North Central Texas Trauma Regional Advisory Council

Trauma Triage Protocol

INTRODUCTION

A 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 transported to the appropriate level of care in a timely fashion based on clinical need.

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 standards.

Trauma Service Area-E (TSA-E) is diverse with urban, suburban, and rural areas. Persons injured in each of these areas may need to be triaged differently but with the intention of providing optimal care in spite of the area where the injury occurred. TSA-E has many different prehospital providers ranging from volunteer units to advanced aircraft agencies. Similarly, the hospitals in the region are variable in their ability and desire to care for injured patients.

Some hospitals in TSA-E are designated as trauma facilities. Other hospitals are actively working towards achieving designation. Other hospitals are not pursuing any level of designation. For the purposes of this document, a trauma facility is defined as a health care facility that is designated by the Texas Department of Health. A facility that is actively pursuing designation can receive trauma patients appropriate to the level of designation to which the facility is pursuing until December 1, 1999 if they demonstrate their commitment to trauma by informing the Department of Health or the NCTTRAC of their intentions or by having applied for designation or consultation to either the Department of Health or the American College of Surgeons.

The North Central Texas Regional Advisory Council has developed these triage guidelines to provide prehospital, hospital, and trauma facilities with assistance in triaging injured patients to appropriate levels of care. These guidelines may need to be modified to accommodate local conditions and will be continuously monitored by the NCTTRAC Quality Improvement Program.

Approved NCTTRAC: 4/14/98; Amended: 7/14/98
Approved TDH: 5/4/98

INCLUSIVE SYSTEM

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 often rely on over-triage 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 treating 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, interhospital transfers considering guidelines for immediate versus post-intervention transports, and factors that activate the regional system (see Table 1).

Table 1
Definition of Major Trauma-Adult

- Multisystem Blunt or Penetrating Trauma With Unstable Vital Signs (BP<90, HR>120, RTS<11, GCS<14)
- Penetrating Injury of head, neck, torso, groin
- Burns > 20% TBSA (2nd or 3rd degree) or involving face, airway, hands, feet, or genitalia
- Amputation (with reimplantation potential)
- Paralysis or other signs of spinal cord injury
- Flail chest
- Open or suspected depressed skull fracture
- Unstable pelvis or suspected pelvic fracture
- Two or more long bone fractures
- High energy event, such as
  - Ejection from vehicle
  - Significant fall (> 20 feet)
  - Rollover mechanism
  - Bent steering wheel
  - Auto-pedestrian impact
  - Motorcycle or bicycle involvement
  - Significant assault

Major trauma patient triage criteria should consider categories such as:

- Patients with multisystem blunt or penetrating trauma and unstable vital signs.
- Patients with known or suspected anatomical injuries and stable or normal vital signs.
- Patients who are 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. Triage occurs at both the prehospital and hospital level.

Pediatric patients (<13 years old) require a separate definition of major trauma due to their different physiologic response to injury:

Table 2
Definition of Major Trauma- Pediatric

- Multisystem Blunt or Penetrating Trauma With Unstable Vital Signs:
  - BP:
    - Neonate: <60 mmHg
    - Infant (<2yr): <65 mmHg
    - Child (2-5 yr): <70 mmHg
    - Child (6-12 yr): <80 mmHg
  - Respiratory rate: <10 or >60
  - PTS<9
  - GCS<14
- Penetrating Injury of head, neck, torso, groin
- Burns > 20% TBSA (2nd or 3rd degree) or involving face, airway, hands, feet, or genitalia
- Amputation (with reimplantation potential)
- Paralysis or other signs of spinal cord injury
- Flail chest
- Open or suspected depressed skull fracture
- Unstable pelvis or suspected pelvic fracture
- Two or more long bone fractures
- High energy event, such as
  - Ejection from vehicle
  - Significant fall (> 20 feet)
  - Rollover mechanism
  - Auto-pedestrian impact
  - Motorcycle or bicycle involvement
  - Significant assault

PREHOSPITAL TRAUMA TRIAGE

Prehospital triage should consider time and distance and identify patients needing transport to the most appropriate designated Trauma Center rather than the nearest acute care facility. In addition, prehospital triage criteria should allow for the activation of the trauma system from the field including an appropriate response from the designated Trauma Center. *(NOTE: Field personnel should always seek guidance from physicians providing on-line medical direction if there is any doubt regarding destination decisions or system activation.)* Figure 1 is the model prehospital algorithm for TSA-E.

