



2016 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

The mission of the North Central Texas Trauma Regional Advisory Council (NCTTRAC) Stroke Committee is to create a system that reduces the burden of stroke within the community through an organizational effort of prevention, acute care and rehabilitation. Reduction in stroke morbidity and mortality will be achieved by developing and maintaining integrated quality processes in patient care and education.

Vision

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

Organization

One of the North Central Texas Regional Advisory Council (NCTTRAC) goals is to provide the infrastructure and leadership necessary to sustain a stroke treatment and transfer system within the designated nineteen county regions and to improve the level of care provided to persons living or traveling through this region. Together, through the work of its standing committees, NCTTRAC member organizations (hospitals, first responder organizations, EMS providers, air medical providers, emergency management, public health, etc.) work cooperatively to ensure that quality care is provided to stroke patients, stroke awareness and education to the public, as well as stroke education to health care providers throughout the region.

Regional Plan

This plan has been developed in accordance with generally accepted stroke guidelines, procedures for implementation of a comprehensive Emergency Medical Services (EMS) and stroke system plan. This plan does not establish a legal standard of care, but rather is intended as an aid to decision-making in stroke patient care scenarios. It is not intended to supersede the physician's prerogative to order treatment.

II. STROKE SYSTEM OF CARE GOALS

The purpose of the Stroke Committee shall be to facilitate the development, implementation, and operation of a comprehensive stroke system based on accepted standards of care to decrease morbidity and mortality related to stroke. NCTTRAC will solicit participation from health care facilities, organizations, entities and professional societies involved in health care. NCTTRAC will encourage multi-community participation in providing stroke care, work to promote improvement of facilities and services, and cooperate with all member entities, agencies and organizations in the establishment of an efficient system of stroke care. NCTTRAC shall develop a plan for a regional comprehensive stroke system that meets the requirements of the Texas Department of State Health Services (DSHS):

- Identify and integrate resources to foster commitment and cooperation in developing a stroke system of care.
- Identify leverage tactics to promote EMS, hospital and rehabilitation provider participation.
- Establish system coordination relating to access, protocols/procedures, and referrals. These structures will establish continuity and uniformity of care among the providers of stroke care.
- Promote internal communication as the mechanism for system coordination which will include the EMS providers, hospitals and members of the NCTTRAC Stroke Committee.
- Create uniform stroke system standards and implement rigorous continuous quality improvement programs that address patients' needs, outcomes, and opportunities for improvement.
- Provide EMS and nursing staff education to the members of the NCTTRAC

III. RECOGNITION OF STROKE FACILITIES

Goal

To support the DSHS system by which NCTTRAC hospitals may seek state designation as a stroke facility. NCTTRAC will not designate stroke facilities at any level, but may set minimum standards for what is considered “active participation.”

- A facility interested in seeking state designation as a Stroke Center (Level I, II, or III) must apply to the Texas Department of State Health Services (DSHS).
 - The application will include a Letter of Participation from NCTTRAC.
 - The application will also include additional documentation as defined by Texas DSHS.
- NCTTRAC Letters of Participation for initial or renewal designation as Texas DSHS Stroke Centers may require additional NCTTRAC participation requirements according to procedures as defined in the NCTTRAC Bylaws or Standard Operating Procedures. This criterion may include, but not be limited to, minimum participation requirements in the Stroke Committee meetings and stroke patient registry data submission requirements.
- The NCTTRAC Stroke Committee may set performance improvement (PI) filters for data. If a NCTTRAC member stroke facility’s performance measures fall below specified benchmarks, the PI measures will be forwarded to the NCTTRAC SPI Committee for review as noted in the Stroke SOP

Texas DSHS Stroke Center Designations

- Level 1:** Comprehensive Stroke Centers will meet the requirements of a Primary Stroke Center and those specified in the Consensus Statement on Comprehensive Stroke Centers.
- Level 2:** Primary Stroke Centers will meet the requirements specified in “Recommendations for the Establishment of Primary Stroke Centers.”
- Level 3:** Stroke Support Facilities will meet the requirements defined by the Acute Care Committee of GETAC (the Governor’s EMS, Trauma, and Acute Care Advisory Council).

Notification requirements

Designated stroke facilities failing to meet and/or maintain critical essential criteria outlined below shall provide notification within 5 days to NCTTRAC, EMS providers and the healthcare facilities from which it receives stroke transfers. Failure to meet the following essential criteria must be reported:

- Neurosurgery capabilities (Level 1)
- Neuro-interventional capabilities (Level 1)
- Neurology capabilities (Level 1, Level 2)
- Anesthesiology (Level 1)

- Emergency physicians (All levels)
- Stroke medical director (All levels)
- Stroke nurse coordinator/program manager (All levels)
- Stroke registry (All levels)

If the facility chooses to relinquish or change its stroke designation, it shall provide at least 30 days notice to the NCTTRAC and the DSHS office.

IV. STROKE PREVENTION

Goal

Educate community on stroke signs/symptoms, prevention, and access to the system for emergency care.

