NORTH CENTRAL TEXAS
TRAUMA REGIONAL ADVISORY COUNCIL

2018 Regional Stroke Plan

Endorsed by NCTTRAC Board of Directors

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NCTTRAC serves the counties of Cooke, Fannin, Grayson, Denton, Wise, Parker, Palo Pinto, Ellis, Kaufman, Navarro, Collin, Hunt, Rockwall, Erath, Hood, Johnson, Somervell, Tarrant, and Dallas.

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I. INTRODUCTION

Mission

Understanding that *time is brain*, the mission of the North Central Texas Trauma Regional Advisory Council (NCTTRAC) Stroke Committee is to create an accountable patient-centered regional system of stroke care that improves the quality and expeditious access to appropriate stroke care within the region.

Vision

NCTTRAC Stroke Committee will provide leadership in stroke treatment by creating a broad stakeholder coalition with the responsibility and resources to develop, operate, evaluate and integrate a regional system of stroke care.

Organization

One of the NCTTRAC Stroke Committee's goals is to provide the infrastructure and leadership necessary to sustain an exemplary and concerted regional system of stroke care within the designated nineteen county region known as Trauma Service Area E (TSA-E) that can improve the level of care provided to persons living or traveling through this region. NCTTRAC standing committees and member organizations (hospitals, first responder organizations, emergency medical services (EMS) providers, air medical providers, emergency management and public health) work collaboratively to ensure that quality care is provided to stroke patients by pre-hospital and hospital professionals. The primary goal of the Regional Stroke Plan is to improve the stroke related morbidity and mortality, which will be achieved by promoting and advancing a collaborative effort focused on education, prevention, prehospital stroke management, stroke care, recovery and establishing uniform stroke system standards that addresses patients' outcomes and opportunities for improvement.

Regional Plan

The Regional Stroke Plan has been developed in accordance with generally accepted stroke guidelines, as well as procedures for implementation of a comprehensive EMS and regional system of stroke care. This plan does not establish a legal standard of care, but rather is intended as an aid to decision-making in care of stroke patients. The Regional Stroke Plan is not intended to supersede the physician's prerogative to order treatment.

II. SYSTEM OF STROKE CARE GOALS

The purpose of the Stroke Committee shall be to facilitate the collaboration and advancement of a regional system of stroke care that is based on accepted standards of care. The NCTTRAC Stroke Committee will solicit participation from health care facilities, organizations, entities and professional societies involved in health care. NCTTRAC Stroke Committee will encourage regional participation in providing and outlining quality stroke care that is patient-focused, complies with state and national guidelines and seeks to expeditiously triage stroke patients to the most appropriate level of care. NCTTRAC Stroke Committee shall develop a plan for a regional system of stroke care that:

- Promotes collaboration and commitment among EMS providers, hospitals and members of the NCTTRAC Committees.
- Develops uniform stroke system standards that addresses patients' needs, outcomes and opportunities for improvement.
- Promotes stroke algorithms and protocols that facilitate early triage of stroke patients to the most appropriate level of care.
- Establishes system coordination for access, protocols/procedures and inter-hospital transfers. These structures will establish continuity and uniformity of care among the providers of stroke care.
- Promotes educational opportunities that are focused on increasing public and stakeholders (EMS ad facilities) awareness about stroke.

III. RECOGNITION OF STROKE FACILITIES

Goal

The goal of the NCTTRAC Stroke Committee is to ensure that there is understanding of the certified stroke facilities within the region, that prehospital stroke algorithms outline triage to the appropriate stroke facility and this information is available for patient destination decision making.

Committee Charged

Responsibilities charged to the NCTTRAC Stroke, Medical Directors and EMS Committees.

Objective

The NCTTRAC Stroke Committee will utilize the Texas Department of State Health Services (DSHS) recognized designation for stroke facilities as Comprehensive Stroke

Facility/Level 1, Primary Stroke Facility/Level 2 and Support Stroke Facility/Level 3. The facilities, including children's facilities, are required to meet the current Brain Attack Coalition recommendations; actively participate on the NCTTRAC Stroke Committee and submit data to the department as requested.

As outlined by the Texas Administrative Code, 157.133 Requirements for Stroke Facility Designation:

- For the purposes of Stroke Facility designation, DSHS will accept certifications or survey results from these recognized agencies:
    - The Joint Commission (TJC) - Comprehensive or Primary Stroke Certification
    - Det Norske Veritas Global Healthcare (DNV-GL) – Comprehensive or Primary Stroke Certification
    - The Center for Improvement in Healthcare Quality (CIHQ) – Primary Stroke Certification
    - Healthcare Facilities Accreditation Program (HFAP) – Primary Stroke Certification
    - Texas EMS Trauma and Acute Care Foundation (TETAF) – Support Stroke survey results
- A healthcare facility may not use the terms "stroke facility," "stroke hospital," "stroke center," "comprehensive stroke center," "primary stroke center," "support stroke facility" or similar terminology in its signs or advertisements or in the printed materials and information it provides to the public unless the healthcare facility is currently designated as that level of stroke facility according to the process described by the DSHS.
- EMResource is the official means of notification of these capabilities and their availability.

NCTTRAC will not designate stroke facilities at any level, but may set minimum standards for what is considered active participation for the purposes of a Letter of Participation:

- Maintenance of a valid DSHS designation as a Stroke Center (Level I, II, or III).
- NCTTRAC minimum participation requirements as defined in the NCTTRAC Bylaws or Standard Operating Procedures.

IV. COMMUNITY AWARENESS AND STROKE PREVENTION

Goal

Through a collaboration between NCTTRAC participating hospitals and EMS Providers, the goal is to increase public awareness of the signs and symptoms of stroke, stroke treatment options, as well as the risk factors and behavior modifications aimed at stroke prevention. An additional goal is to increase utilization of 911 services for patients suspected of having an acute stroke.

Committee Charged

Responsibilities charged to the NCTTRAC Stroke and Public Education/Injury Prevention Committees.

Objective

The NCTTRAC stroke system stakeholders (EMS and facilities) will partner to conduct health education, increase public awareness and provide community outreach on the emergent care of stroke and its prevention. Education will also include the importance of early activation of 911 services and the role EMS play in treatment of patients with an acute stroke.

V. SYSTEM ACCESS

Goal

The goal for system access within TSA-E is two-fold. First, access to emergency stroke care within the region must be rapidly available. Second, EMS must be available to provide quality health care to patients in TSA-E. In portions of this region, First Responder Organizations (FRO) may provide initial treatment pending EMS arrival.

Committee Charged

Responsibilities charged to the NCTTRAC EMS and Stroke Committees.

Objective

One of the primary elements of an EMS/Stroke system is to provide access to EMS and subsequent mobilization of a medical response to the scene. Every call for emergency

services should universally and automatically be accompanied by location identifying information. A regional system providing dedicated lines that allow direct routing of emergency calls is ideal. Routing is based on telephone exchange areas, not municipal boundaries. Automatic Number Identification (ANI) and Automatic Location Identification (ALI) should be available. Alternative Routing allowing 911 calls to be routed to a designated alternative location is in effect. Most areas route their calls to the county 911 in case of overload or failure.

