

OKLAHOMA

Triage, Transport and Transfer Guidelines

Approved by

*The Oklahoma State Trauma Advisory Council
Oklahoma Regional Advisory Councils
(July 26, 1996)*

*The Oklahoma Emergency Medical Services Advisory Council
(January 24, 1997)*

The Trauma Systems Division would like to thank the Triage, Transport, and Transfer Committee of the *Oklahoma State Trauma Advisory Council (OSTAC)* for their guidance and input regarding the modification of these guidelines for approval and distribution. The OSTAC is a multi-disciplinary statewide group of healthcare providers, including physicians, nurses, prehospital personnel, hospital administrators, fire service, and rehabilitation providers. The following OSTAC members serve on the committee:

Vanessa Brewington	representing the <i>Oklahoma Emergency Medical Technicians Association</i>
Larry Byars	representing consumers of services
Patti Davis	representing the <i>Oklahoma Hospital Association</i>
Emily Friedman, M.D.	representing the <i>American Association of Neurosurgeons</i>
Kim Holmes-Kenney, R.N.	representing the <i>American Association of Critical Care Nurses</i>
Bill Justice, NREMT-P	representing Fire/Rescue
Keith Khoo	representing the <i>Oklahoma Physical Therapy Association</i>
Ronny Lathrop	representing the <i>Oklahoma Rural Health Association</i>
John Sacra, M.D.	representing the <i>American College of Emergency Physicians</i>
John Stuemky, M.D.	representing the <i>Oklahoma Emergency Medical Services for Children Project</i>
Gwen Switzer, R.N.	representing the <i>Oklahoma Association of Rehabilitation Nurses</i>

Foreword

November, 1995

The Triage, Transport, and Transfer Committee of the *Oklahoma State Trauma Advisory Council* (OSTAC) reviewed triage guidelines utilized in various states along with guidelines developed by the American College of Surgeons (ACS) and the American College of Emergency Physicians (ACEP). The consensus of the committee was to adopt the guidelines set forth by the ACEP. The original guidelines have been modified slightly, with level I/II and III/IV guidelines remaining fully intact with the exception of numbers being used for the endnotes as opposed to symbols.

Several of the reasons the committee supports the ACEP guidelines are the flexibility and applicability to rural and urban areas, and the fact that the guidelines have been field tested in the Northeastern Oklahoma area for several years, thus validating their use for rural and metropolitan areas of Oklahoma.

Please note the guidelines do not employ numeric parameters for vital signs which may subsequently affect decision-making regarding patient flow. Vital signs alone do not provide a comprehensive clinical representation of the patient's injuries and physiologic response to the injuries. It is for this reason the field medic must combine vital signs and physical findings in order to determine need for a trauma center. For example, a 16 year-old female involved in a motor vehicle crash may present with a systolic blood pressure of 90 mmhg and no other obvious symptoms. Yet a 30 year-old male involved in the same crash may present as pale, diaphoretic, with a blood pressure of 100 mmhg; the latter patient is concluded to be demonstrating signs of shock and requires immediate intervention to correct his circulatory compromise. In other words, each patient has a unique physiologic response to trauma and should be evaluated as such. Seasoned field personnel are comfortable with this concept, yet a newly trained medic may rely on the numeric parameters without considering other physical signs. The appropriate use of the triage scheme can help to minimize unnecessary transfer; thus a 16 year-old with a blood pressure of 90 and no other obvious sign of injury can be held in the emergency department for serial observations. Should any sign of physiologic deterioration occur, the patient can then be transferred up the system according to the regional plan.

Provision of adequate education and training for field personnel will assist with the proper utilization of these guidelines and lead to appropriate transportation of the patient to the most suitable medical facility based on the patient's injuries. It will be necessary for each region to use the guidelines in conjunction with their regional trauma plan, which will predetermine the process for system activation and triage destination.