Committee Charge

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

Objective

The NCTTRAC stroke system stakeholders (EMS and facilities) will partner to conduct health education, public awareness, and community outreach on the emergent care of stroke and its prevention. The regional activities will be coordinated with those among other organizations.

V. SYSTEM ACCESS

Goal

The goal for system access within Trauma Service Area (TSA) E is two-fold. First, rapid access to notification of the need for emergency stroke care at any location within TSA-E must be available to all persons in the Region. Second, Emergency Medical Services (EMS) must be rapidly available to provide quality health care to ill persons in each NCTTRAC Community. In portions of this region, First Responder Organizations (FRO) may provide initial treatment pending EMS arrival.

Committee Charge

Responsibilities charged to the NCTTRAC Emergency Medical Services (EMS) Committee and the Emergency Department Operations Committee in coordination with the NCTTRAC Stroke Committee.

Objective

One of the primary elements of an EMS/Stroke system is to provide easy and rapid access to EMS. 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.

VI. COMMUNICATIONS

Goal

All EMS communications systems must provide the means by which emergency resources can be accessed, mobilized, managed, and coordinated. EMS must provide verbal notification to receiving stroke facility of incoming acute stroke patient transports in order for the facility to activate their acute stroke protocol.

Committee Charge

Responsibilities charged to the NCTTRAC Emergency Medical Services (EMS) Committee, Emergency Department Operations Committee and the NCTTRAC Stroke Committee.

Objective

TSA-E encourages 100% participation from all EMS agencies within the nineteen counties that comprise the RAC area. By enhancing participation, the RAC can identify quality issues related to response times. The 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. All of the physicians should not only be clinically qualified in their area of clinical practice, but should have expertise and competence in the treatment of stroke patients. The regional stroke system of care will be developed under the direction of representatives of NCTTRAC medical staff throughout the region who will ensure appropriate medical oversight of all pre-hospital care providers through a Quality Performance Improvement (PI) process. NCTTRAC will have oversight through the EMS Committee and the SPI Committee.

Committee Charge

Responsibilities charged to the NCTTRAC Emergency Medical Services (EMS) Committee, the NCTTRAC Stroke Committee, and the Physicians Advisory Group.

Objectives

Medical oversight is necessary to help ensure that EMS is delivering appropriate and quality services that best meet the needs of the community. If unable to accommodate certain patients based on the nature of their illness or due to temporary unavailability of necessary therapies, beds or resources, EMS agencies may utilize EMResource to assist in transport decision-making. This practice is for the purpose of re-directing such patients to appropriate medical care so that patient care can be optimized. The rerouting of patients for financial reasons is not the intent of this policy, nor the intent of the Regional System of Stroke Care.

Physician Involvement in Regional Plan Development - The Physician Advisory Group meets on a periodic basis to conduct its usual business and to review and make recommendations for regional planning coordination, components, policies, and protocols 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. Any interested NCTTRAC physician is invited to attend these meetings. Through the efforts of the NCTTRAC Physician Advisory Group, the RAC will continue to work towards developing consistency and standardization of the protocols used within our region and to carry out regional quality improvement activities and treatment recommendations.

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 printed and distributed to all EMS providers for incorporation into local protocols. Those medical directors have signed a form verifying that they are following the minimum NCTTRAC guidelines for the treatment of patients within their area. These forms are updated and maintained in the NCTTRAC office. Periodic reviews and updates are completed and upon approval are distributed as necessary. These protocols serve as a baseline and individual Medical Directors may adapt for their local community.

EMResource is the official means by which hospitals can update EMS agencies as to their official DSHS stroke designation level. It is the responsibility of DSHS stroke designated facilities to maintain an accurate status reflecting the actual level of designation by law. Additionally, it is the responsibility of EMS agencies to check EMResource to know if a facility is designated or if the facility is experiencing any issues that could affect its ability to care for the stroke patient.

This does not prevent any EMS Medical Director from making patient destination decisions in the best interest of patient care.

Regional Stroke Treatment Pre Hospital.

Guidelines

- Assess and support ABCs
- Rapid Transport to the most appropriate stroke facility using the NCTTRAC EMS Field Triage and Transport Guidelines.
- Obtain LKN and onset symptoms
- Place patient in position of comfort or in left lateral decubitus position with head elevated no more than 30 degrees. If evidence of shock, place the patient supine with the feet elevated and monitor airway closely.
- Administer oxygen as needed to maintain SpO₂ of >94%.
- Perform a finger stick blood glucose analysis and treat hypoglycemia if present per individual EMS **Altered Level of Consciousness Guidelines**.
- Complete a Prehospital Stroke Scoring Tool (any published stroke scale score or NCTTRAC EMS Stroke Field and Triage Guidelines) See attached stroke scoring tools Establish IV access at a TKO rate or use a saline lock preferred 2 large bore IV's AC.
- Apply ECG and monitor continuously until arrival at hospital. Treat arrhythmias per the individual EMS **Arrhythmia Guidelines**.
- Apply ETCO₂, if available, and monitor if respiratory distress or shock is present or develops.
- Family contact cell phone numbers
- Treat blood pressure according to the individual EMS Hypertension guidelines.
- Pre Hospital Stroke Notification
- EMS Field Blood Draws if available
- (CBC, BMP, PT/INR)

VIII. PRE-HOSPITAL TRIAGE CRITERIA

Goal

Patients will be identified, rapidly and accurately assessed, and based on identification of their actual or suspected onset and severity of symptoms and last known well are transported to the nearest appropriate designated stroke facility.