When calls come into a 911 center, the communication system ensures that the call taker has the appropriate written protocols as well as proper training. The caller should not have to talk to more than two telecommunications personnel. The call transfer equipment used in transferring these calls should take no longer than ten seconds and the equipment must have a history of being 95% reliable.

VI. COMMUNICATIONS

Goal

EMS communications systems must provide the means by which emergency resources can be accessed, mobilized, managed and coordinated. An emergency assistance request and the coordination of the response require communication linkages for: 1) access to EMS from the scene of the incident, 2) dispatch and coordination of EMS resources, 3) coordination with medical facilities and 4) coordination with other public safety and emergency personnel. EMS should notify the receiving stroke facility of incoming acute stroke patient transports in order for the facility to activate their stroke protocol.

Committee Charge

Responsibilities charged to the NCTTRAC EMS and Stroke Committees.

Objective

The system of communication is an integral part of a regional plan for the care of stroke patients. Networks should be geographically integrated and based on the functional need to enable routine and special large-scale operations for communications among EMS and other public safety agencies. Utilization of system status management technology should be considered for both areas with high demand of mobile resources and for those areas where resources may not be readily available on a routine basis, but would benefit from shifting resources from one geographic area to another.

EMS communication center(s) should be staffed with fully trained tele communicators. The ideal tele communicator should have completed an Emergency Dispatch course, such as the Emergency Medical Dispatch: National Standard Curriculum as offered from the National Highway Traffic Safety Administration and the U.S. Department of Transportation.

NCTTRAC encourages 100% participation from all EMS agencies within the nineteen counties that comprise TSA-E. By enhancing participation, NCTTRAC can identify quality issues related to response times. NCTTRAC can then move toward the resolution of these issues through assessment, education, intervention and evaluation through system process improvement (SPI) procedures.

VII. MEDICAL OVERSIGHT

Goal

The development of a regional system of stroke care requires the active participation of qualified physician providers. Physicians should be clinically qualified in their area of practice and have expertise and competence in the treatment of stroke patients. The regional system of stroke care will be developed under the direction of representatives of NCTTRAC medical staff throughout the region.

Committees Charged

Responsibilities are charged to the NCTTRAC Medical Directors Committee.

Objective

Provide consistent medical oversight to ensure regional guidelines align with national standards.

VIII. REGIONAL PRE-HOSPITAL MEDICAL CONTROL

Goal

The Regional Stroke Plan will assist with identification and education of regional medical control resources, standardize guidelines and analyze accessibility of medical control

resources. Additionally, it will identify and educate NCTTRAC EMS Providers and sources of medical direction.

Committees Charged

Responsibilities are charged to the NCTTRAC EMS, Medical Directors and Stroke Committees.

Objectives

All EMS Providers have a Medical Director for their service. The Medical Directors have signed a form verifying that they are following the NCTTRAC guidelines for the treatment of patients within their area. These forms are updated and maintained by NCTTRAC staff.

NCTTRAC encourages coordinated medical control in our region and to that end has organized a Medical Directors Committee which meets periodically to review the protocols and guidelines for EMS Providers within TSA-E. Several medical directors have multiple EMS Providers working with them to help consolidate and control the pre-hospital care of the stroke patients but this is not a mandatory requirement at this time. Through the efforts of the Medical Directors Committee, NCTTRAC will continue to work towards developing consistency and standardization of the guidelines used within our region.

Physician Involvement in Regional Plan Development – The Medical Directors Committee meets quarterly to conduct its usual business and to review and approve regional planning components, policies and guidelines related to medical care. Each EMS Medical Director and at least one physician from each NCTTRAC hospital has the opportunity for representation on this standing working group. All physicians within TSA-E are invited to attend these meetings.

Medical Direction of Pre-hospital Care Providers – In accordance with DSHS guidelines, all NCTTRAC pre-hospital care providers function under medical control through a delegated physician practice. Regional EMS guidelines are available online to all EMS Providers for incorporation into local protocols. Periodic reviews and updates are completed and upon approval are distributed as necessary. These guidelines serve as a baseline and individual Medical Directors may adapt for their local community.

Regional Quality Improvement – The Medical Directors Committee meets quarterly to conduct business and to carry out regional quality improvement activities. (Please see System PI section for more details).

EMResource - is the official means by which hospitals can update EMS Providers as to their DSHS stroke designation level. It is the responsibility of the DSHS stroke facilities to maintain an accurate status reflecting the level of designation by law. Additionally, it is the responsibility of the EMS Providers to use EMResource to verify a hospital's DSHS designation and to monitor if the facility is experiencing any issues that could affect the hospital's ability to provide appropriate stroke care.

IX. Pre-Hospital Triage and Management

Goal

Stroke patients will be identified rapidly and appropriately assessed. Based on last known well and severity of symptoms, suspected stroke patients will be transported to the nearest appropriate designated stroke facility.

Committee Charge

Responsibilities are charged to the NCTTRAC EMS, Stroke, Medical Directors and Emergency Department Operations Committees.

Purpose

The pre-hospital acute stroke triage and transport recommendations serve to direct the regional triage of adult acute stroke patients (greater than or equal to 18 years of age) to the facility most appropriate based upon the duration and severity of stroke symptoms. In the event EMS encounters an acute stroke patient under the age of 18, contact the closest pediatric hospital or Medical Control for guidance. In the absence of high-quality evidence or guideline statements, consensus of expert opinion (Pediatric Neurologist, Vascular Neurologists, Neuroendovascular Surgeons and Neurosurgeons) based on clinical experience and with conferment with NCTTRAC Medical Directors and Stroke Committee members are outlined in the recommendations. See appendix A for the Acute Stroke Triage and Transport Algorithm, which is based on the American Stroke Association Mission: Lifeline Stroke Algorithm.

Prehospital Triage of Stroke Patients

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT:

- **A (Airway)**: Airway support and ventilator assistance are recommended for patients with acute stroke who have decreased consciousness or who have compromised airway. Ensure airway patency with suctioning and OPA or NPA, as needed.

- **B (Breathing)**: Supplemental oxygen should be provided to maintain oxygen saturation > 94% (continuous monitoring).
- **C (Circulation)**: Evaluate, document and treat signs/symptoms of shock according to the Shock Clinical Practice Guidelines (CPG).
- **D (Disability)**: Assess and document GCS, pupillary size and reactivity.
- **E (Exposure/Environmental)**: Assess for evidence of traumatic injury, especially head injury.