After the trauma patient is identified, the first priority of management is the recognition of possible serious airway compromise. If this potential is identified, control of the airway is essential. If the field personnel are not capable of controlling the airway, then the patient should be transported to the nearest facility capable of managing airway or respiratory compromise. The prehospital providers should be familiar with the facilities in their area that are capable of managing airway problems rapidly.

If no airway problems are present or the airway has been controlled, the next determination is the presence of hypotension that indicates the possibility of active hemorrhage. These patients may need blood transfusions rapidly to prevent irreversible shock and death and should be transported to the nearest facility that can

initiate rapid stabilization and transfusions. In rural areas, this "facility" may include a higher level EMS agency or an air evacuation site. Air evacuation services can initiate transfusions during transport to a Level I or II Trauma Center. For ground transport, the patient should be transported to the highest level facility within 15 minutes. Prehospital providers should not wait longer than 15 minutes after the patient is ready for transport for aircraft evacuation; the patient should either be directed to a landing site closer to the Level I/II Trauma Center or to a local facility for stabilization.

If no hypotension is present, the patient should be taken to the most appropriate level Trauma Center within 15 minutes. Since Level I and Level II Trauma Centers are capable of providing the same level of care, they should be considered equal for triage purposes. If no Trauma Center is present within 15 minutes, the patient should be transported to the nearest Trauma Center, regardless of level of designation. Stabilization and transport can then be initiated at that facility prior to transport to a higher level facility.

For pediatric patients, the priorities are the same, but the definition of major trauma is different. Figure 2 is the model pediatric prehospital algorithm for TSA-E.

LEVEL III/IV TRAUMA CENTER

Level III/IV Trauma Center triage criteria should identify those patients needing immediate post-intervention transport (i.e., requiring initial stabilization and rapid transfer to a more comprehensive Trauma Center) and those patients that could be safely managed in the Level III/IV facility for further evaluation and serial observations. Level III facilities are expected to have the capability to manage most injuries and transfer those injuries that they do not have the capability to manage to the nearest Level I or II facility. Level IV facilities are expected to be stabilization and transfer facilities and are expected to transfer most patients to higher level facilities. Both Level III and Level IV facilities should develop protocols identifying which patients should be transferred, and these protocols should be widely disseminated throughout the Emergency Department. All Emergency Department personnel should be familiar with these protocols. Each Level III/IV Trauma Center should have a three-tiered response. The Level 1 Response identifies those patients that require a Trauma Team Activation. In many of these cases, the treatment requirements are not available at the Level III/IV facility and stabilization and transport to a Level I/II Trauma Center is necessary. The Level 2 Response identifies those patients that can initially be evaluated by a designated member of the trauma team with subsequent evaluation by a trauma surgeon. The Level III Response identifies those patients that can initially be evaluated by the Emergency Department Team with subsequent evaluation by a trauma surgeon or appropriate subspecialist, if necessary. Figure 3 is the model Level III/IV algorithm for TSA-E.

LEVEL I/II TRAUMA CENTER

Level I/II Trauma Center triage criteria should provide for the comprehensive evaluation and treatment of major trauma patients. The Level I Response identifies those patients that require a Trauma Team Activation. The Level 2 Response identifies those patients that can initially be evaluated by a designated member of the trauma team with subsequent evaluation by a trauma surgeon. The Level 3 Response identifies those patients that can initially be evaluated by the Emergency Department Team with subsequent evaluation by a trauma surgeon or appropriate subspecialist, if necessary. *(NOTE: The Trauma Center triage criteria should also consider changes that might occur during evaluation and observation.)* Figure 4 is the model Level I/II algorithm for TSA-E.

North Central Texas Trauma Advisory Council
Trauma Triage Algorithm
Prehospital - Adult

Major Trauma

NoⓇ

Transport to appropriate facility

Yes

Serious Airway Compromise

YesⓇ

Transport to closest facility capable of managing airway

No

BP less than 90mmHg
Or
Pulse>120/min
Or
Other signs of shock refractory to fluids

YesⓇ

Continue to transport to Highest Level Trauma Center [1]. If transport is greater than 15 minutes - Transport to nearest facility to provide stabilization & transfer

No

Transport to appropriate Level 1 or Level 2 Trauma Center

[1]Level 1 and Level 2 facilities should be treated as having equal capabilities.