Committee Charge

Responsibilities charged to the NCTTRAC Emergency Medical Services (EMS) Committee, Physicians Advisory Group, Emergency Department Operations and Stroke Committee

Purpose

The pre-hospital triage plan serves to direct the regional triage of adult stroke patients to the facility most appropriate based upon the duration of stroke symptoms. This plan instructs EMS to transport patients to the most appropriate level stroke facility, if available, within the region.

Criteria

- Transport to the highest level facility available is permitted, but not mandated, as long as transport to higher level facility required < 15 minutes additional transport time. Paramedic and EMS Medical Control discretion should be based upon clinical scenario (time of onset and clinical deficit) and regional stroke facility capabilities.
- Unless immediate intervention (ABC's, cardiac arrest, etc.) is required, stroke patients (symptom onset >3.5 hour and < 12 hour) should preferentially be taken to a Level 1 (comprehensive) facility, if available with < 15 minutes additional transport time. The preferential transport to Level 1 (comprehensive) facility is most applicable to stroke patients with severe deficit and suspected large vessel blockage (LAMS or comparable stroke scalesince these patients may be the best candidates for endovascular therapy. (This includes wake up strokes)
- Stroke patients with onset greater than 24 hours should be taken to the closest acute care hospital for treatment.
- A hemorrhagic stroke should be suspected if the patient's symptoms include sudden severe headache or coma. If a hemorrhagic stroke is suspected, transport to a Level 1 CSC

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- If the ground transportation to a Level 1 or Level 2 adds > 15 minutes to the transportation time, if ground transportation time is greater than 30 minutes, or if lifesaving interventions (e.g. airway stabilization, control of hypertensive crisis, etc.) are required for safe transport, recommend helicopter transport to the nearest agreed upon landing zone or take the patient to the nearest medical facility to arrange for helicopter transport.

IX. System Definitions

- 1) **Level 1:** Comprehensive Stroke Centers (“CSCs”) will meet the requirements specified in the Consensus Statement of Stroke on Comprehensive Stroke Centers. (Recommendations for Comprehensive Stroke Centers: a consensus statement from the Brain Attack Coalition). These include, but are not limited to, the following specifications:
 - a. A 24/7 stroke team capability as defined herein, as well as all of the requirements specified for a Primary Stroke Center
 - b. Personnel with expertise to include vascular neurology, neurosurgery, neuroradiology, interventional neuroradiology/endovascular physicians, critical care specialists, advanced practice nurses, rehabilitation specialists with staff to include physical, occupational, speech, and swallowing therapists, and social workers.
 - c. Advanced diagnostic imaging techniques such as magnetic resonance imaging (MRI), computerized tomography angiography (CTA), digital cerebral angiography and transesophageal echocardiography.
 - d. Capability to perform surgical and interventional therapies such as stenting and angioplasty of intracranial vessels, carotid endarterectomy, aneurysm clipping and coiling, endovascular embolization of vascular malformations and intra-arterial reperfusion therapy.
 - e. Supporting infrastructure such as 24/7 operating room support, specialized critical care support, 24/7 interventional neuroradiology/endovascular support, and stroke registry.
 - f. Educational and research programs
- 2) **Level 2:** Primary Stroke Centers (“PSCs”) will meet the requirements specified in “Recommendations for the Establishment of Primary Stroke Centers”. They will be able to deliver stroke treatment 24/7. These include, but are not limited to, the following specifications:
 - a. 24-hour stroke team
 - b. Written care protocols
 - c. EMS agreements and services
 - d. Trained ED personnel
 - e. Dedicated stroke unit
 - f. Neurosurgical, Neurological, and Medical Support Services
 - g. Stroke Center Director that is a physician
 - h. Neuroimaging services available 24 hours a day
 - i. Lab services available 24 hours a day