2. Positioning/stabilization:

- Place the patient in a supine position, head of the bed elevated 30 degrees.
- If there is evidence of **shock**, treat according to the **Shock CPG.**
- If there is **hypoglycemia** (POC glucose < 60 mg/gL), treat according to **Diabetic Emergencies CPG.**
- If there is **Seizures**, treat according to the **Seizure CPG.**

Assessment

History

1. Establish symptoms and **last known well**, or last time patient without symptoms:
   - If the patient cannot communicate the time and there is no witness present to report the time, attempt to obtain a phone number for witnesses or family members.
   - NOTE: For "wake up strokes" the time documented is the time last known well not the time the patient was found.
   - NOTE: **Sudden** onset of **any** of the following suggests the possibility of acute stroke:
     - Numbness or weakness of face, arm and/or leg (especially on one side of the body)
     - Confusion
     - Trouble speaking or understanding language
     - Trouble seeing in one or both eyes or double vision
     - Trouble walking
     - Dizziness
     - Loss of balance or coordination
     - Sudden onset of severe headache with no known cause (suggests hemorrhagic stroke)
     - Any asymmetry of the neurological exam
2. Additional History:
   - Items to Report: seizure at onset, head trauma, history of recent surgeries, history of bleeding problems, signs of possible brain hemorrhage [severe headache of sudden onset, nausea/vomiting with headache or loss of consciousness (LOC)].
   - Additional history: Past medical history, allergies (iodinated contrast).
   - Be alert to common stroke mimics*.
   - Medications – obtain a list of all mediations including blood thinners such as direct thrombin inhibitors, factor Xa inhibitors, low molecular weight heparin and unfractionated heparin [ie warfarin (Coumadin), rivaroxaban (Xarelto), dabigatran (Pradaxa), apixaban (Eliquis), edoxaban (Savaysa), enoxaparin (Lovenox)].
     - If possible record when last dose was taken.
   - Device/implant history (ie left ventricular assist device, pacemaker, valve replacement).

Examination

- Assess and record blood pressure, rate, rhythm, respiratory rate and oxygen saturation.
- Apply stroke assessment tool: Cincinnati Prehospital Stroke Scale, Los Angeles Prehospital Stroke Screen or Face, Arm, Speech Test
- If the stroke assessment tool is positive apply a stroke severity scale: Cincinnati Stroke Triage Assessment Tool (CSTAT), Field Assessment Stroke Triage for Emergency Destination (FAST-ED), Los Angeles Motor Scale (LAMS), Rapid Arterial Occlusion Evaluation Scale (RACE) or Vision, Aphasia, Neglect (VAN) Assessment.

Management

- EMS personnel should begin the initial management of stroke in the field as outlined in this document.
- Prevent aspiration, HOB > 30. Ensure airway patency with suctioning and OPA or NPA, as needed.
- Provide supplemental oxygen if needed to keep oxygen saturation > 94%
- Treatment of hypertension is NOT recommended unless blood pressure $\geq$ 220/120 mmHg.
- Treat hypotension. Evaluate, document and treat signs/symptoms of shock according to the Shock CPG. If possible obtain EKG during workup, as long as it does not delay transportation to appropriate hospital.
- Avoid dextrose containing fluids in non-hypoglycemic patients.
- Perform and document a POC Glucose analysis and treat according to the ASA 2018 Guidelines for Management of Acute Ischemic Stroke.
    - Hypoglycemia (blood glucose < 60 mg/dL) should be treated in patients suspected of acute ischemic stroke.
- To facilitate expedited stroke workup in the ED, place at least one 18 or 20 gauge IV in the antecubital fossa or forearm (right preferable).
- To facilitate fastest Door-to-Needle and stroke care, if possible collect blood sample to provide receiving facility, however, as long as it does not delay transfer.

System Triage

- Goal for on scene time, 10-15 minutes or less.
- See appendix A for the Acute Stroke Triage and Transport Algorithm.
- Call stroke alert, pre-notify receiving facility.
- Goal: 30 seconds for EMS to ED triage nurse hand-off.
- Bypass Exclusions:
    - If severe or life threatening trauma is suspected in addition to stroke, transfer to the appropriate level trauma center.
    - Patients under hospice care or with Medical Orders for Scope of Treatment (MOST) that outlines no emergency measures should go to the nearest appropriate hospital.

**Common ischemic stroke mimics: alcoholic intoxication, cerebral infections, drug overdose, hemorrhagic stroke, hypoglycemia, hyperglycemia, metabolic disorders, atypical migraines, neuropathies (eg Bell's palsy), seizure, post-ictal state and tumors.*

X. Pediatric Stroke Triage and Management

Goal

To increase awareness and identification of strokes in the pediatric population (infants and children less than 18 years of age), as well as increase rapid triage and transport to the nearest appropriate children's facility.

Committee Charge

Responsibilities are charged to the NCTTRAC EMS, Stroke, Pediatric, Medical Directors and Emergency Department Operations Committees.

Purpose

The pre-hospital acute stroke triage and transport recommendations serve to direct the regional triage of pediatric patients with acute stroke to the most appropriate facility. In the event EMS encounters an acute stroke in a pediatric patient, contact the closest pediatric stroke hospital or Medical Control for guidance.

Prehospital Triage of Stroke Patients

Basic Level

1. Assess and support ABCs according to UNIVERSAL – PEDIATRIC:

- **A (Airway)**: Airway support and ventilator assistance are recommended for patients with acute stroke who have decreased consciousness or who have compromised airway. Ensure airway patency with suctioning and OPA or NPA, as needed.
- **B (Breathing)**: Supplemental oxygen should be provided to maintain oxygen saturation > 94% (continuous monitoring).
- **C (Circulation)**: Evaluate, document and treat signs/symptoms of shock according to the Shock Clinical Practice Guidelines (CPG).
- **D (Disability)**: Assess and document GCS, pupillary size and reactivity.
- **E (Exposure/Environmental)**: Assess for evidence of traumatic injury, especially head injury.

2. Positioning/stabilization:

- Place the patient in a supine position, head of the bed elevated 30 degrees.
- If there is evidence of **shock**, treat according to the **Shock CPG.**
- If there is **hypoglycemia** (POC glucose < 60 mg/gL), treat according to **Diabetic Emergencies CPG.**
- If there is **Seizures**, treat according to the **Seizure CPG.**

Assessment

History

3. Consider stroke in any pediatric patient with headache and/or sudden new-onset focal neurological symptoms.
    a. Causes include:
        i. Congenital heart conditions/surgery
        ii. Sickle Cell Disease and other hematologic conditions, such as those causing abnormal blood clotting
        iii. Infectious/inflammatory (vasculitis) and non-inflammatory blood vessel conditions
        iv. Metabolic conditions
        v. Drug ingestion like cocaine or methamphetamine
4. Presentation of stroke in the pediatric population may differ from adults. Seizures at presentation are more common than in the adult population.
    a. Infants may present with focal weakness, altered level of consciousness and seizures.
    b. Children may present with headache, focal neurologic deficit, altered level of consciousness and seizures.
5. Establish symptoms and **last known well** or last time patient without symptoms:
    - If the patient cannot communicate the time and there is no witness present to report the time, attempt to obtain a phone number for witnesses or family members.
    - NOTE: For “wake up strokes” the time documented is the time last known well not the time the patient was found.
    - NOTE: **Sudden** onset of **any** of the following suggests the possibility of acute stroke:
        - Numbness or weakness of face, arm and/or leg (especially on one side of the body)
        - Confusion
        - Trouble speaking or understanding language
        - Trouble seeing in one or both eyes or double vision
        - Trouble walking
        - Dizziness
        - Loss of balance or coordination
        - Sudden onset of severe headache with no known cause (suggests hemorrhagic stroke)
        - Any asymmetry of the neurological exam
6. Additional History:
    - Items to Report: seizure at onset, head trauma, history of recent surgeries, history of bleeding problems, signs of possible brain hemorrhage [severe headache of sudden onset, nausea/vomiting with headache or loss of consciousness (LOC)].
    - Additional history: Past medical history, allergies (iodinated contrast).
    - Be alert to common stroke mimics*.

