On September 16, 2019 the Board of Directors for the North Central Texas Trauma Regional Advisory Council (NCTTRAC) approved the revised Trauma Triage & Transport Guidelines for Trauma Service Area E.

The NCTTRAC 2019 Trauma Triage and Transport Guidelines were developed by the NCTTRAC Trauma Committee with input from all stakeholder committees.

Key changes to the guidelines are listed in the table below:

<table>
<thead>
<tr>
<th>Page /Section</th>
<th>Summary of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page 3., D.</td>
<td>Geriatrics section (additional language)</td>
</tr>
<tr>
<td>Page 3., E.</td>
<td>Pregnancy section (additional language)</td>
</tr>
<tr>
<td>Page 4., F.</td>
<td>Pediatric (age defined)</td>
</tr>
<tr>
<td>Page 4., G.</td>
<td>Special Needs Population (new section)</td>
</tr>
<tr>
<td>Page 4., H.</td>
<td>Morbidly Obese (new section)</td>
</tr>
<tr>
<td>Adult Algorithm</td>
<td>Revised (added Trauma Center levels of care - see orange box)</td>
</tr>
<tr>
<td>Pediatric Algorithm</td>
<td>New document</td>
</tr>
</tbody>
</table>

NCTTRAC thanks the following clinical committees who participated in the development, review and revision of these guidelines:

- Trauma Committee
- Medical Directors Committee and Trauma Medical Directors Focus Group
- Emergency Medical Services Committee
- Emergency Department Operations Committee
- Pediatric Committee

Please feel free to contact Jim Dickerson, Emergency Healthcare Systems Manager at (817) 607-7017 or jdickerson@ncetrac.org for any questions.

Attachment: 2019 NCTTRAC Trauma Triage & Transport Guidelines
Trauma Triage & Transport Guidelines
2019

Approved by the Board of Directors
September 16, 2019
North Central Texas Trauma Regional Advisory Council (NCTTRAC)
2019 Trauma Triage and Transport Guidelines

I. Introduction

Texas Administrative Code, Title 25, Part 1, Chapter 157, Subchapter G, Rule §157.123 establishes the legal framework of the Emergency Medical Services (EMS) Trauma System in the State of Texas; which includes the creation of Regional Advisory Councils and their respective authority to develop an EMS/Trauma System plan based on standard guidelines for comprehensive system development, to include pre-hospital triage criteria, diversion protocols, bypass protocols, and regional trauma treatment guidelines. As such, the North Central Texas Trauma Regional Advisory Council (NCTTRAC) has developed, vetted, and approved the following Trauma Triage and Transport Guides for use by North Central Texas EMS providers licensed by the Texas Department of State Health Services (TDSHS).

II. Overview

A. For the trauma patient, as for other critically ill patients, assessment is the foundation on which all management and transportation decisions are based.

B. The survival of the trauma patient is dependent upon rapid recognition/management of life-threatening injuries and rapid transport to an appropriate facility, as outlined on Page 2 of this document. Scene times should be kept to a minimum with only the necessary interventions made to correct immediate life threats. All secondary interventions should be performed enroute to an appropriate facility or while awaiting Air Medical evacuation.

C. The first step in trauma assessment is the Scene Assessment/Scene Size-Up. As you approach the scene, assure safety for yourself and the patient while taking BSI precautions. Rapidly identify the number/type of patients and request additional resources as appropriate.
   1. Additional resources (e.g., Air Medical evacuation, special rescue, additional ambulances) should be notified based off of dispatch information; and requested to proceed with arrival/landing on scene during scene assessment/scene size-up.
   2. Recognition of multi-patient incidents and mass-casualty incidents is critical. In these incidents, priority shifts from focusing all resources on the most injured patient to providing the greatest good to the greatest number of patients.

D. Once a brief scene assessment/scene size-up has been performed, which may include rapid triage of multiple patients, attention should focus on evaluating individual patients. Individual patients should be assessed/treated based off of initial triage priority.