- j. Outcomes and quality improvement plan
 - k. Annual stroke CE requirement
 - l. Public education program
- 3) **Level 3:** Support Stroke Facilities (“SSFs”) provide timely access to stroke care but may not be able to meet all the criteria specified in the Level 1(CSCs) and Level 2 (PSCs) guidelines. They are required to:
- a. Develop a plan specifying the elements of operation they do meet.
 - b. Have a Level 1 or Level 2 center that agrees to collaborate with their facility and to accept their stroke patients where they lack the capacity to provide stroke treatment.
 - c. Identify in the plan the Level 1 or Level 2 center that has agreed to collaborate with and accept their stroke patients for stroke treatment therapies the SSF are not capable of providing
 - d. Obtain a written agreement between the Level 1 or Level 2 Stroke Center with their facility specifying the collaboration and interactions.
 - e. Develop written treatment protocols which will include at a minimum:
 - 1. Transport or communication criteria with the collaborating/accepting Level 1 or Level 2 center.
 - 2. Protocols for administering thrombolytics and other approved acute stroke treatment therapies.
 - f. Obtain an EMS/RAC agreement that:
 - 1. Clearly specifies transport protocols to the SSF, including a protocol for identifying and specifying any times or circumstances in which the center cannot provide stroke treatment; and,
 - 2. Specifies alternate transport agreements that comply with GETAC EMS Transport protocols.
 - g. Document ED personnel training in stroke.
 - h. Designate a stroke director (this may be an ED physician or non-Neurologist physician)
 - i. Employ the NIHSS for the evaluation of acute stroke patients administered by personnel holding current certification
 - j. Clearly designate and specify the availability of neurosurgical and interventional neuroradiology/endovascular services.
 - k. Document access and transport plan for any unavailable neurosurgical services within 90 minutes of identified need with collaborating Level 1 or 2 Stroke Center.

The designation of a Level 3 Center is defined to allow timely access to acute stroke care that would not otherwise be available such as in rural situations where transportation and access are limited and is intended to recognize those models that deliver standard of care in a quality approach

utilizing methods commonly known as “drip and ship” and telemedicine approaches.

X. HELICOPTER ACTIVATION

Goal

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

Committee Charge

Responsibilities charged to the NCTTRAC Air Medical Committee, Emergency Medical Services (EMS) Committee, Physicians Advisory Group, Emergency Department Operations Committee and the Stroke Committee.

Decision Criteria

Helicopter activation/scene response may be considered when it can reduce transportation time for patients with onset of symptoms less than 24 hours.

Helicopter crew transports to the most appropriate designated Stroke hospital.

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XI. FACILITY STATUS on EMResource

Goal

NCTTRAC stroke facilities will communicate facility status promptly and clearly to other facilities through EMResource in order to ensure that stroke patients are transported to the nearest appropriate stroke facility. Examples such as: diagnostic imaging availability, neurosurgery availability, or neuro intensive care bed availability

Responsibilities charged to the NCTTRAC EMS Committee, Physicians Advisory Group, Emergency Department Operations and the Stroke Committee.

- Regional stroke care challenges associated with facility “closure” or the emergency department (ED) saturation status will be assessed through the System Performance Improvement Committee QI process.
- All facilities and pre-hospital providers will use EMResource to notify and track closure and ED saturation status.

XII. FACILITY TRIAGE CRITERIA

Goal

The goal of establishing and implementing facility criteria in NCTTRAC is to ensure that all regional hospitals use standard definitions to classify stroke patients in order to ensure uniform patient reporting and facilitate inter-hospital transfer decisions. Patients must be rapidly identified and transported to the appropriate level of care based on clinical need so that time-dependent interventions may be performed. Triage is the classification of patients according to medical necessity. Reduction of stroke morbidity requires emergent evaluation and treatment.

When “in hospital” strokes are identified, should a higher level of care be needed, transfer arrangements should be made to transport the stroke to the highest level of care for optimum outcome.

Committee Charge

Responsibilities charged to the NCTTRAC Stroke Committee, Emergency Department Operations Committee and Physicians Advisory Group.

Objectives

Facility Triage will ensure that each stroke patient is identified, rapidly and accurately assessed based on identification and classification of their actual or suspected onset of symptoms and time of last know well. It is also intended to ensure the prompt availability of medical resources needed for optimal patient care at the receiving stroke facility.

- To develop and implement a system of standardized stroke patient classification definitions.
- Create and maintain a registry of the number, level, and destination of acute stroke patients transported

XIII. INTER-HOSPITAL TRANSFERS

Goal

The goal for establishing and implementing inter-hospital transfer criteria in NCTTRAC is to ensure that those stroke patients requiring additional or specialized care and treatment beyond a facility's capability are identified and transferred to the most appropriate facility as soon as possible.

Committee Charge

Responsibilities charged to the NCTTRAC Stroke Committee and Physicians Advisory Group.

Objectives

- To ensure that all regional hospitals make transfer decisions based on standard definitions which classify stroke patients according to NCTTRAC facility triage criteria.
- To identify stroke treatment and specialty facilities within NCTTRAC.
- To establish treatment and stabilization criteria and time guidelines for NCTTRAC patient care facilities.