- Medications – obtain a list of all mediations including blood thinners such as direct thrombin inhibitors, factor Xa inhibitors, low molecular weight heparin and unfractionated heparin [ie warfarin (Coumadin), rivaroxaban (Xarelto), dabigatran (Pradaxa), apixaban (Eliquis), edoxaban (Savaysa), enoxaparin (Lovenox)].
    - If possible record when last dose was taken.
- Device/implant history (ie left ventricular assist device, pacemaker, valve replacement).

Examination

- Assess and record blood pressure, rate, rhythm, respiratory rate and oxygen saturation.
- Apply stroke assessment tool if appropriate: Cincinnati Prehospital Stroke Scale, Los Angeles Prehospital Stroke Screen or Face, Arm, Speech Test.
- If the stroke assessment tool is positive apply a stroke severity scale if patient can comply: Cincinnati Stroke Triage Assessment Tool (CSTAT), Field Assessment Stroke Triage for Emergency Destination (FAST-ED), Los Angeles Motor Scale (LAMS), Rapid Arterial Occlusion Evaluation Scale (RACE) or Vision, Aphasia, Neglect (VAN) Assessment.

Management

- EMS personnel should begin the initial management of stroke in the field as outlined in this document.
- Prevent aspiration, HOB > 30. Ensure airway patency with suctioning and OPA or NPA, as needed.
- Provide supplemental oxygen if needed to keep oxygen saturation > 94%.
- Normotension target systolic blood pressure, between 50th and 90th percentile for age.
- Treat hypotension. Evaluate, document and treat signs/symptoms of shock according to the Shock CPG. If possible obtain EKG during workup, as long as it does not delay transportation to appropriate hospital.
- Avoid dextrose containing fluids in non-hypoglycemic patients.
- Perform and document a POC Glucose analysis and treat according to the ASA 2018 Guidelines for Management of Acute Ischemic Stroke.
    - Hypoglycemia (blood glucose < 60 mg/dL) should be treated in patients suspected of acute ischemic stroke.
- To facilitate expedited stroke workup in the ED, place at least one 18 or 20 gauge IV in the antecubital fossa or forearm (right preferable).
- To facilitate fastest Door-to-Needle and stroke care, if possible collect blood sample to provide receiving facility, however, as long as it does not delay transfer.

System Triage

- Goal for on scene time, 10-15 minutes or less.
- **Destination decision-making for pediatric patients less than 18 years of age with possible stroke:**

    - Transfer to the closest pediatric stroke hospital or contact Medical Control for guidance.
- Call stroke alert, pre-notify receiving facility.
- Goal: 30 seconds for EMS to ED triage nurse hand-off.

**Common ischemic stroke mimics: alcoholic intoxication, cerebral infections, drug overdose, hemorrhagic stroke, hypoglycemia, hyperglycemia, metabolic disorders, atypical migraines, neuropathies (eg Bell's palsy), seizure, post-ictal state and tumors.*

XI. Helicopter Activation

Goal

Regional air transport resources may be appropriately utilized in order to reduce delays in providing optimal stroke care.

Committees Charged

Responsibilities are charged to the NCTTRAC Air Medical Committee with input from the EMS and Stroke Committees and guidance from the Medical Directors Committee.

Decision Criteria

- Helicopter activation/scene response may be considered when it can reduce transportation time or provide advanced life support.
- Patients meeting criteria for helicopter dispatch should be transported to the most appropriate designated stroke facility.

Refer to Appendix D: *Aircraft Utilization and Systems Performance Review*

XII. Facility Diversion

Goal

NCTTRAC stroke facilities will communicate the availability of acute stroke patient care capability status promptly and clearly to the regional EMS and other facilities through EMResource in order to ensure that stroke patients are transported to the closest appropriate stroke facility.

Committee Charge

Responsibilities charged to the NCTTRAC EMS, Medical Directors and Stroke Committees.

System Objective

- The system objective is to ensure that stroke patients will be transported to the closest appropriate facility.
- Designated stroke facilities failing to meet and /or maintain critically essential criteria, as outlined by the State of Texas and the accrediting agency (TJC, DNV-GL etc) shall provide notification about such failings within five days to the NCTTRAC, the DSHS office, regional EMS and other healthcare facilities (from which it receives and to which it transfers stroke patients) through EMResource.

XIII. INTER-HOSPITAL TRANSFERS

Goal

The goal for establishing and implementing inter-hospital transfer criteria in NCTTRAC is to ensure that stroke patients requiring additional or specialized care and treatment beyond a facility's capability are identified and transferred to the most appropriate facility as quickly as possible. Regional hospital transferring stroke patients to a higher level of care, for the purposes of endovascular revascularization therapy (ERT), an urgent neurosurgical procedure or other urgent treatment, should establish goal Door-In Door-Out (DIDO) time for patients arriving to the emergency department as well as Picture to Door-Out time for inpatients.

Committee Charge

Responsibilities charged to the NCTTRAC Stroke Committee with input from Air Medical, Emergency Department Operations, EMS and Medical Directors Committees.

Purpose

The inter-hospital transfer recommendations serves to outline best practices that will facilitate the rapid transfer of stroke patients requiring a higher level of care. In the absence of high-quality evidence or guideline statements, consensus of expert opinion based on clinical experience and conferment with vascular neurologist, neurosurgeons and emergency department physicians was obtained.

Objectives

- To ensure that all regional hospitals caring for stroke patients within the NCTTRAC stroke system of care develop, adopt and adhere to care protocols that reflect current care guidelines as established by national and international professional organizations and state and federal agencies and laws.
    - Patients identified to have an acute ischemic stroke from a large vessel occlusion (LVO) and are less than 24 hours from last known well should be considered for transfer to a Comprehensive Stroke Center (Level 1) if eligible for ERT.
- To establish well delineated protocols for triage and transportation.
- To outline goal transfer times from NCTTRAC regional hospital emergency service:
    - **DIDO of 60 minutes for patients not receiving IV rt-PA**
    - **DIDO of 90 minutes for patients who receive IV rt-PA**
- To outline goal transfer times from NCTTRAC regional hospital inpatient service:
    - **Picture to Door-Out of 60 minutes for patients not receiving IV rt-PA**
    - **Picture to Door-Out of 90 minutes for patients who receive IV rt-PA**

Hospital Triage from Emergency Department

- Prehospital triage as outlined in appendix A Acute Stroke Triage and Transport Algorithm.
- All hospitals caring for stroke patients within a stroke system of care should develop, adopt and adhere to care protocols that reflect current care guidelines as established by national and international professional organizations and state and federal agencies and laws.
- Regional hospitals that may be transferring patients to other facilities, should establish hand-off, transfer protocols and procedures that ensure safe and efficient patient care within and between facilities.
- Protocols for inter-hospital transfer of patients should be established and approved beforehand so that efficient patient transfers can be accomplished at all hours of the day and night.
- Regional hospitals that may be transferring patients to other facilities, should establish transfer protocols, terminology (code stroke), agreements and procedures that ensure safe and efficient patient care with EMS agencies that are capable of transportation via ground and air.
- In all patients within 24 hours from last known well that are suspected of having an acute ischemic stroke early identification of possible LVO is recommended.
    - Consider utilizing a stroke severity scale or NIHSS upon arrival to the emergency room to identify possible LVOs.
        - Recommended stroke severity scale: Cincinnati Stroke Triage Assessment Tool (CSTAT), Field Assessment Stroke Triage for Emergency Destination (FAST-ED), Los Angeles Motor Scale (LAMS), Rapid Arterial Occlusion Evaluation Scale (RACE) or Vision, Aphasia, Neglect (VAN) Assessment.
- Early Notification of CSC (Level 1) and activation of EMS transport team.