Figure 1

North Central Texas Trauma Advisory Council
Trauma Triage Algorithm
Prehospital - Pediatric

Major Trauma

NoⓇ

Transport to appropriate facility

Yes

Serious airway or respiratory compromise that cannot be managed?

YesⓇ

Transport to nearest facility capable of managing airway/respiratory compromise

No

Hypotension present?
Neonate: <60
Infant (<2yr): <65
Child (2-5yr): <70
Child (6-12yr): <80

YesⓇ

Transport to nearest facility[1] that can rapidly initiate blood and provide initial stabilization[2] and transfer out to higher level of care.

No

Transport to Pediatric Trauma Center, if within 15 minutes[2]

[1]Nearest facility might include higher level of EMS agency or air evacuation landing site.
[2]If multiple levels of designation present within 15 minutes of eachother, go to highest level facility. Level I and II Trauma Centers should be considered equal.

Figure 2

North Central Texas Trauma Advisory Council
Trauma Triage Algorithm
Level III/IV Trauma Center

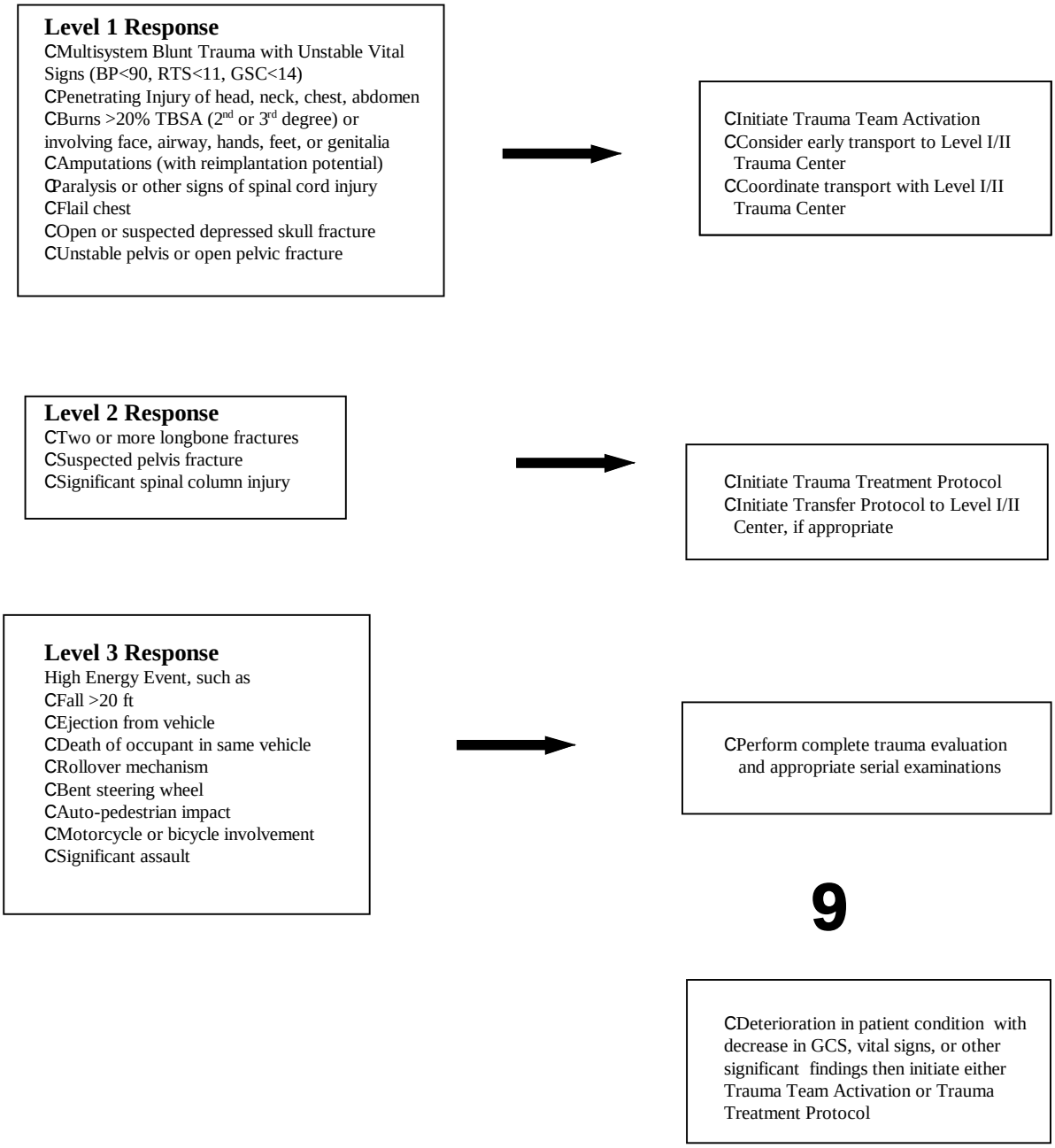

Figure 3

North Central Texas Trauma Advisory Council
Trauma Triage Algorithm
Level I/II Trauma Center

