pediatric Trauma Patients

All **Priority 1 & 2** pediatric trauma patients (unless there is airway compromise) should be transported to Saint Francis Hospital.

Priority 3 pediatric trauma patients should be transported to the facility of patient preference or the closest trauma designated facility (see section IV, Categorization of Hospitals).

Patients from Outside Region 7:

Undesignated **Priority 1 adult** trauma patients coming into region 7 should be transported to a level II or higher trauma designated facility based upon the pre-determined destination rotation in appendix B.

Undesignated **Priority 2 adult** trauma patients coming into region 7 should be transported to the closest Level III or higher Trauma facility (see section IV, Categorization of Hospitals).

Undesignated **Priority 3 adult** trauma coming into region 7 should be transported to the designated trauma facility of the patient preference or to the closest available designated trauma facility (see section IV, Categorization of Hospitals).

All undesignated **Priority 1 & 2 pediatric** trauma patients coming into region 7 should be transported to Saint Francis Hospital unless there is airway compromise.

Undesignated **Priority 3 adult and pediatric** trauma patients should be transported to the designated trauma facility of patient preference or the closest trauma designated facility (see section IV, Categorization of Hospitals)

All Burn Patients:

Adult:

Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia *without* significant trauma transport to regional Burn Center (Hillcrest Medical Center). Burns >10% *with* significant trauma transport to trauma center (Saint Francis Hospital or St. John Medical Center) (Change 5-15-2009 to match T3 Clarifications).

Pediatric

Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia *without* significant trauma transport to Hillcrest Burn Center. Burns >10% *with* significant trauma transport to trauma center (Saint Francis Hospital or St. John Medical Center) (Change 5-15-2009 to match T3 Clarification).

Tulsa Regional Trauma Triage and Destination Plan

Priority 2 trauma patients with Priority 1 burn injuries will be transported directly to Hillcrest Burn Center.

II. Helicopter Utilization Protocol

A. Purpose

To Define appropriate utilization of air ambulance resources by Region 7 providers

B. 'No Fly' Conditions

Helicopter utilization is seldom indicated for patients without signs of life, physiological compromise, or serious injury. Air Transport is generally not indicated for:

1. Patient with stable vital signs and without evidence of a serious injury (Priority 3).
2. Cardiac arrest without return of spontaneous circulation in the field.
3. Distances less than 20 miles or 15 minutes by air from the appropriate destination based on the destination guidelines in section VII of this document.

C. 'Fly' Conditions

1. Priority 1-trauma patients being transported to a facility in Region 7 who are located more than 20 miles or 15 minutes by air from that destination.
2. Priority 1 or 2 patients involved in a high-energy event with a prolonged extrication time.
3. Priority 1 or 2 patients may be transported by air if ground transportation will result in an unsafe delay in transport time.
4. The closest available medical helicopter will be utilized unless specific indications for the use of another service are identified.
5. If the ETA of the aircraft is less than 15 minutes the responders should generally remain on scene. When the ETA is greater than 15 minutes the responders should generally proceed to the closest pre-existing landing area (PELA site) or to the nearest treating facility if the patients condition warrants immediate intervention.

D. Early Activation / Standby

A dispatch center or ground ambulance service receiving a call meeting the following criteria, should place the nearest appropriate air ambulance service on standby or 'early activation': (1) Significant mechanism of injury as defined in the Oklahoma Pre-hospital Triage and Transport Guidelines, (2) Multiple patients, (3) Other situations the dispatcher or responders determine to potentially warrant air transport.

E. Landing Zone

A landing zone meeting parameters established by the responding air service should be determined.

III. Diversion

Priority 1

In the event that any level II or higher trauma facility is on a divert status effecting the acceptance of adult trauma patients the unaffected facility will become the destination for the Priority 1 trauma patients that would normally be transported to the diverting facility.

In the event that all level II or higher trauma facilities are on a divert status effecting the acceptance of adult trauma patients those facilities will rotate receiving Priority 1 adult trauma patients.

Priority 2 Trauma Patient Divert - In the event that a designated Priority 2 facility is on a divert status effecting the acceptance of adult trauma patients the unaffected facilities will rotate receiving trauma patients that would normally be transported to the diverting facility.