    - Notify CSC (Level 1) on arrival and dispatch EMS transport team, crew should be on standby for transfer (prior to imaging), if LVO screen is positive and patient meets established criteria for transfer.
- It may be useful for primary stroke centers and other healthcare facilities that provide initial emergency care, including administration of IV alteplase, to develop the capability of performing emergency noninvasive intracranial vascular imaging to most appropriately select patients to transfer for endovascular intervention and to reduce the time to ERT.
    - **0-6 hours** from last known well: ERT eligibility will be based in part on NIHSS, CT ASPECT score and demonstration of a LVO on CT angiogram of the head and neck.
    - **6-24 hours** from last known well: ERT eligibility will be based in part on NIHSS, CT ASPECT score, demonstration of LVO on CT angiogram of head and neck and target mismatch profile on CT perfusion, DW-MRI or MRI perfusion (performed either at transferring or receiving hospital).
- Regional hospitals triaging stroke patients suspected of having an intracranial LVO (positive stroke severity screen) should consider concurrent vascular imaging with noncontrast head CT.
    - **6-24 hours** from last known well consider CT perfusion, DW-MRI or MRI perfusion if capable.
- For patients who otherwise meet criteria for ERT, a noninvasive intracranial vascular study is recommended during the initial imaging evaluation of the acute stroke patient, but should not delay IV alteplase if indicated.
    - For patients who qualify for IV alteplase according to guidelines from professional medical societies, initiating IV alteplase before noninvasive vascular imaging is recommended for patients who have not had noninvasive vascular imaging as part of their initial imaging assessment for stroke. Noninvasive intracranial vascular imaging should then be obtained as quickly as possible or at the receiving hospital if intracranial vascular imaging will add delay to transfer.
- Per ASA guidelines: for patients who otherwise meet criteria for ERT, it is reasonable to proceed with CTA if indicated in patients with suspected LVO before obtaining a serum creatinine concentration in patients without a history of renal impairment.
- If **LVO is identified** on imaging: immediate transfer with goal metrics as outlined above.
- If **no LVO is identified** on imaging: notify receiving hospital and transportation crew.
- All related documents should accompany all stroke patient transfers:
    - Diagnostics scans and reports if available
    - Hospital records
    - Medication Administration Record
- Untimely transfers may be reported to the NCTTRAC SPI Committee for review.

Hospital Triage from Inpatient Service

- All hospitals caring for stroke patients within a stroke system of care should develop, adopt and adhere to care protocols that reflect current care guidelines as established by national and international professional organizations and state and federal agencies and laws.
- Regional hospitals that may be transferring patients to other facilities should establish hand-off, transfer protocols and procedures that ensure safe and efficient patient care within and between facilities.
- Protocols for inter-hospital transfer of inpatients should be established and approved beforehand so that efficient patient transfers can be accomplished at all hours of the day and night.
- Regional hospitals that may be transferring patients to other facilities, should establish transfer protocols, terminology (code stroke), agreements and procedures that ensure safe and efficient patient care with EMS agencies that are capable of transportation via ground and air.
- In all patients within 24 hours from last known well that are suspected of having an acute ischemic stroke early identification of possible LVO is recommended.
    - Consider utilizing a stroke severity scale or NIHSS upon identification of an inpatient suspected of having a stroke.
        - Recommended stroke severity scale: Cincinnati Stroke Triage Assessment Tool (CSTAT), Field Assessment Stroke Triage for Emergency Destination (FAST-ED), Los Angeles Motor Scale (LAMS), Rapid Arterial Occlusion Evaluation Scale (RACE) or Vision, Aphasia, Neglect (VAN) Assessment.
- Early Notification of CSC (Level 1) and activation of EMS transport team.
    - Notify CSC (Level 1) and dispatch EMS transport team, crew should be on standby for transfer (prior to imaging), if LVO screen is positive and patient meets established criteria.
- It may be useful for primary stroke centers and other healthcare facilities that provide initial emergency care, including administration of IV alteplase, to develop the capability of performing emergency noninvasive intracranial vascular imaging to most appropriately select patients to transfer for endovascular intervention and to reduce the time to ERT.
    - **0-6 hours** from last known well: ERT eligibility will be based in part on demonstration of a LVO on CT angiogram of the head and neck.
    - **6-24 hours** from last known well: ERT eligibility will be based in part on demonstration of LVO on CT angiogram of head and neck and mismatch profile on CT perfusion, DW-MRI or MRI perfusion.
- Regional hospitals triaging stroke patients suspected of having an intracranial LVO (positive stroke severity screen), should consider concurrent vascular imaging with the noncontrast head CT.
    - **6-24 hours** from last known well consider CT perfusion, DW-MRI or MRI perfusion if capable.
- For patients who otherwise meet criteria for ERT, a noninvasive intracranial vascular study is recommended during the initial imaging evaluation of the acute stroke patient, but should not delay IV alteplase if indicated.

    - For patients who qualify for IV alteplase according to guidelines from professional medical societies, initiating IV alteplase before noninvasive vascular imaging is recommended for patients who have not had noninvasive vascular imaging as part of their initial imaging assessment for stroke. Noninvasive intracranial vascular imaging should then be obtained as quickly as possible.
- Per ASA guidelines: for patients who otherwise meet criteria for EVT, it is reasonable to proceed with CTA if indicated in patients with suspected LVO before obtaining a serum creatinine concentration in patients without a history of renal impairment.
- If **LVO is identified**: immediate transfer with goal metrics for inpatient as outlined above.
- If **no LVO is identified**: notify receiving hospital and transportation crew.
- All related documents should accompany all stroke patient transfers:
    - Diagnostics scans and reports if available
    - Hospital records
    - Medication Administration Record
- Untimely transfers may be reported to the NCTTRAC SPI Committee for review.