***ACEP Policy Statement
Guidelines for Trauma Care Systems***

***Appendix A
Page A-1***

Appendix A: Trauma Triage Algorithms

INTRODUCTION

Many areas of the country already have resources in place to provide appropriate trauma care. To provide optimal care of the seriously injured with maximum efficiency and minimal cost in terms of lives, disability, and dollars, these resources must be organized using a systems approach to plan for the rapid decisions required for initial treatment of all injured patients - an inclusive system. A proper systems approach requires a regional triage system with identified trauma centers capable of providing trauma care to major trauma patients. Patients must be identified and delivered or transferred based on a clinical need to the appropriate level of care in a timely fashion.

Triage is the classification of patients according to medical need. Since the majority of trauma deaths occur either before reaching the hospital or within four hours of arrival, prehospital and emergency department personnel must make rapid triage decisions based on pre-established system stands.

INCLUSIVE SYSTEM

A major deficiency in today's provision of trauma care is the lack of an inclusive system (Figure A-1). An optimal trauma care system is designed to care for *all* injured Patients with specific attention focused on major trauma patients.

Major trauma patients are those with either a severe injury or a risk for severe injury. A severe injury is one that could result in morbidity or mortality and is classically defined as an injury with an Injury Severity Score (ISS) of 16 or greater. On initial evaluation, these patients typically have abnormal vital signs or a significant anatomical injury. However, triage is often inexact due to patients' variable physiological responses to trauma. In some patients, minor injuries can result in morbidity or mortality due to the patient's age and/or co-morbid factors, and some patients may have a delayed physiological response to trauma.

Patients involved in a high-energy event are at risk for severe injury. Five to fifteen percent of these patients, despite normal vital signs and no apparent anatomical injury on initial evaluation, will have a severe injury discovered after full trauma evaluation with serial observations.

A continuum of services must be developed to provide preventive programs, prehospital care, acute care, and rehabilitation to all injured patients and to match resources with individual patient needs.

Current systems ("exclusive systems") often rely on overtriage to trauma centers and often an exaggerated and unnecessary response from trauma professionals. Such systems may cause over-treatment of certain patients, unnecessary expenses, burnout of participants, and under-utilization of certain health resources, including personnel. In spite of these excesses, such systems may still run the risk of not treating all injured patients, including not appropriately creating all major trauma patients. Under-triage runs the obvious risk of excluding some major trauma patients from receiving appropriate care. An inclusive system uses a tiered response to provide appropriate delivery, evaluation, and care for all patients, including the major trauma patient, in a cost-effective manner.

PATIENT IDENTIFICATION

One characteristic of an inclusive trauma system is patient triage designed to care for major trauma patients by matching patient severity to facility in a timely manner. A systems approach will consider injury severity, injury severity risk, time and distance from site of injury to definitive care, inter-hospital transfers

considering guidelines for immediate versus post-intervention transports, and factors that activate the regional system (Figure A-2).

Major trauma patient triage criteria should consider categories such as-

- Patients with multi-systems blunt or penetrating trauma and unstable vital signs,
- Patients with known or suspected anatomical injuries and stable or normal vital signs.
- Patients involved in a "high-energy" event with a risk for severe injury despite stable or normal vital signs.

Once identified, these patients should activate an appropriate Systems response. (Figure A-3).

Triage occurs at both the prehospital and hospital level.

CLINICAL JUDGMENT AND CONTINUOUS QUALITY IMPROVEMENT

Trauma triage algorithms should provide a basis for the establishment of protocols for patient identification, delivery decisions, and appropriate response of trauma systems and trauma centers for all major trauma patients in an inclusive care system. Their design should recognize the unique requirements of individual trauma systems as well as the importance of clinical judgment.

All trauma systems, through medical direction and continuous quality improvement, must individualize algorithms to provide optimal and cost effective care. The definition of unstable vital signs, significant anatomical injuries, and what constitutes a high-energy event is a decision best made by individual trauma systems. Individual trauma systems may choose to add, delete, upgrade or downgrade certain anatomical injuries or high-energy events based on outcome studies. Deviations from established protocols based on clinical judgment should be allowed but become an automatic filter for case review.