Priority 3 Trauma Patient Divert – in the event that a Priority 3 destination facility is on a divert status effecting the acceptance of trauma patients the unaffected priority 3 destination facilities will rotate receiving trauma patients that would normally be transported to the diverting facility.

Facilities may be “forced open” to meet emergent need within the region. Facilities that are “forced open” may not be required to accept undesigned requests for transfer from other hospitals.

Pediatric Trauma Patient Divert - Saint Francis Hospital will not go on divert for Priority 1 or 2 Pediatric Trauma Patients except in the event of internal disaster. Should Saint Francis Hospital be unable to accept Priority 1 or 2 pediatric trauma, those patients should be transported to another level II or higher trauma facility for stabilization and transfer.

INTER-FACILITY TRAUMA TRANSFER COMPONENT FOR REGION 7

(Developed by the RTAB SW Regional Planning Committee and modified and incorporated, with thanks, by Tulsa Regional Planning Committee under the auspices of don't reinvent the wheel).

- I. GOALS / PURPOSE: Refer to Page 2**
- II. REGION DESCRIPTION: Refer to Page 2**
- III. TRAUMA PRIORITY CATEGORIZATION: Refer to Page 2**
- IV. CATEGORIZATION OF HOSPITALS**
 - Region 7 Hospital Providers
 - 1. Level I – none
 - 2. Level II
 - Saint Francis Hospital
 - Saint John Medical Center, Inc.
 - 3. Level III
 - Hillcrest Medical Center
 - Oklahoma State University Medical Center
 - Saint Francis- South
 - South Crest Hospital
 - 4. Level IV
 - Bailey Medical Center
 - Saint John – Owasso
 - 5. Trauma Level Not Classified
 - Continuous Care Center of Tulsa
 - Hillcrest Specialty Hospital
 - MeadowBrook Specialty Hospital of Tulsa
 - Select Specialty Hospital – Tulsa
 - Southwest Regional Medical Center
 - Tulsa Spine & Specialty Hospital
 - Oklahoma Neurospecialty Hospital
 - Oklahoma Surgical Hospital
 - 6. Psychiatric Hospitals
 - Parkside
 - Brookhaven Hospital
 - Laureate Psychiatric Clinic and Hospital
 - Shadow Mountain Behavioral Health System

V. TRAUMA CENTER PROGRAM

In accordance with O.A.C. 310:667, each hospital will have a designated Trauma Team that is appropriate for the level of care for which the hospital is licensed. It is important to incorporate all facilities in trauma planning and implementation, as well as, in the planning of transfer protocols.

The minimum requirements for licensed hospitals in Oklahoma for Trauma and Emergency Clinical Services, Resources and personnel are defined in the Hospital Standards, Oklahoma Administrative Code 310:667-59-9.

In general the Level III Trauma Center is expected to provide initial resuscitation of the trauma patient and immediate operative intervention to control hemorrhage and to assure maximal stabilization prior to transfer to a higher level of care institution. In many instances, patients should remain in the Level III trauma center unless the medical needs of the patient require secondary transfer. The decision to transfer should rest with the physician attending the trauma patient and all Level III centers should work collaboratively with other trauma facilities to develop transfer protocols and a well-defined transfer sequence.

In general the Level IV Trauma Center is a licensed, facility with a commitment to the resuscitation of the trauma patient and written transfer protocols in place to assure those patients needing a higher level of care are transferred appropriately. The major trauma patient in this facility should be stabilized and transported to the most appropriate facility for the patients on-going care needs.

VI. TRAUMA TEAM

The team approach is optimal in the care of the severely injured patient. The trauma center should have a written policy for notification and mobilization of an organized trauma team (in a Level III facility) or to the extent that one is available (Level IV facility). The Trauma Team may vary in size and composition when responding to trauma activation. The physician leader or the mid-level practitioner on the trauma team should be ATLS or equivalent trauma trained and is responsible for directing all phases of the resuscitation in accordance with ATLS protocol.