EMS Transportation for Inter-Hospital Care

- Stroke Patient Transport: Stroke patients in NCTTRAC are transported according to patient need, availability of air transport resources, and environmental conditions.
- Ground transport capable of providing appropriate level of care should be utilized based on patient needs. For instance, transportation via ALS or MICU ground ambulance should be considered for patients receiving IV rt-PA.
- All related documents should accompany all stroke patient transfers:
    - Diagnostics scans and reports if available
    - Hospital records
    - Medication Administration Record
- Transport teams should follow established transfer protocols and procedures to ensure safe and efficient patient care with the mindset that “time is brain”. **Because time from onset of symptoms to treatment has such a powerful impact on outcomes, there should be the same level of urgency during inter-hospital transfers as there is in EMS triage in the prehospital setting.**

Management

- Prevent aspiration, HOB > 30. Ensure airway patency with suctioning and OPA or NPA, as needed.
- Transportation team will monitor vitals and perform neuro assessments, such as an abbreviated NIHSS, at a minimum of every 15 minutes.
- Supplemental oxygen to keep oxygen saturation > 94%, maintain continuous monitoring.

- Monitor and treat blood pressure using appropriate parameters (post rt-PA, ICH or SAH). See **appendix B**.
- Blood pressure goal: patients **receiving IV rt-PA** infusion **BP <180/105**; patients **not eligible** for IV rt-PA **BP <220/120 mmHg** may be reasonable.
- Treat hypotension. Evaluate, document and treat signs/symptoms of shock according to the Shock CPG.
- Avoid dextrose containing fluids in non-hypoglycemic patients.
- If IV rt-PA infusion completes during transport, the remaining drug within the tubing should be infused using an infusion of normal saline at the same rate as the rt-PA infusion. Do not change the original set volume to be infused (VTBI) on the pump. When the VTBI alarms as complete, this will be the rt-PA infusion completion time.
- Monitor for signs of orolingual angioedema. Contact Medical Control should any signs or symptoms develop. See **appendix C** for management of orolingual angioedema associated with IV alteplase.
- Monitor for signs and symptoms of neurological deterioration. Worsening of neurological exam (NIHSS worsening of $\geq$4 points) could represent hemorrhagic conversion of the stroke or worsening ischemia. Contact Medical Control for guidance and send prenotification to the receiving hospital.

XIV. SYSTEM PERFORMANCE IMPROVEMENT

NCTTRAC participating organizations must have a performance improvement system for acute stroke patients.

Goals

The goal is to establish a method for monitoring and evaluating the performance of the NCTTRAC stroke system and the impact of the system development. NCTTRAC regional hospitals participating in the regional system of stroke care must have a separate performance improvement system for stroke patients. Continuous quality improvement processes, implemented by the stroke system as a whole will provide a means of improving patient care and outcomes.

Committees Charged

Responsibilities are charged to the NCTTRAC System Performance Improvement and Stroke Committees.

Objectives

- To provide a multidisciplinary forum for stroke care providers to evaluate stroke patient outcomes from a system perspective and to assure the optimal delivery of stroke care.

- To facilitate the sharing of information, knowledge and scientific data.
- To provide a process for medical oversight of regional stroke operations.
- Establish regional quality measures:
    - **Door-to-Needle**
    - **Door-to-Skin puncture**
    - **DIDO**

Discussion

In order to assess the impact of regional stroke development, system performance must be monitored and evaluated from an outcomes perspective. A plan for the evaluation of operations is needed to determine if system developments are meeting the stated goals.

Directions – The direction for the development of a NCTTRAC Regional QI program is derived from the Texas EMS Rules: Section 157.124 Regional EMS Trauma Systems: (2.K) of the EMS Rules (effective 2/17/92) requires the development of a "performance management program that evaluates outcome from a system perspective."

Authority - The authority and responsibility for regional quality improvement rests with the Regional Advisory Council. This will be accomplished in a comprehensive, integrated manner through the work of the Physician Advisory Group as well as the Stroke and EMS Committees.

- Scope & Process – The Stroke Committee with System Performance Improvement Committee and the Medical Directors Committee serve as the oversight committee for regional performance improvement. Referrals for follow-up and feedback to and from the EMS Committee and Providers ensure system-wide multidisciplinary performance improvement.
- The System Performance Improvement Committee, in consultation with the Stroke Committee, will determine the type of data and manner of collection, set the agenda for the PI process within the regularly-scheduled meetings of the committee, and identify the events and indicators to be evaluated and monitored. Indicator identification will be based on high risk, high volume and problem prone parameters. Indicators will be objective, measurable markers that reflect stroke resources, procedural/patient care techniques and/or systems/process outcomes.
- Occurrences will be evaluated from a system outcomes perspective and sentinel events will be evaluated on a case by case basis. Activities and educational offerings will be presented to address knowledge deficits and case presentations or other appropriate mediums will be designed to address systems and behavioral problems. All actions will focus on the opportunity to improve patient care and systems operation. The results from committee activities will be summarized and communicated to the RAC membership. Problems identified that require further action will be shared with the persons and entities involved for follow-up and loop closure. Committee follow-up and outcome reports will be communicated on a standard format.

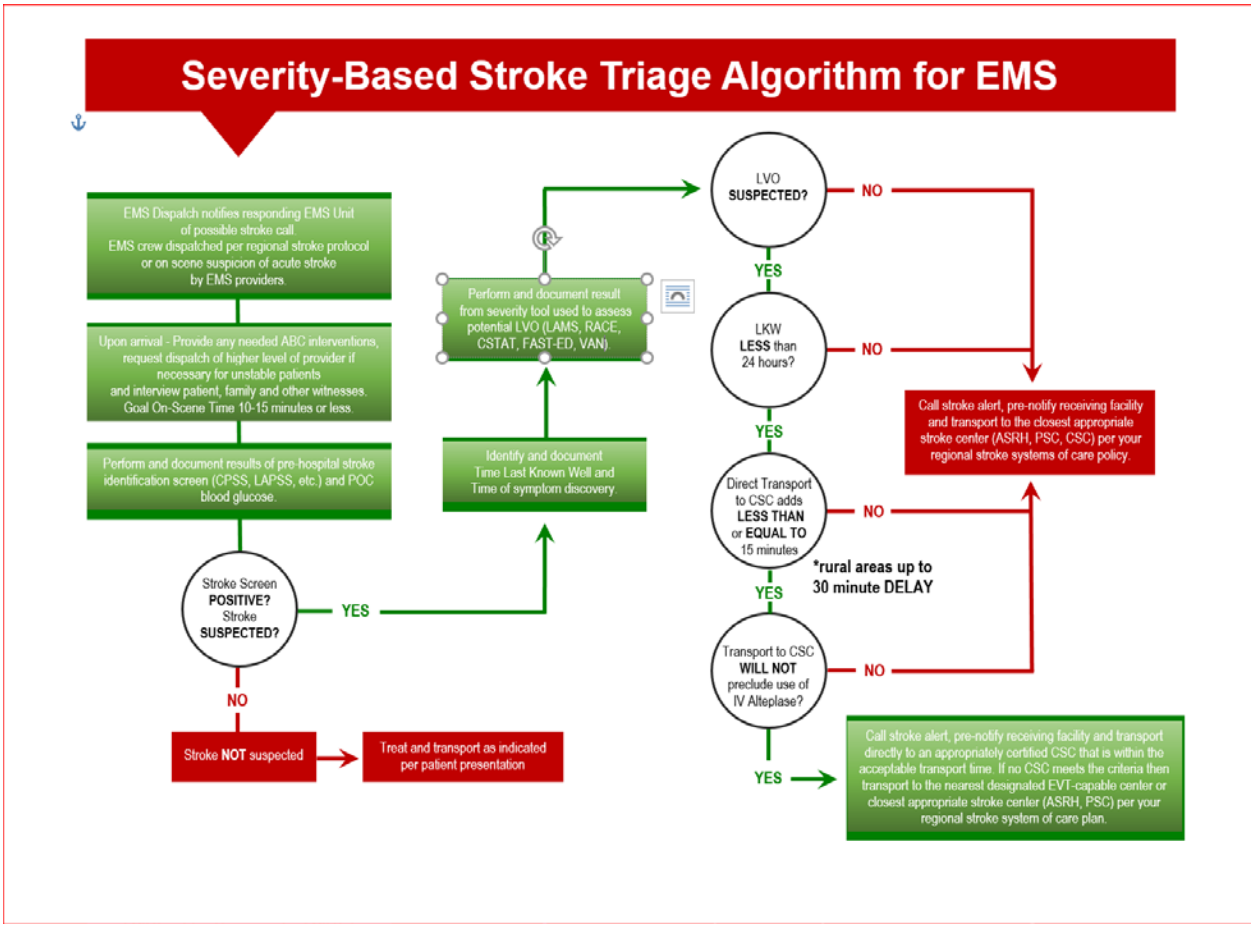
- The functions and effectiveness of NCTTRAC quality improvement process will be evaluated on an annual basis in conjunction with the annual evaluation of the NCTTRAC Bylaws. All PI activities and committee proceedings are strictly confidential. Individuals involved in performance management activities will not be asked to review cases in which they are review process.
- Hospitals will provide individual follow-up on acute stroke transports directly to the EMS agency transporting the patient.