It is recognized that both off-line (prospective and retrospective) medical direction through regional advisory committees and on-line (concurrent) medical direction for individualized patient care will be essential.

As indicated in Figure A-4, the definition of patients with minor/moderate injuries might differ or change in a given trauma system. In general, clinical judgment may shift line A or line B to the left and include more patients in the major trauma category for patient delivery decisions or trauma system or trauma center activation.

Individual variations in trauma systems may occur due to differences in the maturity or needs of a particular system, including level of education and experience of professionals or unique characteristics such as demographics or geography. In general, continuous quality improvement may shift line A and/or line B either to the left or right based on outcome studies and the needs of a given trauma system. The close cooperation of all members of the trauma system will be required to appropriately establish the response of individual trauma systems in order to provide appropriate and cost effective care.

DESTINATION DECISIONS

Patient destination decisions will depend on the available resources in a given region. A plan should be designed utilizing designated trauma centers in adequate numbers and appropriate levels to meet the region's specific needs. Patients can then be delivered depending on need as well as time and distance from site of injury to definitive care.

DEFINING A "HIGH-ENERGY EVENT"

A high-energy event signifies a large release of uncontrolled energy. The patient is assumed injured until proven otherwise. Determinants to be considered by medical professionals are direction and velocity of impact, patient kinematics and physical size, and the residual signature or energy release (e.g., major vehicle damage). Age and co-morbid conditions are also important factors to be considered.

SUMMARY

A systems approach to the provision of trauma care, including appropriate guidelines for the triage of patients, is essential. The triage protocols should be reasonable and inclusive, considering such factors as time and distance to designated trauma centers and appropriate utilization of resources at these centers. In order for a systems approach to work, appropriate protocols, well thought out and supported by all members of the trauma system, should be in place and followed unless clinical judgment dictates a valid reason otherwise.

By combining triage algorithms with an appropriate quality improvement monitoring system, optimal and cost effective care can be provided. Continuous quality improvement and research are essential to evaluate the algorithms' applicability in a given trauma care system. The result should be protocols with the sensitivity to identify major injury yet specific enough to not overburden the system, allowing for optimal and cost-effective care using existing resources.

Figure A-1.
Inclusive system—All injured patients

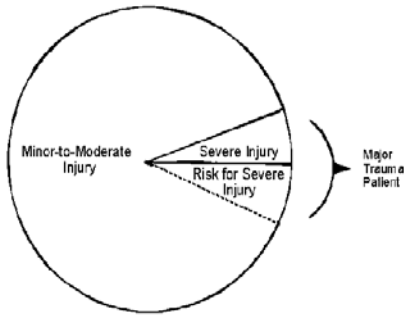


Figure A-2.
Injury severity risk

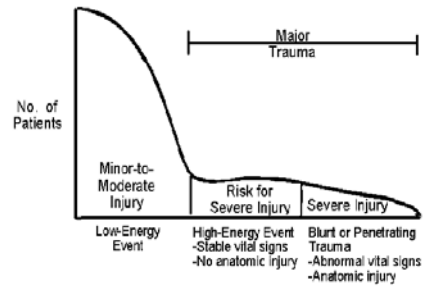


Figure A-3.
Triage decisions

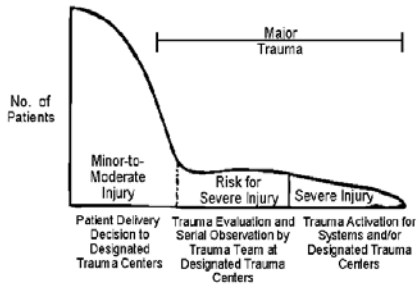
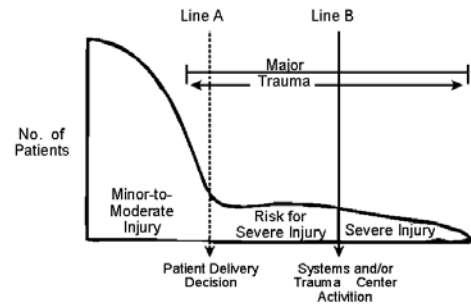