VII. TRAUMA HOSPITAL TRIAGE AND TRANSFER PLAN

A well-designated trauma program within the hospital is crucial to the success for providing optimal care to the trauma patient in Region 7. A commitment on behalf of the entire facility devoted the organization of trauma care is vital. Therefore, all hospitals in the region should establish criteria for the activation of their respective trauma programs and these criteria should be clearly defined in each institutions trauma policy.

VIII. CRITERIA FOR ACTIVATION OF THE TRAUMA TEAM

Appropriate activation of the trauma system should occur when you have any of the following:

- A. Glasgow Coma Scale (GCS) < 10
- B. Systolic blood pressure < 90 mmHg
- C. Respiratory rate < 10 or > 30/min
- D. Penetrating injury to the head, neck, torso, or extremities above the elbows or knees
- E. Flail chest
- F. Two or more proximal long bone fractures
- G. Pelvic fracture
- H. Limb paralysis
- I. Amputation proximal to the wrist or ankle
- J. Body surface burns > 5% (second or third degree)
- K. Burns associate with other traumatic or inhalation injury
- L. Trauma transfer patient that is intubated or receiving blood
- M. Children under 12 with any of the following criteria
 - 1. Ejection from vehicle
 - 2. Death of same passenger compartment
 - 3. Extrication time greater than 20 minutes
 - 4. Rollover MVC
 - 5. High-speed auto crash greater than 40 mph
 - 6. Auto deformity greater than 20 inches of external damage or intrusion into passenger compartment greater than 12 inches
 - 7. Pedestrian thrown or run over
 - 8. Motorcycle crash greater than 20 mph or separation of rider from the bike.

IX. INTER-FACILITY TRANSFERS

- A. In an effort to optimize patient care and deliver the trauma patient to most appropriate destination, rapid assessment of the patient is imperative. When a trauma patient arrives at a hospital the trauma team should be activated and the patient will have an immediate medical screening completed. Depending upon the screening and the needs of the patient appropriate treatment and/or transfer will be arranged.
- B. It is recommended that the transfer of trauma patients follow the same routing as the Pre-Hospital Destination Plan. This is an effort to provide optimal care in the most appropriate amount of time for the trauma patient. As always, the patient's choice of facility should be considered when the injuries are not of a time sensitive matter.

X. DESCRIPTION OF EMS SERVICES: Refer to Page 4

XI. TRAUMA Referral CENTER (TReC)

The Trauma Transfer and Referral Centers were created by statute (Senate Bill 1554, 2004) and they were implemented on July 1, 2005. The purpose of these centers is to ensure that trauma patients transported or transferred to facilities in Region 7 are transported to the facility that provides the appropriate level of care based on the clinical needs of the patient. This should be done in a timely fashion with specific attention focused on preserving the highest level of care for major trauma patients. Contact information for TReC is located in Appendix C.

XII. PROCEDURE FOR SELECTION OF HOSPITAL DESTINATION:

Refer to page 5

XIII. HELICOPTER UTILIZATION PROTOCOL: Refer to page 7

XIV. DIVERSION: Refer to Page 8

Communication Component

I. Trauma Referral Center (TReC)

As required by Oklahoma Statute, the Trauma Referral Center (TReC) was implemented in Region 7 on July 1, 2005. The purpose of the center is to:

- A. Ensure the timely transport or transfer of trauma patients to facilities in Region 7 providing the appropriate level of care based on the clinical need of each patient transferred or transported.
- B. Preserve and insure the availability of the highest level or resource for major trauma patients through optimal utilization of all resources within the region.

Ambulances transporting a trauma patient into region 7 are required to contact the TReC to ensure appropriate destination. Hospitals referring a trauma patient into Region 7 may call the TReC for assistance in identifying the appropriate destination.

The TReC will provide data on resource utilization to the Oklahoma State Department of Health. The data will be reported to the RTAB periodically for educational and QI purposes.

Ambulances operating within Region 7 will either:

- 1. Report each trauma transport to the TReC at its completion, or
- 2. Report monthly cumulative data to the Trauma Transfer and Referral Center. Data reported must be complete by the 15th of the month following each transport.