Data Collection

- Participation in the RDC is recommended to promote consistent adherence to current treatment guidelines, to allow continuous regional quality improvement and to improve patient outcomes.
- Data will be shared with EMS by each certified/designated facility. Data sharing may occur within NCTTRAC.
- Summary reports are submitted for each NCTTRAC hospital facility and EMS provider.
- Sentinel events will be used to focus attention on specific situations/occurrences of major significance to patient care outcomes and be reviewed by System Performance Improvement Committee.
- Performance Improvement data is reviewed and updated annually.

Confidentiality - All information and materials provided and/or presented during

PI meetings are strictly confidential. Refer to System Performance Improvement committee for additional information.


Severity-Based Stroke Triage Algorithm for EMS
EMS Dispatch notifies responding EMS Unit of possible stroke call.
EMS crew dispatched per regional stroke protocol or on scene suspicion of acute stroke by EMS providers.
Upon arrival - Provide any needed ABC interventions, request dispatch of higher level of provider if necessary for unstable patients and interview patient, family and other witnesses. Goal On-Scene Time 10-15 minutes or less.
Perform and document results of pre-hospital stroke identification screen (CPSS, LAPSS, etc.) and POC blood glucose.
Stroke Screen POSITIVE? Stroke SUSPECTED?
YES
NO
Stroke NOT suspected
Treat and transport as indicated per patient presentation
Identify and document Time Last Known Well and Time of symptom discovery.
Perform and document result from severity tool used to assess potential LVO (LAMS, RACE, CSTAT, FAST-ED, VAN).
LVO SUSPECTED?
NO
YES
LKW LESS than 24 hours?
NO
YES
Direct Transport to CSC adds LESS THAN or EQUAL TO 15 minutes
NO
YES
*rural areas up to 30 minute DELAY
Transport to CSC WILL NOT preclude use of IV Alteplase?
NO
YES
Call stroke alert, pre-notify receiving facility and transport to the closest appropriate stroke center (ASRH, PSC, CSC) per your regional stroke systems of care policy.
Call stroke alert, pre-notify receiving facility and transport directly to an appropriately certified CSC that is within the acceptable transport time. If no CSC meets the criteria then transport to the nearest designated EVT-capable center or closest appropriate stroke center (ASRH, PSC) per your regional stroke system of care plan.

2018 ASA Recommendation: Options to Treat Arterial Hypertension in Patients with AIS Who Are Candidates for Acute Reperfusion Therapy

Class IIb, LOE C-EO				
	Drug	**Starting dose**	**Titration**	**Maximum dose**
Patient eligible for acute reperfusion therapy except that BP > 185/110 mm Hg **If BP is not maintained ≤185/110 mm Hg, do not administer Alteplase**	Labetalol	10-20 mg IV over 1-2 minute	may repeat 1 time	
	Nicardipine	5 mg/hour IV	titrate up by 2.5 mg/hour every 5-15 minute	15 mg/hour
	Clevidipine	1-2 mg/hour IV	titrate by doubling the dose every 2-5 minutes	21 mg/hour
	Other drugs (eg hydralazine, enalaprilat) may also be considered			
If systolic BP >180-230 mm Hg or diastolic BP >105-120 mm Hg	Labetalol	10 mg IV followed by continuous infusion	2-8 mg/minutes	
	Nicardipine	5 mg/hour IV	titrate up by 2.5 mg/hour every 5-15 minute	15 mg/hour
	Clevidipine	1-2 mg/hour IV	titrate by doubling the dose every 2-5 minutes	21 mg/hour
	If BP not controlled or diastolic BP >140 mm Hg, consider IV sodium nitroprusside			
Management of BP during and after Alteplase or other acute reperfusion therapy to maintain BP ≤180/105 mmHg				
Monitor BP every 15 minutes for 2 hours from the start of Alteplase therapy, then every 30 minutes for 6 hours, and then every hour for 16 hours.				

2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

2018 ASA Recommendation: Management of Orolingual Angioedema Associated With IV Alteplase Administration for AIS

Class IIb, LOE C-EO	
1. Maintain airway	Endotracheal intubation may not be necessary if edema is limited anterior tongue and lips.
	Edema involving larynx, palate, floor of mouth, or oropharynx with rapid progression (within 30 minutes) poses higher risk of requiring intubation.
	Awake fiberoptic intubation is optimal. Nasal-tracheal intubation may be required but poses risk of epistaxis post-IV Alteplase. Circothyroidotomy is rarely needed and also problematic after IV Alteplase.
2. Discontinue IV Alteplase infusion and hold ACE inhibitors	
3. Administer IV methylprednisolone 125 mg	
4. Administer IV diphenhydramine 50 mg	
5. Administer ranitidine 50 mg IV or famotidine 20 mg IV	
6. If there is further increase in angioedema, administer epinephrine (0.1%) 0.3 mL subcutaneously or by nebulizer 0.5 mL	
7. Icatibant, a selective bradykinin B_2 receptor antagonist, 3 mL (30 mg) subcutaneously in abdominal area; additional injection of 30 mg may be administered at intervals of 6 hours not to exceed total of 3 injections in 24 hours; and plasma-derived C1 esterase inhibitor (20 IU/kg) has been successfully used in hereditary angioedema and ACE inhibitor-related angioedema	
8. Supportive care	

2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

I. Background

The North Central Texas Trauma Regional Advisory Council (NCTTRAC) is an organization designed to facilitate the development, implementation, and operation of a comprehensive trauma care system based on accepted standards of care to decrease morbidity and mortality. The Air Medical Committee for the North Central Texas Trauma Regional Advisory Council is a standing committee that provides recommendations and guidance for air medical operations in the Trauma Service Area - E (TSA-E). It is the mission of the Air Medical Committee to promote safe, ethical, and high-quality patient care during air medical transport for the citizens of Texas.