Figure A-4.
Definition of level of injury

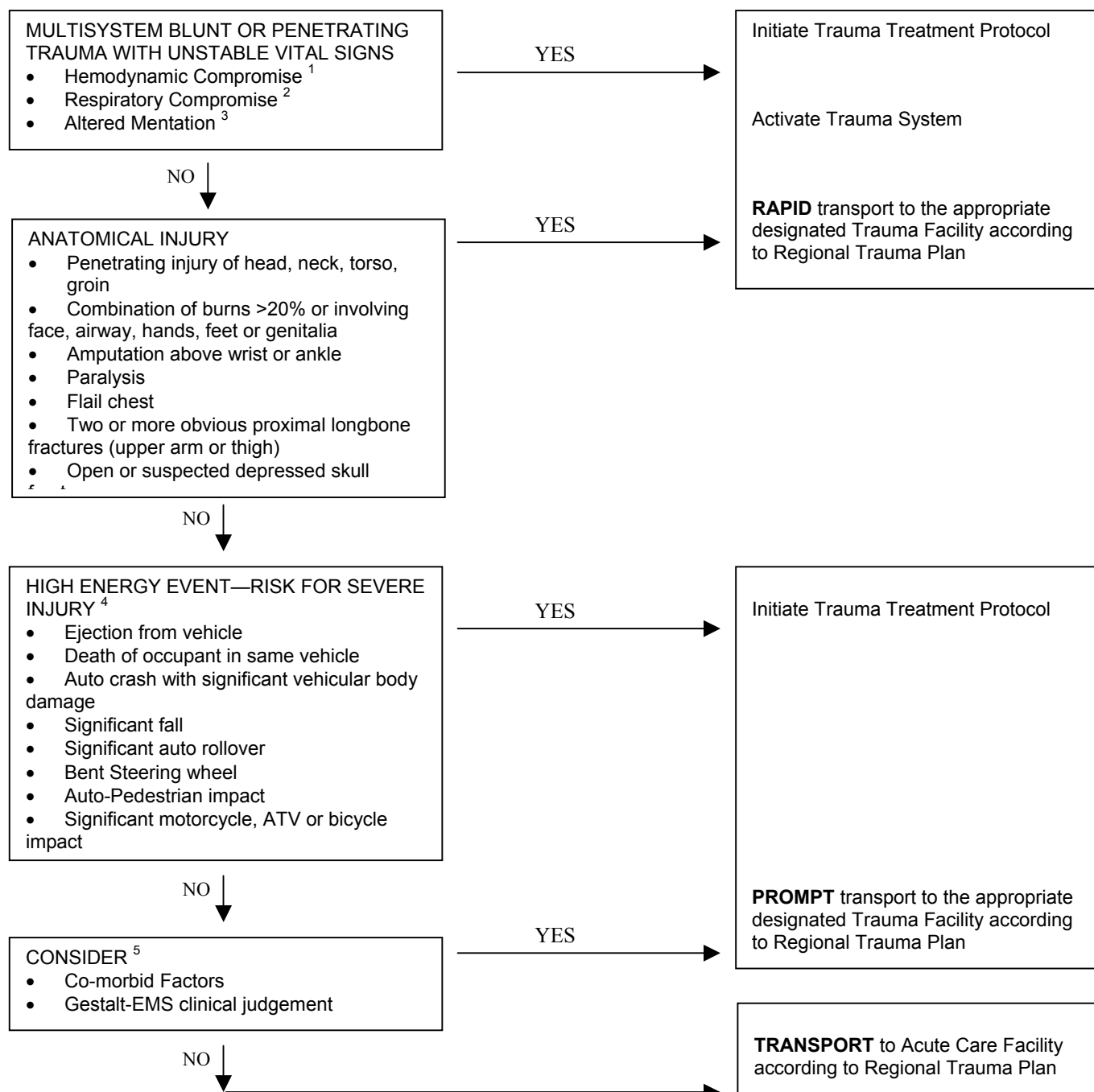


ADULT TRIAGE, TRANSPORT AND TRANSFER GUIDELINES

Oklahoma* Model Trauma Triage Algorithm

-Prehospital-

*Prepubescent patients, refer to **Pediatric 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 might exist. Determinants to be considered by medical professionals are direction and velocity of impact, patient kinematics and physical size, and the residual signature of energy release (e.g. Major vehicle damage).