E. The Primary Assessment begins with a simultaneous, or global, overview of the status of the patient’s respiratory, circulatory, and neurological systems to identify obvious, significant problems with oxygenation, circulation, hemorrhage, or gross deformities; followed by a rapid focused assessment of Airway, Breathing/Ventilation, Circulation/Bleeding, Disability, and Expose/Environment.
   1. Make immediate interventions to correct life-threats in the order found. Progress from BLS (least invasive) to ALS (most invasive), utilizing the most appropriate intervention warranted in a given situation.
   2. Assess the Patient’s Mental Status: If unresponsive, check for a pulse. If no pulse, initiate CPR per local protocol.
   3. Airway: While simultaneously applying C-spine precautions (if able), the provider should establish/ensure a patent airway by opening (e.g., jaw-thrust), clearing (e.g., suction), assessing, and intervening (e.g., OPA/NPA, King LTD-S, ET Tube).
   4. Breathing: Ensure adequate oxygenation and ventilation of the lungs utilizing appropriate oxygen-delivery devices. If abnormal ventilation is present, expose the chest and visually assess for trauma while obtaining breath sounds. If an open pneumothorax is present, cover with an occlusive dressing. If a tension pneumothorax is suspected, rapidly decompress the affected side.
   5. Circulation: Control massive hemorrhage utilizing appropriate hemorrage control devices. Observe the color, temperature, and moisture of the skin while rapidly assessing for the presence/location/quality of pulses (e.g., carotid, femoral, and radial) to estimate Blood Pressure and/or perfusion. IV access and fluid administration is secondary to initiation of Rapid Transport.
   6. Disability: Rapidly assess Level of Consciousness, pupils, and motor/sensor y responses. If Central Nervous System injury suspected, utilize appropriate devices to restrict spinal motion. Observe for increased ICP and signs/symptoms of impending brain-stem herniation (e.g., unequal pupils, bradycardia, hypertension, irregular respirations).
   7. Expose/Environment: Rapidly extricate/remove patients from dangerous environments (e.g., fire, snow, pool, etc.). Remove patients clothing in order to fully assess for injury. After assessing, cover patient to maintain body heat.

F. The Secondary Assessment begins after the recognition/management of life-threatening injuries found in the Primary Assessment, and after a transport decision has been made. The objective of the Secondary Assessment is to identify injuries not initially found.
   1. Reassess/Confirm Airway, Breathing, and Circulation. Make appropriate interventions as necessary.
   2. Obtain full, detailed vital signs utilizing available equipment.
   3. Obtain vascular access and administer appropriate fluid boluses to restore/maintain a radial pulse and/or SBP > 90 mmHg. Do not over-infuse fluids in trauma patients. Do not attempt to restore baseline vital signs.
   4. Perform a detailed head-to-toe physical examination.
   5. Immobilize/Splint suspected fractures and dress secondary wounds.
   6. Obtain SAMPLE history if able.

G. Continuously reassess airway, breathing, circulation, and disability. Document vital signs frequently. Make appropriate interventions as necessary.
III. Transport Algorithm

SEE ADULT AND PEDI ALGORITHMS

IV. Special Considerations

A. Aeromedical Evacuation: When requesting aeromedical assets, confirm the aircraft’s Estimated Time of Arrival (ETA) to the scene, in addition to the aircraft’s Total Time for transport (start-up, take-off, move to scene, land, load patient, take-off, move to hospital, land).

1. If the aircraft’s ETA is greater than the time it would take to transport by ground to the closest appropriate facility, initiate ground transport and direct the aircraft to change heading to the respective facility.
2. If the aircraft’s Total Time is greater than the time it would take to transport by ground to a Level 1 or Level 2 Trauma Center, initiate ground transport.
3. Aeromedical assets may be utilized to deliver higher echelons of care and/or specialty services when indicated (e.g. need for advanced airway management, surgical amputation teams, delivery of blood products).

B. Burns: Life threatening traumatic injuries should be identified and treated prior to burns. The following patients generally require treatment at a verified Burn Center as per the American College of Surgeons. In addition, treatment of these conditions at other facilities often results in transfer to a Burn Center and an overall delay in care.

1. >10% Partial-thickness burns
2. Full-thickness burns
3. Electrical burns
4. Chemical burns
5. Inhalation injury
6. Burns to the face, hands, feet, genitalia, and/or major joints

C. Cardiac Arrest: If patients are found to meet one or more the following criteria, CPR may be withheld and the patient declared dead if in accordance with local protocol.

1. Pulseless and apneic in addition to signs incompatible with life (e.g. decapitation, dependent lividity, rigor mortis, and decomposition).
2. No pupillary reflexes, no spontaneous movement, and no organized cardiac rhythm on the ECG greater than 40 complexes per minute.

D. Geriatrics: Traumatic injury in the geriatric population is increasing in prevalence and is associated with higher mortality and complication rates compared with younger patients. The risk of injury/death starts to increase after age 55 years. Elderly patients can experience significant injury in spite of relatively trivial mechanism. Because of altered baseline vital signs due to changes associated with aging, preexisting disease (e.g. hypertension), or medications (e.g. beta-blockers), the physiologic response to injury might differ from that seen in younger patients. Alterations in mentation may be attributed to dementia or delirium, leading to the potential for late recognition of shock or traumatic brain injury. These factors increase the risk for under-triage by both EMS and ED personnel.

E. Pregnancy: Trauma has become the leading cause of maternal death in the U.S.; therefore, the main principle guiding therapy must be aimed towards aggressive resuscitation of the mother.