The purpose of a Regional Advisory Council (RAC) is to develop, implement, and monitor a regional emergency medical service trauma system plan within a TSA. A RAC is an organized group of healthcare entities and other concerned citizens who have an interest in improving and organizing trauma care within a specified Trauma Service Area. RAC membership may include hospitals, physicians, nurses, EMS providers, rehabilitation facilities, dispatchers, as well as other community groups. Regional Advisory Council objectives are to reduce the incidence of trauma through education, data collection and analysis and performance improvement. This is accomplished by providing educational programs and conducting performance improvement efforts that provide every provider guidance and motive to reduce the incidence of trauma as well as improve the outcome of trauma patients.

II. Purpose

The purpose of this document is to:

A. Define the system established by the TSA-E Air Medical programs to assist EMS ground providers and facilitate requesting the closest appropriate aircraft for the patient in need
B. Describe the review request process and specific indicators for systems performance improvement
C. Improve patient care, collaboration, and foster a community partnership for all stakeholders within the RAC

III. Desired Outcomes

The desired outcome is to request the closest appropriate aircraft and integrate air medical providers into the RAC System Performance Improvement (SPI) process. This provides a platform for concerns regarding air medical services to be identified, addressed, and provided a mechanism for loop closure within the Regional Advisory Council. This should occur when they are unsuccessful in being addressed among corporate entities. The intent is not to replace interworking collaboration among Air Medical and EMS services or care facilities.

A. Concerns regarding the air medical service(s) may include: safety, patient care, dispatching, or membership services.
B. The Air Medical Committee recommends that the evaluation of appropriate use of a helicopter rests with the requesting organization.
C. Performance improvement may include, educational initiatives, process improvement plans and/or recommendations from the NCTTRAC and/or GETAC Air Medical Committees.

IV. Process to Locate, Request, Communicate, And Improve Air Medical Services

A. EMResource is a software system that will publish all aircraft in TSA-E, their location, and availability. You can view this in a list or map view.

B. Obtain a facility or personal login by creating a support ticket with NCTTRAC

1. Go to https://www.ncttrac.org/
2. On the top right select Support
3. Start a Ticket
4. Choose "Support – Other"
5. Then fill in the needed fields and state that your agency needs a log in for EMResource

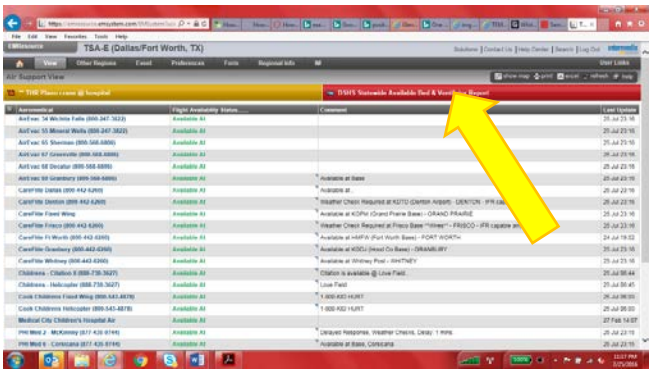
C. Once Log In is attained, go to https://emresource.emsystem.com/login.htm

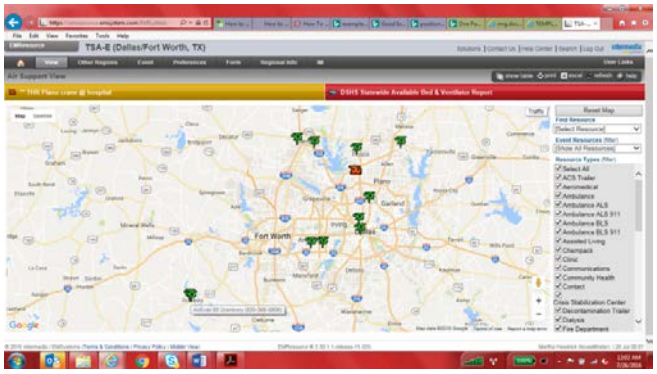
D. You will see a list of area helicopters, hospitals, EMS and their status (set up a preferred view and notifications so the system is what you need).

E. Find the **table view** and list of helicopters (pictured below on the left). It will state in GREEN "Available at" if available for a call and the location (usually "at base") or RED "Unavailable" if on a flight or out of service for a Maintenance Event.

F. Change and set the helicopter **map view** as your preference (yellow arrow indicates where to change the view, the map view is pictured below on the right). It is a very quick view with the helicopters mapped in their locations (hovering over or clicking on the icon will identify the aircraft). They are colored for their availability:

GREEN=Available
RED=Unavailable for a patient flight





G. All aircraft in your area can be viewed and you will be able to identify the closest available aircraft to your location and call the appropriate provider.

Radio **communication for Ground to Air**, will occur utilizing the preferred contact method and channel as designated by the requesting ground agency, either at the time of the activation or through prearranged channel designation with the Air Provider. In the event of a disaster or MCI situation, the Texas Statewide Interoperability Channel Plan should be implemented. This plan states that radio communication from Ground to air, authorized by the Texas Government Code and regulated by the FCC, is to be performed on radio channel VMED 28. (see below)

Label	Receive	Transmit	Station Class	CTCSS RX /TX	Use
VMED28	155.3400	155.3400	FBT / MO	CSQ / 156.7	Tactical Channel

H. **Air Medical Indicators** to be referred to SPI Committee **if not met**:
   1. Air Medical Services will provide a **launch location of the aircraft responding**
   2. Air Medical Providers participating in the NCTTRAC are operating **on EMResource tracking map**, **updating and refreshing the aircraft current positions** at least every 3 minutes.
   3. **ETE** (flight time only) will not exceed **5 minutes past time given**
   4. **ETA** (includes lift time) will not exceed **5 minutes past time given**
   5. Air Medical Services **scene times will not exceed 20 minutes** (does not include specialty teams)
   6. Air Medical Services **inter-facility transfer times will not exceed 40 minutes** (does not include specialty teams)
   7. Provide air medical transport response for inter-facility trauma patients within 60 minutes of the time of the request

I. If an **indicator falls outside** of the above parameters, the event **may be submitted to the NCTTRAC SPI Committee** for review and it may be referred from SPI to the appropriate Committee and Individual Provider for action.

J. Process for requesting reviews and/or reporting concerns to the SPI Committee:
   1. Go to https://www.ncttrac.org/
   2. On the bottom right select Create A Helpdesk Ticket
   3. Start a Ticket
   4. Choose “Member – SPI Referral Form Request”
   5. Then fill in the necessary fields. Be as specific as possible to allow for a sufficient review.