5. Clinical judgement must be exercised and may upgrade to a high level of response and activation. Age and co-morbid conditions should be considered in the decision.

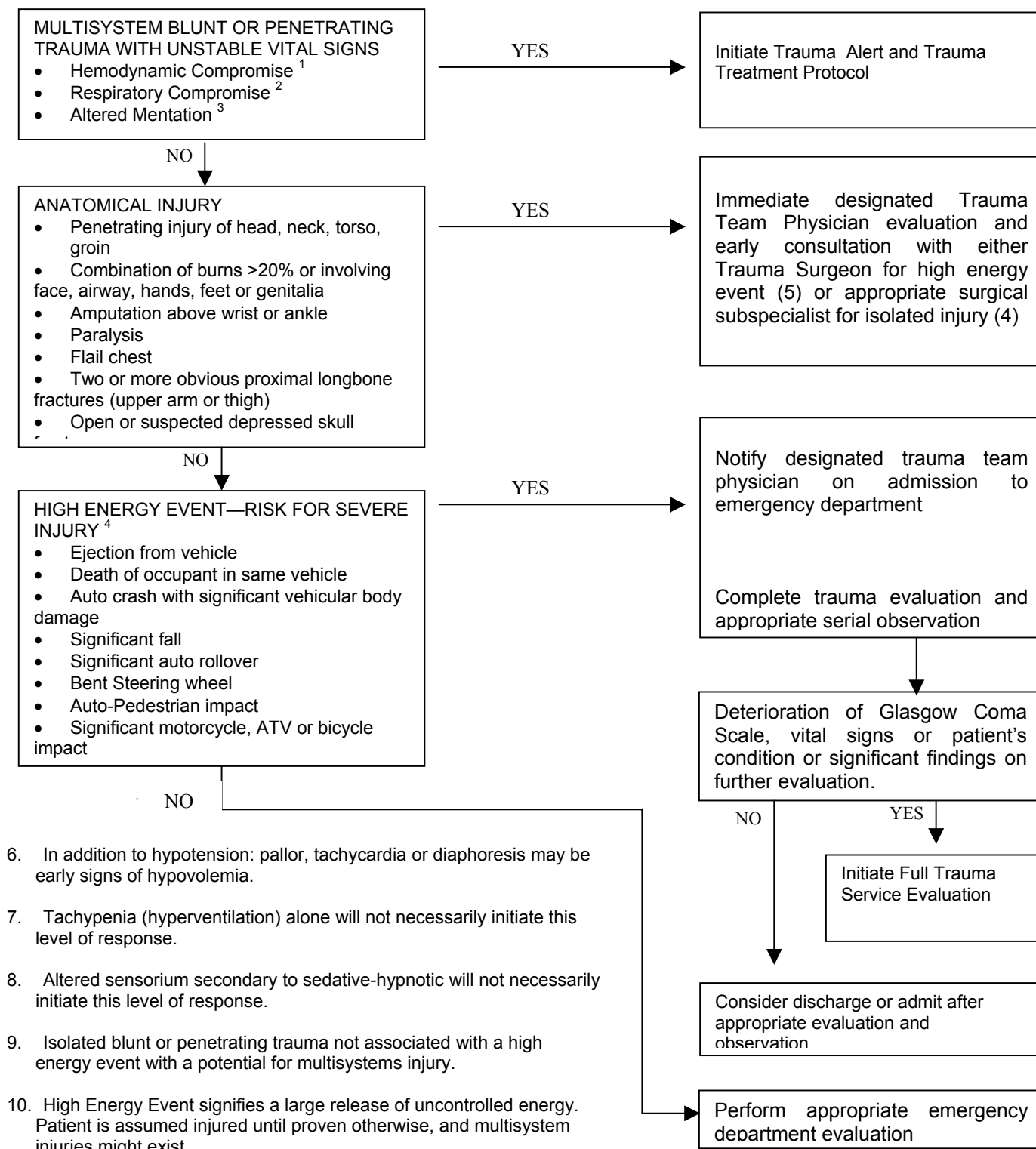
*Based on American College of Emergency Physicians Guidelines. Approved by the Triage, Transport, and Transfer Committee of the *Oklahoma State Trauma Advisory Council*, October 27, 1995, and the *Oklahoma Emergency Medical Services Advisory Council* on January 24, 1997.