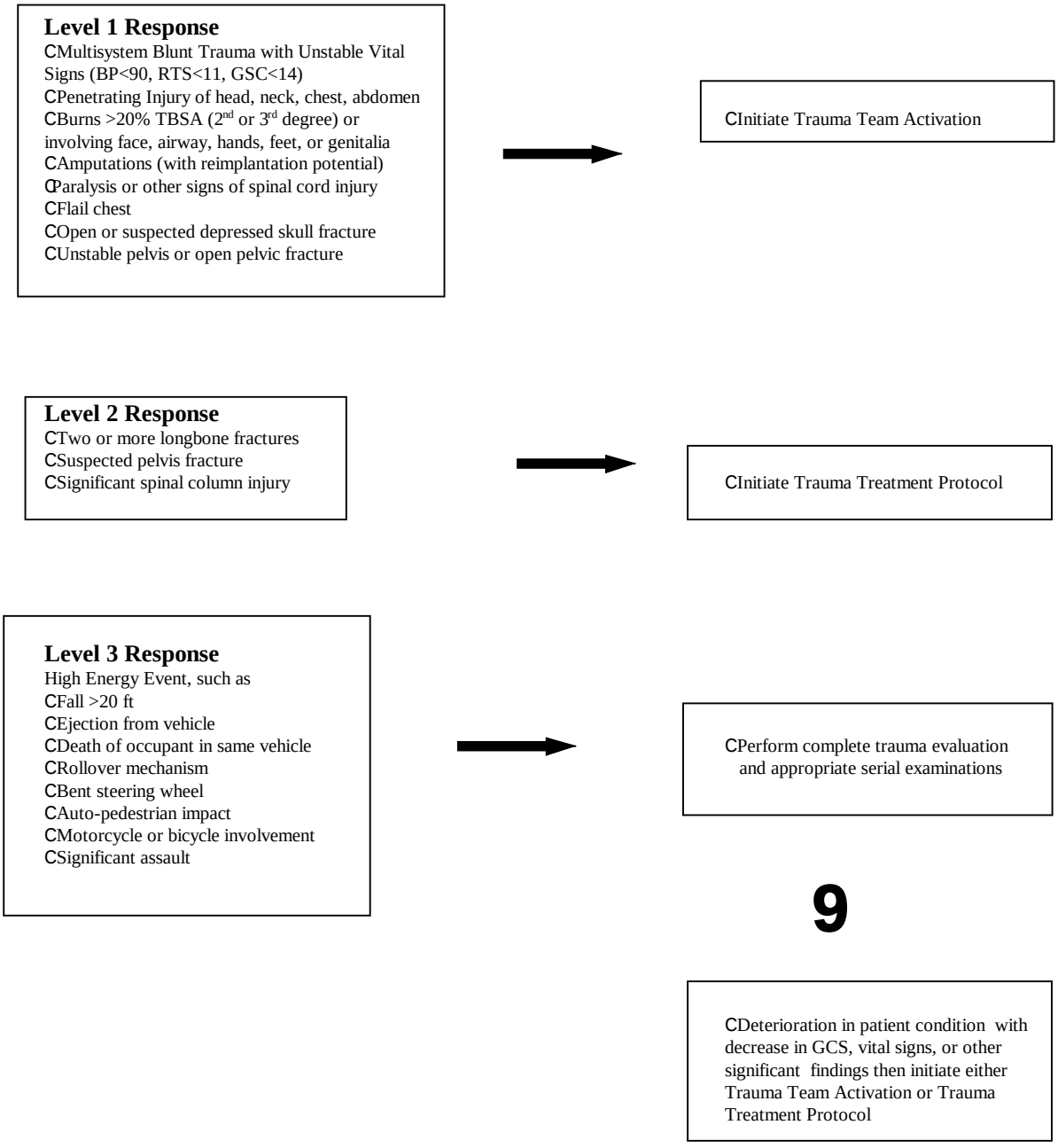

Figure 4