Discussion

- The level of healthcare resources required for acute care patients is outlined in the NCTTRAC pre-hospital triage criteria. When an in house stroke patient is identified, a Code Stroke should be initiated. A transferring facility shall state that the patient is a "Code Stroke" when calling EMS and the accepting Certified/Designated Stroke Center.
- The time guideline for stroke patient transfers in TSA-E is to transfer stroke patients with an onset window of <24hours immediately to the closest Level 1 (comprehensive) or Level 2 (primary) utilizing Code Stroke alert when calling for acceptance.
- Identification of Stroke Patients & Stroke Transfers –Stroke patients, with special needs, may be initially transferred to a Level 1 or Level 2 Stroke Center for assessment and treatment as deemed appropriate based on the clinical needs of the patient. All related documents including diagnostics scans will accompany all stroke patient transfers. This includes start and stop times of all medications given. All stroke transfers will be expedited and initiated within one hour of identification

of the stroke. Untimely transfers may be reported to the NCTTRAC SPI Committee for review.

- Inpatient to Inpatient transfers need to occur as quickly as possible and within a two-hour time frame in order to provide timely care by the receiving CSC, Level 1 center.
- Stroke Patient Transport – Stroke patients in NCTTRAC are transported according to patient need, availability of air transport resources, and environmental conditions. Ground transport via ALS or MICU ground ambulance is available throughout the Region. Air and ground transport will monitor the acute stroke patients by obtaining: every 15 minute vital signs and neuro assessments (LAMS or other published neuro assessment scores), monitor for angioedema, monitor blood pressure using appropriate parameters (post tPA, ICH, or SAH).

XIV. SYSTEM PERFORMANCE IMPROVEMENT

The facility must have a continuous performance improvement (PI) system for stroke cases. Additionally, the facility must participate in NCTTRAC Regional Stroke PI.

Goals

The goals for systems performance improvement in NCTTRAC are to establish a method for monitoring and evaluating system performance over time and to assess the impact of stroke system development.

Committee Charge

Responsibilities charged to the NCTTRAC System Performance Improvement Committee and Stroke Committee.

Objectives

- To identify regional stroke data filters which reflect the process and outcome of the NCTTRAC stroke system of care.
- 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.

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, and the Stroke and EMS Committees.
 - **Scope & Process** – The Stroke Committee with System Performance Improvement Committee and the Physician Advisory Group 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

professionally involved, but will be given the opportunity to participate in the review process.

- Hospitals will provide individual follow-up on acute stroke transports directly to the EMS agency transporting the patient.
- **Data Collection** –
 - 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 (SPI) Committee.
 - PI data is reviewed and updated annually
- **Confidentiality** - All information and materials provided and/or presented during PI meetings are strictly confidential.
- NCTTRAC facility and EMS provider data related to the following PI indicators for referred cases are reviewed during the monthly System Performance Improvement meetings. The current SPI Form is available on the NCTTRAC website and is evaluated annually.

CINCINNATI PREHOSPITAL STROKE SCALE

Facial Droop

- Normal: Both sides of face move equally
Abnormal: One side of face does not move at all

Arm Drift

- Normal: Both arms move equally or not at all
Abnormal: One arm drifts compared to the other

Speech

- Normal: Patient uses correct words with no slurring
Abnormal: Slurred or inappropriate words or mute

References

Kothari RU, Pancioli A, Liu T, Brott T, Broderick J. "Cincinnati Prehospital Stroke Scale: reproducibility and validity."
Ann Emerg Med 1999 Apr;33(4):373-8

N I H STROKE SCALE

Patient Identification. _____-_____-_____

Pt. Date of Birth ____/____/____

Hospital _____(____-____)

Date of Exam ____/____/____

Interval: Baseline 2 hours post treatment 24 hours post onset of symptoms ±20 minutes 7-10 days
 3 months Other _____(____)

Time: ____:____ []am []pm

Person Administering Scale _____

Administer stroke scale items in the order listed. Record performance in each category after each subscale exam. Do not go back and change scores. Follow directions provided for each exam technique. Scores should reflect what the patient does, not what the clinician thinks the patient can do. The clinician should record answers while administering the exam and work quickly. Except where indicated, the patient should not be coached (i.e., repeated requests to patient to make a special effort).