1. Any pregnant woman who has reached 20 weeks gestation or more (palpable uterus above umbilicus), who has been involved in any trauma, especially a motor vehicular crash, regardless of the absence of any perceived contractions or pain, should be evaluated at the nearest trauma center that has OB capabilities.
2. Increased plasma volume may delay hypotension.
3. Pelvic fractures have increased risk for fetal demise.
4. Carbon monoxide exposure in a pregnant female should be considered a mandatory transport.
5. Stretching of the peritoneum during the third trimester of pregnancy blunts the normal perception of pain. Therefore, relying on complaints of abdominal pain in the pregnant woman to alert the care provider to possible injury is unreliable.
6. Treatment Recommendations:
   a. Perform Doppler fetal heart rates (FHR) – normal 110-160; every 5 min FHR checks for 30 seconds.
   b. Padded stretcher
   c. Place on side (side does not matter)
   d. Lactated Ringers preferred (500-1000 ml bolus)
   e. Oxygen – keep SpO2 > 95%
   f. Consider tocolytics (medical director protocol)

BoD Approved 9/16/2019

Review/Revision Date: September 16, 2019   D-1-4
Supersedes: 06/09/2015
F. Pediatrics: Pediatric is defined by the American College of Surgeons, GETAC, and NCTTRAC as < 15 years of age. Pediatric patients should be triaged preferentially to a Pediatric Trauma Center.
   1. If the term “lethargic” is used by the caregiver, the term needs to be described.
   2. When evaluating a patient that has experienced a possible life threatening event and the parents/guardians refuse medical treatment or transport, contact medical control.

G. Special Needs Population:
   1. Have families pre-notify EMS of the presence of a special needs child in the area.
   2. Be prepared and equipped for patient latex allergies.
   3. General recommendations:
      a. Treat ABCs first (like any other patient)
      b. Ask for help from caregivers (they know the child best)
         i. Assume ill or injured if affect or level of consciousness changes
         ii. Copy, scan, or take picture of the ready sheet from the caregiver
         iii. Inquire about spare supplies and bring with the patient
         iv. Look for USB bracelet with patient information
      c. If the emergency is secondary to the child’s equipment – USE YOURS
      d. Communicate with the patient based upon her/his developmental age, but do not underestimate their ability to communicate based on physical limitations.
      e. Clear, calm, SLOW, and helpful communication with the patient and caregivers is key to easing the patient’s stress.
      f. Do not rush if possible
      g. Never underestimate the strength of some of the special needs patients
      h. Stay at arm’s length away from the agitated patient
      i. Only force restrain as a last resort
      j. Some patients respond to items that provide tactful feedback
   4. Transport recommendations:
      a. A slow, careful transfer with two or more people may be required
      b. Position of comfort
      c. Do not attempt to straighten contractures as this may result in a fracture
      d. Transport family member or caregiver with you if possible; if not possible consider a comfort item (e.g. blanket, toy).
      e. Transport to the patient’s medical “home” hospital if possible

H. Morbidly Obese: Size of patient does NOT change trauma field triage criteria.
   1. Need agency policy development for these patients
   2. Mutual aid inter-agency agreements
   3. Equipment:
      a. Wider stretcher, higher related construction for load handling
      b. More robust ambulance construction
      c. Ramp equipment or hoist to load patient into vehicle
      d. Air mattress for lateral transfers
      e. Diagnostic equipment to proper fit these patients

I. Transfer of Patient Care Info: The regional standard for Patient Care Report (PCR/ePCR) handoff communication is as follows:
   1. The receiving facility should be notified of patient and patient status prior to EMS arrival.
   2. At the time of transfer of patient care, at a minimum, verbal communication will occur, and a paper short-list and/or electronic draft-report will be delivered.
   3. A final written or electronic full care report will be available within one business day.
   4. This regional standard expounds upon the minimum requirements set-forth in TDSHS EMS Rule §157.11(m).

BoD Approved 9/16/2019

Review/Revision Date: September 16, 2019 D-1-5
Supersedes: 06/09/2015
Adult Algorithm

Unstable Airway?

- Transport to the closest appropriate Trauma Center or Hospital Emergency Department.

NO

Measure Vital signs and level of consciousness

- Glasgow Coma Scale (GCS) \leq 13
- Systolic Blood Pressure (mmHg) < 90 mmHg (<110 for \geq 65 years old)
- Respiratory Rate \leq 10 or > 29 or need for ventilator support

YES

- Transport preferentially to the highest level of care within the local Trauma System via ground or air.