II. PROCEDURE FOR MONITORING HOSPITAL STATUS AND CAPABILITY

A. EMResource™

The Regional Administrator should generate reports from the EMResource™ for use in monitoring hospital status related to destination. These reports should be provided monthly to the OSDH and the Region 2/4/7 CQI Committee. Issues identified through review of the EMResource™ reports should be addressed by the QI Committee directly with the provider and if necessary through referral to the appropriate state level committee.

B. QI Indicators

QI indicators for use statewide have been developed by the statewide CQI Subcommittee for use in monitoring hospital status and appropriateness of destination. The Region 2/4/7 CQI Committee should monitor these indicators. Issues identified through review of the indicators should be addressed by the QI Committee directly with the provider and if necessary through referral to the appropriate state level committee.

Appendix A

Oklahoma Trauma Patient Definitions and Triage Algorithms

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 Compromise¹-Systolic BP < 90mmHg
Or signs that should be considered include:
 - Sustained tachycardia
 - Cool diaphoretic skin
- Respiratory Compromise²- RR < 10 or > 29 breaths/minute
or < 20 in infant < 1 yr
- Altered Mentation of trauma etiology³- 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.⁴

- 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 crash⁵
- 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 ↓

CONSIDER⁶ Co-morbid factors
-Gestalt-EMS clinical judgment

NO

PRIORITY III

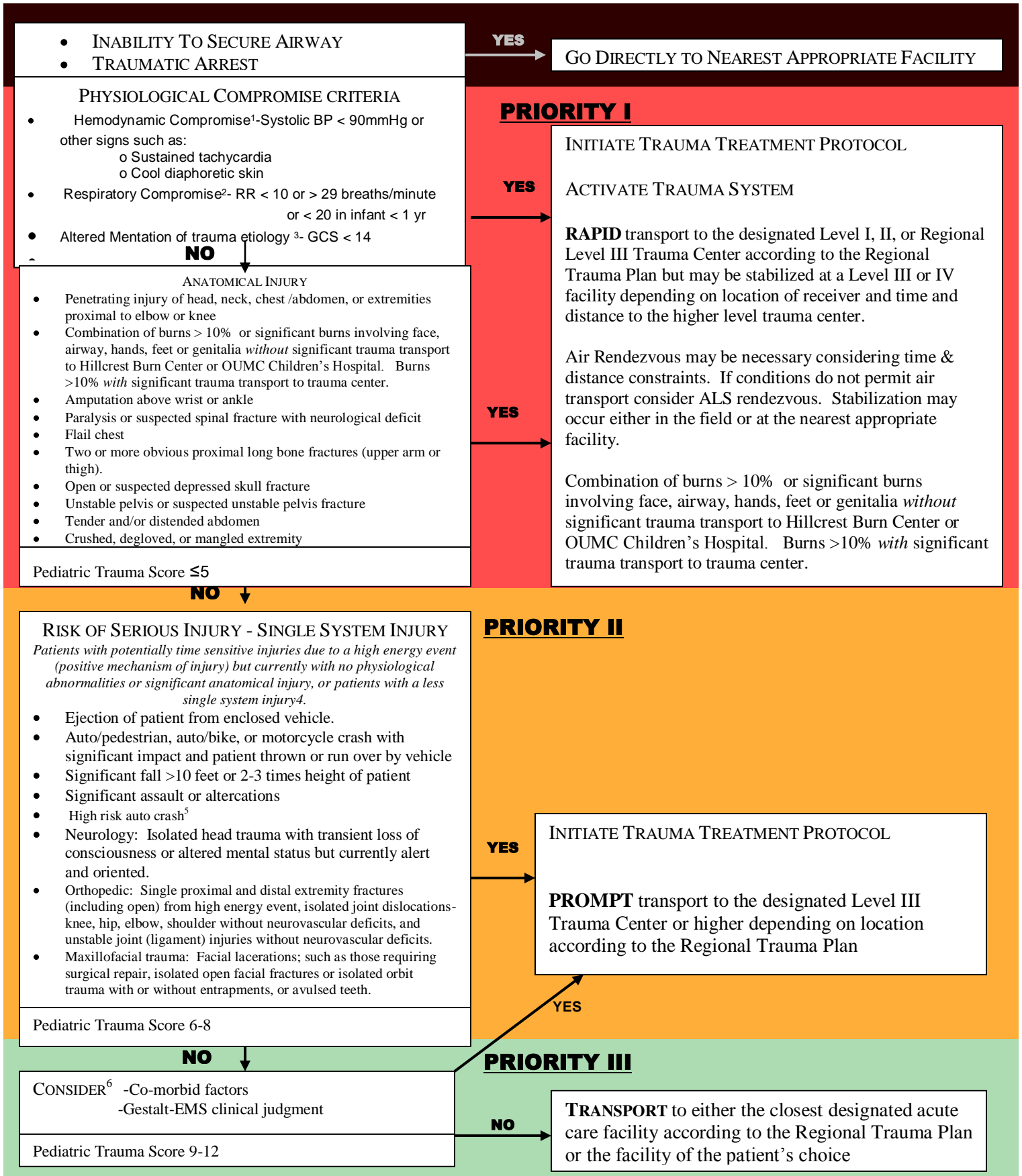
TRANSPORT to either the closest Level IV Trauma Center or higher depending on location according to the Regional Trauma Plan or the facility of the patient's choice