Instructions	Scale Definition	Score
<p>1a. Level of Consciousness: The investigator must choose a response if a full evaluation is prevented by such obstacles as an endotracheal tube, language barrier, orotracheal trauma/bandages. A 3 is scored only if the patient makes no movement (other than reflexive posturing) in response to noxious stimulation.</p>	<p>0 = Alert; keenly responsive. 1 = Not alert; but arousable by minor stimulation to obey, answer, or respond. 2 = Not alert; requires repeated stimulation to attend, or is obtunded and requires strong or painful stimulation to make movements (not stereotyped). 3 = Responds only with reflex motor or autonomic effects or totally unresponsive, flaccid, and areflexic.</p>	_____
<p>1b. LOC Questions: The patient is asked the month and his/her age. The answer must be correct - there is no partial credit for being close. Aphasic and stuporous patients who do not comprehend the questions will score 2. Patients unable to speak because of endotracheal intubation, orotracheal trauma, severe dysarthria from any cause, language barrier, or any other problem not secondary to aphasia are given a 1. It is important that only the initial answer be graded and that the examiner not "help" the patient with verbal or non-verbal cues.</p>	<p>0 = Answers both questions correctly. 1 = Answers one question correctly. 2 = Answers neither question correctly.</p>	_____
<p>1c. LOC Commands: The patient is asked to open and close the eyes and then to grip and release the non-paretic hand. Substitute another one step command if the hands cannot be used. Credit is given if an unequivocal attempt is made but not completed due to weakness. If the patient does not respond to command, the task should be demonstrated to him or her (pantomime), and the result scored (i.e., follows none, one or two commands). Patients with trauma, amputation, or other physical impediments should be given suitable one-step commands. Only the first attempt is scored.</p>	<p>0 = Performs both tasks correctly. 1 = Performs one task correctly. 2 = Performs neither task correctly.</p>	_____
<p>2. Best Gaze: Only horizontal eye movements will be tested. Voluntary or reflexive (oculocephalic) eye movements will be scored, but caloric testing is not done. If the patient has a conjugate deviation of the eyes that can be overcome by voluntary or reflexive activity, the score will be 1. If a patient has an isolated peripheral nerve paresis (CN III, IV or VI), score a 1. Gaze is testable in all aphasic patients. Patients with ocular trauma, bandages, pre-existing blindness, or other disorder of visual acuity or fields should be tested with reflexive movements, and a choice made by the investigator. Establishing eye contact and then moving about the patient from side to side will occasionally clarify the presence of a partial gaze palsy.</p>	<p>0 = Normal. 1 = Partial gaze palsy; gaze is abnormal in one or both eyes, but forced deviation or total gaze paresis is not present. 2 = Forced deviation, or total gaze paresis not overcome by the oculocephalic maneuver.</p>	_____

N I H STROKE SCALE

Patient Identification. _____-_____-_____

Pt. Date of Birth ____/____/____

Hospital _____(____-____)

Date of Exam ____/____/____

Interval: Baseline 2 hours post treatment 24 hours post onset of symptoms ±20 minutes 7-10 days
 3 months Other _____(____)

<p>3. Visual: Visual fields (upper and lower quadrants) are tested by confrontation, using finger counting or visual threat, as appropriate. Patients may be encouraged, but if they look at the side of the moving fingers appropriately, this can be scored as normal. If there is unilateral blindness or enucleation, visual fields in the remaining eye are scored. Score 1 only if a clear-cut asymmetry, including quadrantanopia, is found. If patient is blind from any cause, score 3. Double simultaneous stimulation is performed at this point. If there is extinction, patient receives a 1, and the results are used to respond to item 11.</p>	<p>0 = No visual loss. 1 = Partial hemianopia. 2 = Complete hemianopia. 3 = Bilateral hemianopia (blind including cortical blindness).</p>	<p>_____</p>
<p>4. Facial Palsy: Ask – or use pantomime to encourage – the patient to show teeth or raise eyebrows and close eyes. Score symmetry of grimace in response to noxious stimuli in the poorly responsive or non-comprehending patient. If facial trauma/bandages, orotracheal tube, tape or other physical barriers obscure the face, these should be removed to the extent possible.</p>	<p>0 = Normal symmetrical movements. 1 = Minor paralysis (flattened nasolabial fold, asymmetry on smiling). 2 = Partial paralysis (total or near-total paralysis of lower face). 3 = Complete paralysis of one or both sides (absence of facial movement in the upper and lower face).</p>	<p>_____</p>
<p>5. Motor Arm: The limb is placed in the appropriate position: extend the arms (palms down) 90 degrees (if sitting) or 45 degrees (if supine). Drift is scored if the arm falls before 10 seconds. The aphasic patient is encouraged using urgency in the voice and pantomime, but not noxious stimulation. Each limb is tested in turn, beginning with the non-paretic arm. Only in the case of amputation or joint fusion at the shoulder, the examiner should record the score as untestable (UN), and clearly write the explanation for this choice.</p>	<p>0 = No drift; limb holds 90 (or 45) degrees for full 10 seconds. 1 = Drift; limb holds 90 (or 45) degrees, but drifts down before full 10 seconds; does not hit bed or other support. 2 = Some effort against gravity; limb cannot get to or maintain (if cued) 90 (or 45) degrees, drifts down to bed, but has some effort against gravity. 3 = No effort against gravity; limb falls. 4 = No movement. UN = Amputation or joint fusion, explain: _____</p> <p>5a. Left Arm</p> <p>5b. Right Arm</p>	<p>_____ _____</p>
<p>6. Motor Leg: The limb is placed in the appropriate position: hold the leg at 30 degrees (always tested supine). Drift is scored if the leg falls before 5 seconds. The aphasic patient is encouraged using urgency in the voice and pantomime, but not noxious stimulation. Each limb is tested in turn, beginning with the non-paretic leg. Only in the case of amputation or joint fusion at the hip, the examiner should record the score as untestable (UN), and clearly write the explanation for this choice.</p>	<p>0 = No drift; leg holds 30-degree position for full 5 seconds. 1 = Drift; leg falls by the end of the 5-second period but does not hit bed. 2 = Some effort against gravity; leg falls to bed by 5 seconds, but has some effort against gravity. 3 = No effort against gravity; leg falls to bed immediately. 4 = No movement. UN = Amputation or joint fusion, explain: _____</p> <p>6a. Left Leg</p> <p>6b. Right Leg</p>	<p>_____</p>