ADULT TRIAGE, TRANSPORT AND TRANSFER GUIDELINES

Oklahoma*Model Trauma Triage Algorithm

-Level 1/II Trauma Center-

*Prepubescent patients, refer to **Pediatric Trauma Triage Algorithm**



Determinants to be considered by medical professionals are direction and velocity of impact, patient kinematics and physical size, and the residual signature of energy release (e.g. major vehicle damage). Clinical judgement must be exercised and may upgrade to a high level of response and activation. Age and co-morbid conditions should be considered in the decision.

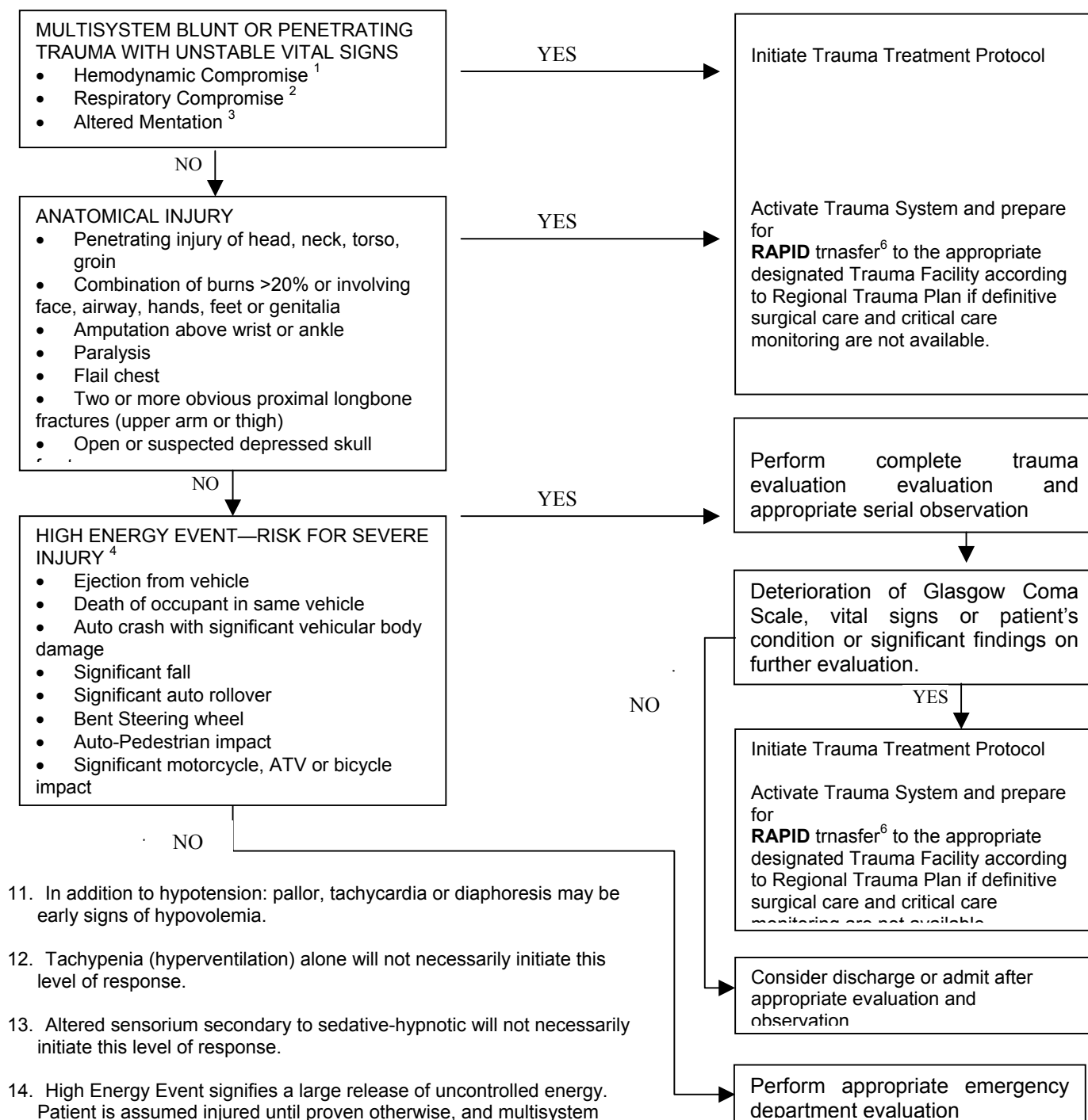
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ADULT TRIAGE, TRANSPORT AND TRANSFER GUIDELINES