**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

Pediatric Trauma Score (PTS)				
Components	+2	+1	-1	Score
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	
TOTAL	Range – 6 to +12			

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 O₂ 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

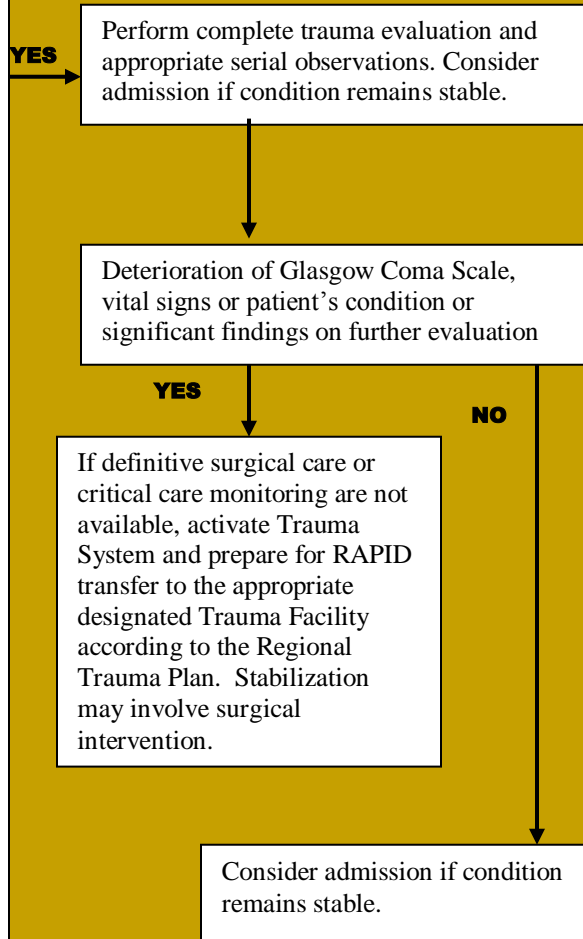
- Single proximal extremity fractures, including open
- Distal extremity fractures, including open
- Isolated joint dislocations-knee, hip, elbow, shoulder without neurovascular deficits
- Unstable joint (ligament) injuries without neurovascular deficits
- Degloving injuries without evidence of limb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

Pediatric Interfacility Triage and Transfer Guidelines Oklahoma Model 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