N I H STROKE SCALE

Patient Identification. _____-_____-_____

Pt. Date of Birth ____/____/____

Hospital _____(____-____)

Date of Exam ____/____/____

Interval: Baseline 2 hours post treatment 24 hours post onset of symptoms ±20 minutes 7-10 days
 3 months Other _____(____)

<p>7. Limb Ataxia: This item is aimed at finding evidence of a unilateral cerebellar lesion. Test with eyes open. In case of visual defect, ensure testing is done in intact visual field. The finger-nose-finger and heel-shin tests are performed on both sides, and ataxia is scored only if present out of proportion to weakness. Ataxia is absent in the patient who cannot understand or is paralyzed. Only in the case of amputation or joint fusion, the examiner should record the score as untestable (UN), and clearly write the explanation for this choice. In case of blindness, test by having the patient touch nose from extended arm position.</p>	<p>0 = Absent.</p> <p>1 = Present in one limb.</p> <p>2 = Present in two limbs.</p> <p>UN = Amputation or joint fusion, explain: _____</p>	<p>_____</p>
<p>8. Sensory: Sensation or grimace to pinprick when tested, or withdrawal from noxious stimulus in the obtunded or aphasic patient. Only sensory loss attributed to stroke is scored as abnormal and the examiner should test as many body areas (arms [not hands], legs, trunk, face) as needed to accurately check for hemisensory loss. A score of 2, "severe or total sensory loss," should only be given when a severe or total loss of sensation can be clearly demonstrated. Stuporous and aphasic patients will, therefore, probably score 1 or 0. The patient with brainstem stroke who has bilateral loss of sensation is scored 2. If the patient does not respond and is quadriplegic, score 2. Patients in a coma (item 1a=3) are automatically given a 2 on this item.</p>	<p>0 = Normal; no sensory loss.</p> <p>1 = Mild-to-moderate sensory loss; patient feels pinprick is less sharp or is dull on the affected side; or there is a loss of superficial pain with pinprick, but patient is aware of being touched.</p> <p>2 = Severe to total sensory loss; patient is not aware of being touched in the face, arm, and leg.</p>	<p>_____</p>
<p>9. Best Language: A great deal of information about comprehension will be obtained during the preceding sections of the examination. For this scale item, the patient is asked to describe what is happening in the attached picture, to name the items on the attached naming sheet and to read from the attached list of sentences. Comprehension is judged from responses here, as well as to all of the commands in the preceding general neurological exam. If visual loss interferes with the tests, ask the patient to identify objects placed in the hand, repeat, and produce speech. The intubated patient should be asked to write. The patient in a coma (item 1a=3) will automatically score 3 on this item. The examiner must choose a score for the patient with stupor or limited cooperation, but a score of 3 should be used only if the patient is mute and follows no one-step commands.</p>	<p>0 = No aphasia; normal.</p> <p>1 = Mild-to-moderate aphasia; some obvious loss of fluency or facility of comprehension, without significant limitation on ideas expressed or form of expression. Reduction of speech and/or comprehension, however, makes conversation about provided materials difficult or impossible. For example, in conversation about provided materials, examiner can identify picture or naming card content from patient's response.</p> <p>2 = Severe aphasia; all communication is through fragmentary expression; great need for inference, questioning, and guessing by the listener. Range of information that can be exchanged is limited; listener carries burden of communication. Examiner cannot identify materials provided from patient response.</p> <p>3 = Mute, global aphasia; no usable speech or auditory comprehension.</p>	<p>_____</p>
<p>10. Dysarthria: If patient is thought to be normal, an adequate sample of speech must be obtained by asking patient to read or repeat words from the attached list. If the patient has severe aphasia, the clarity of articulation of spontaneous speech can be rated. Only if the patient is intubated or has other physical barriers to producing speech, the examiner should record the score as untestable (UN), and clearly write an explanation for this choice. Do not tell the patient why he or she is being tested.</p>	<p>0 = Normal.</p> <p>1 = Mild-to-moderate dysarthria; patient slurs at least some words and, at worst, can be understood with some difficulty.</p> <p>2 = Severe dysarthria; patient's speech is so slurred as to be unintelligible in the absence of or out of proportion to any dysphasia, or is mute/anarthric.</p> <p>UN = Intubated or other physical barrier, explain: _____</p>	<p>_____</p>