Oklahoma*Model Trauma Triage Algorithm

-Level III/IV Trauma Center-

*Prepubescent patients, refer to **Pediatric Trauma Triage Algorithm**



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2. American College of Emergency Physicians: *Guidelines for Trauma Care Systems* (policy statement). Dallas, TX, American College of Emergency Physicians, 1992.
3. American College of Surgeons Committee on Trauma: *Resources for the Optimal Care of the Injured Patient*. Chicago, IL, American College of Surgeons, 1993.
4. State of New Mexico Department of Health, Community Health Systems Division, EMS Bureau: *Trauma System Plan, Trauma Triage Decision Scheme Guidelines*. Albuquerque, NM, State of New Mexico Department of Health, 1994.
5. Oregon Department of Human Resources, Health Division - Emergency Medical Services & Systems: *Oregon Trauma Care System Plan, Triage Criteria and Decision Scheme*. Portland, OR, Oregon Department of Human Resources, 1994.
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Patient Scenarios

1. Male patient , age 14, 60 kg. Impaled tree branch in abdomen in bike crash. Patient is lying on his side on the ground.

Airway: spontaneous breathing: shallow, slow, guarded respiration.

Hemodynamics: BP 70/40, Pulse 120.

Neurological: Alert, oriented, reports pain. PERL.

Skin: Pale, cool, moist.

Med Hx: Inapplicable.

Secondary exam unremarkable.

2. Male patient, age 65, 80 kg. Ejected from pickup during rollover. Patient is lying on his side on the ground.

Airway: spontaneous breathing, rapid, shallow, irregular, paradoxical chest movement.

Hemodynamics: BP 60/0, carotid pulse only is palpable, rate 128, weak.

Neurological: Unresponsive to pain.

Skin: cyanotic, cool and moist.

Med Hx: inapplicable.

Secondary exam reveals multiple lower leg fx, L wrist fx. and flail chest segment.

3. Female patient, age 25, 50 kg. Fell from bicycle handlebars. Complaining of R arm and shoulder pain. Patient is walking around the scene, cursing.

Airway: spontaneous breathing of normal depth and quality.

Hemodynamics. BP 140/90, radial pulse is rapid, full and regular.

Skin: warm and dry

Med Hx: inapplicable.

Secondary exam reveals point tenderness of the right clavicle.