NO

Assess Anatomy of Injury

- Penetrating injuries to head, neck, torso
- Chest wall instability or deformity (e.g. flail chest)
- Two or more proximal long-bone fractures (humerus/femur)
- Crushed, de-gloved, mangled, and/or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture(s)
- Open or depressed skull fracture
- Paralysis

YES

- Transport to closest appropriate trauma center

NO

Assess mechanism of injury and evidence of high-energy impact

- Falls \geq 20ft
- High-risk auto crash evidenced by:
  - Intrusion, including roof: > 12 inches occupant site > 18 inches any site
  - Ejection from automobile (partial or complete)
  - Death in same passenger compartment
  - Vehicle telemetry data consistent with high risk of injury
  - Extrication \geq 20 minutes
- Auto vs. Pedestrian/Bicyclist > 20 mph impact and/or thrown/run over
- Motorcycle crash > 20 mph
- Burns > 10%
  - Without other trauma mechanism: triage to burn facility
  - With trauma mechanism: triage to trauma center

YES

Transport to closest appropriate trauma center

NO

Assess special patient or system considerations

- Geriatric patients (\geq 65 years of age)
  - May require higher-level triage and/or care
  - Low impact mechanisms (e.g. ground level falls) may result in severe injury
- Anticoagulants (anti-platelet, NOACs) and bleeding disorders
  - Patients with head injury are at high risk for rapid deterioration
- ESRD/Dialysis patients
- Pregnancy > 20 weeks
- EMS provider judgment

YES

- Trauma centers are designated Level I-IV.
- A Level I center has the greatest amount of resources and personnel for care of the injured patient and provides regional leadership in education, research, and prevention programs.
- A Level II facility offers similar resources to a Level I facility, possibly differing only in continuous availability of certain subspecialties or sufficient prevention, education, and research activities. Level II facilities are not required to be resident or fellow education centers.
- A Level III center is capable of assessment, resuscitation, and emergency surgery, with severely injured patients being transferred to a Level I or II facility.
- A Level IV trauma center is capable of providing 24-hour physician coverage, resuscitation, and stabilization to injured patients before transfer to a facility that provides a higher level of trauma care

NO

Transport per local protocol

BoD Approved 9/16/2019
Pediatric Algorithm
(Defined: <15 years of age)

Unstable Airway or Traumatic Arrest

NO

Measure vital signs and levels of consciousness

<table>
<thead>
<tr>
<th>Age</th>
<th>SBP (mmHg)</th>
<th>*RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 y</td>
<td>&lt; 70</td>
<td>&lt; 20 or &gt; 45</td>
</tr>
<tr>
<td>1:10 y</td>
<td>&lt; 70 + 2x age</td>
<td>&lt; 10 or &gt; 29</td>
</tr>
<tr>
<td>&gt; 10 y</td>
<td>&lt; 90</td>
<td>&lt; 10 or &gt; 29</td>
</tr>
</tbody>
</table>

- Glasgow Coma Scale (GCS): < 13
- *Respiratory compromise, obstruction, or intubation
- Blood Products to maintain vital signs

NO

Assess Anatomy of Injury

- GSW to head, neck, torso and/or extremities proximal to elbow and/or knee
- Burns > 10%
- Amputation proximal to wrist or ankle
- Paralysis or suspected spinal fracture with neurological symptoms
- Two or more long-bone fractures
- Open skull fracture
- Unstable pelvis
- Tender and/or distended abdomen
- Crushed, de-gloved, or mangled extremity

NO

Assess mechanism of injury and evidence of high-energy impact

- Falls ≥10ft or 2-3 times the height of the patient
- High-risk auto crash evidenced by:
  - Intrusion, including roof: > 12 inches occupant site
  - > 18 inches any site
  - Ejection from automobile (partial or complete)
  - Death in same passenger compartment
  - Vehicle telemetry data consistent with high risk of injury
  - Extraction ≥ 20 minutes
- Auto vs. Pedestrian/Bicyclist > 20 mph impact and/or thrown/run over
- Motorcycle crash > 20 mph
- Isolated head injury with loss of consciousness or altered mental status
- Suspected Non-accidental trauma
- Burns >10%
  - Without other trauma mechanism: triage to burn facility
  - With trauma mechanism: triage to trauma center

NO

Transport per local protocol

YES

Transport to the closest appropriate Trauma Center or Hospital Emergency Department.

YES

Transport preferentially to the highest level of care within the local Trauma System via ground or air.

Preferentially to a Pediatric Trauma Center

YES

Transport to closest appropriate trauma center

Preferentially to a Pediatric trauma center

- Trauma centers are designated Level I-IV.
- A Level I center has the greatest amount of resources and personnel for care of the injured patient and provides regional leadership in education, research, and prevention programs.
- A Level II facility offers similar resources to a Level I facility, possibly differing only in continuous availability of certain subspecialties or sufficient prevention, education, and research activities. Level II facilities are not required to be resident or fellow education centers.
- A Level III center is capable of assessment, resuscitation, and emergency surgery, with severely injured patients being transferred to a Level I or II facility.
- A Level IV trauma center is capable of providing 24-hour physician coverage, resuscitation, and stabilization to injured patients before transfer to a facility that provides a higher level of trauma care.