- 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

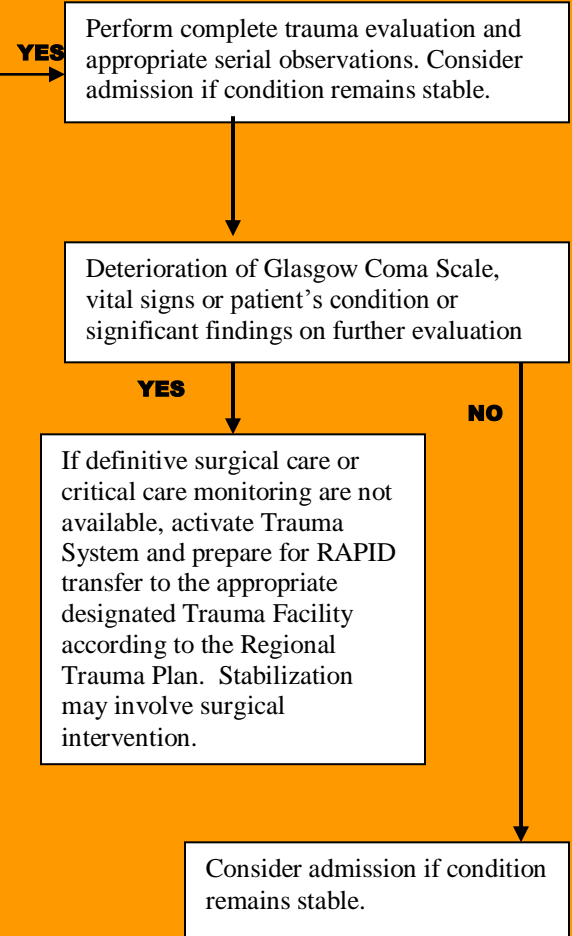
Mechanism

- Ejection of patient from enclosed vehicle
- 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

Pediatric Trauma Score 6-8



NO

Priority III

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

Pediatric Trauma Score 9-12

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.

Appendix B

Priority One Out of Region/ Patient Destination Rotation

Tulsa Regional Trauma Triage and Destination Plan

The Priority One out of region pre-hospital patient destination rotation is as follows:

1. On odd number days undesignated out of region Priority 1 trauma patients will go to Saint Francis Hospital
2. On even number days undesignated out of region Priority 1 trauma patients will go to Saint John Medical Center

The Priority Two out of region pre-hospital patient destination and TReC assisted Interfacility Rotation is as follows:

(This portion of the plan will be discussed further on March 4th, 2008 at Region 7 RPC and RTAB meetings. Approved on March 4, 2008)

1. On odd number days, undesignated out of region Priority II trauma patients will alternate between Saint Francis, Saint Francis-South and OSU-Medical Center. (5-21-2008).
2. On even number days, undesignated out of region Priority II trauma patients will alternate between Saint John Medical Center, Hillcrest Medical Center, and Southcrest Medical Center. (5-21-2008)

Appendix C

TReC Contact Information



Telephone

(888) 658-7262

or

(866) 778-7262

TReC assists EMS and Hospitals in:

- 1. Getting the injured patient to the right hospital for definitive care**
- 2. Facilitating Interfacility transfers**

Appendix C

Advanced Life Support Intercept Protocol

ALS INTERCEPT PROTOCOL FOR REGION 7

Purpose:

To provide guidelines to Emergency Medical Services personnel on when to request Advanced Life Support (ALS) assistance from neighboring ambulance services.

Policy:

The following will apply to ensure that BLS/ALS assistance requests are managed appropriately.

ALS Assist is defined as any request for an air or ground advanced life support unit to respond to and/or intercept with an EMS Unit for the purpose of providing an advanced level of patient care. A licensed Intermediate or Paramedic level of care should provide ALS Assist.

ALS Assist/intercept requests should be made in any situation where the EMS provider has determined that the patient may be unstable or has life-threatening injuries or illness. Medics should refer to the Oklahoma Trauma Triage and Transportation guidelines for classification of the patient.

Procedure:

1. Consideration must be given as to the location of the EMS unit, and anticipated location of intercept. The decision to request ALS should be made immediately.
2. The location of the intercept shall be decided as soon as possible.
3. Only if it is deemed to be in the best interest of the patient should the patient be transferred from a BLS unit to a ground ALS unit.
4. The ALS provider should be licensed at the Intermediate or Paramedic level or an Air Ambulance.
5. BLS and ALS personnel may elect to request air medical support based on the Regional Trauma Plan. BLS personnel need not wait for an assessment prior to requesting air medical support. Landing zone selection and security shall be coordinated with local resources. Transportation to the closest most appropriate medical facility shall not be inordinately delayed while waiting for air support.
6. A full verbal patient care report shall be given to the ALS personnel upon arrival and a full patient care report will be left with the patient at the hospital.