4. Female patient, age 30, 80 kg. Caught between two cars when one rolled away. Complaining of bilateral lower leg fractures. Patient is sitting on the ground.

Airway: spontaneous breathing, rapid, un-labored.

Hemodynamics: BP 160/100, Pulse 110: radial pulses are full, rapid and regular.

Skin: pale, warm and dry.

Med Hx: inapplicable

Secondary exam is unremarkable.

- (b) Criteria to transport to hospital.
- (c) A protocol for care.
- (d) A guideline for protocol development.

6. Which three of the following are examples of multi-system trauma which would trigger a trauma alert.

- (a) 1, 2 & 4 1. Penetrating injury to chest.
- (b) 1, 3 & 5 2. Open or suspected depressed skull fracture.
- (c) 1, 4 & 5 3. Lacerations to the arm.
- (d) 2, 3 & 4 4. Unstable pelvis or suspected pelvic fracture

7. Which three of the following would be specific indicators of hemodynamic compromise in a trauma patient?

- (a) 1, 2 & 3 1. Capillary refill >3 seconds
- (b) 1, 2 & 5 2. Finger amputation
- (c) 2, 3 & 5 3. Systolic Blood Pressure below 89mmHg.(Adult)
- (d) 1, 3 & 4 4. Ashen pale skin color
- 5. Patients with signs of impaired thinking

8. Which of the following would not be a "trigger point" for a trauma system activation due to respiratory compromise in a trauma patient?

- (a) Upper airway obstruction.
- (b) Shallow, rapid or labored breathing secondary to trauma.
- (c) Flail chest.
- (d) History of emphysema.

9. Which of the following would not imply altered mentation in a trauma patient?

- (a) Patients with short term memory loss.
- (b) Patients with garbled speech.
- (c) Patient unable to walk.
- (d) Patient whose eyes do not open to voice or painful stimuli.

10. Which of the following is not true of a trauma treatment protocol?

- (a) They are orders for treating trauma patients.
- (b) They are suggestions, not requirements, for care.
- (c) They reflect the Medical Directors orders.
- (d) EMT's need protocols to deliver care beyond "first aid".

11. What Pediatric trauma score would require trauma system activation?

- (a) Pediatric trauma score greater than or equal to 8.
- (b) Pediatric trauma score greater than 12.
- (c) Pediatric trauma score less than or equal to 8.
- (d) Pediatric trauma score less than or equal to 9.

12. Which one of the following describes a Regional trauma Plan?

- (a) A city-wide protocol for trauma care.
- (b) Area -wide agreements on trauma care.
- (c) An ambulance service protocol.

(d) A state-wide protocol.

Match the following

13. Level I () a. 24 hour physician, surgeon on-call.
 14. Level II () b. 24 hour physician, surgeon, neurosurgeon on duty, research.
 15. Level III () c. 24 hour physician, surgeon, neurosurgeon on-call
 16. Level IV () d. 24 hour trained staff on duty, physician on-call

17. Which one of the following is not a component of Glasgow Coma Scale?

- (a) Eye-opening.
 (b) Verbal response.
 (c) Ambulation.
 (d) Motor response.

18. Which Glasgow Coma score (GCS) would trigger a trauma response?

- (a) Patient whose normal GCS is 12 or less.
 (b) Patient with GCS less than or equal to 13.
 (c) Motor component of the GCS greater than 5.
 (d) Two of the above.

19. Which of the following is the least true of childhood injuries.

- (a) Bicycle handle bar injuries are often serious
 (b) Lap belts can cause serious internal injuries.
 (c) Dog bite injuries can be very serious.
 (d) An injured child's condition usually degrades very slowly.

20. Which statement is most appropriate in treating major trauma patients?

- (a) Stabilize airway, get an I.V. and then transport.
 (b) Assure ABC's and load and go: do everything else enroute.
 (c) Immobilize, secure airway, then transport.
 (d) Stabilize the patient completely before you try to move them.

Comments:

- (f) Criteria to transport to hospital.
- (g) A protocol for care.
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