N I H STROKE SCALE

Patient Identification. ____-____-____

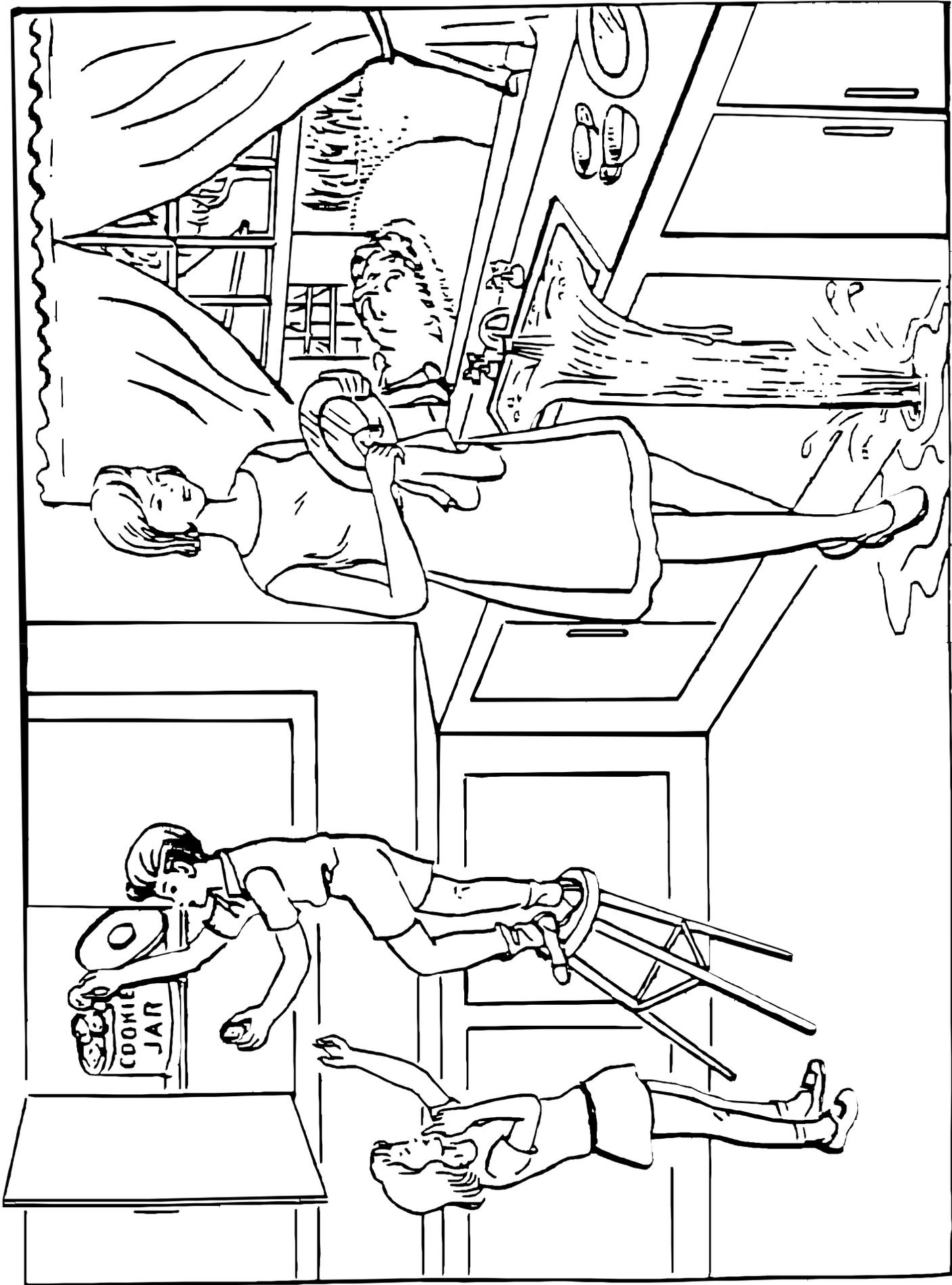
Pt. Date of Birth ____/____/____

Hospital _____(____-____)

Date of Exam ____/____/____

Interval: Baseline 2 hours post treatment 24 hours post onset of symptoms ±20 minutes 7-10 days
 3 months Other _____(____)

<p>11. Extinction and Inattention (formerly Neglect): Sufficient information to identify neglect may be obtained during the prior testing. If the patient has a severe visual loss preventing visual double simultaneous stimulation, and the cutaneous stimuli are normal, the score is normal. If the patient has aphasia but does appear to attend to both sides, the score is normal. The presence of visual spatial neglect or anosagnosia may also be taken as evidence of abnormality. Since the abnormality is scored only if present, the item is never untestable.</p>	<p>0 = No abnormality.</p> <p>1 = Visual, tactile, auditory, spatial, or personal inattention or extinction to bilateral simultaneous stimulation in one of the sensory modalities.</p> <p>2 = Profound hemi-inattention or extinction to more than one modality; does not recognize own hand or orients to only one side of space.</p>	<p>_____</p>
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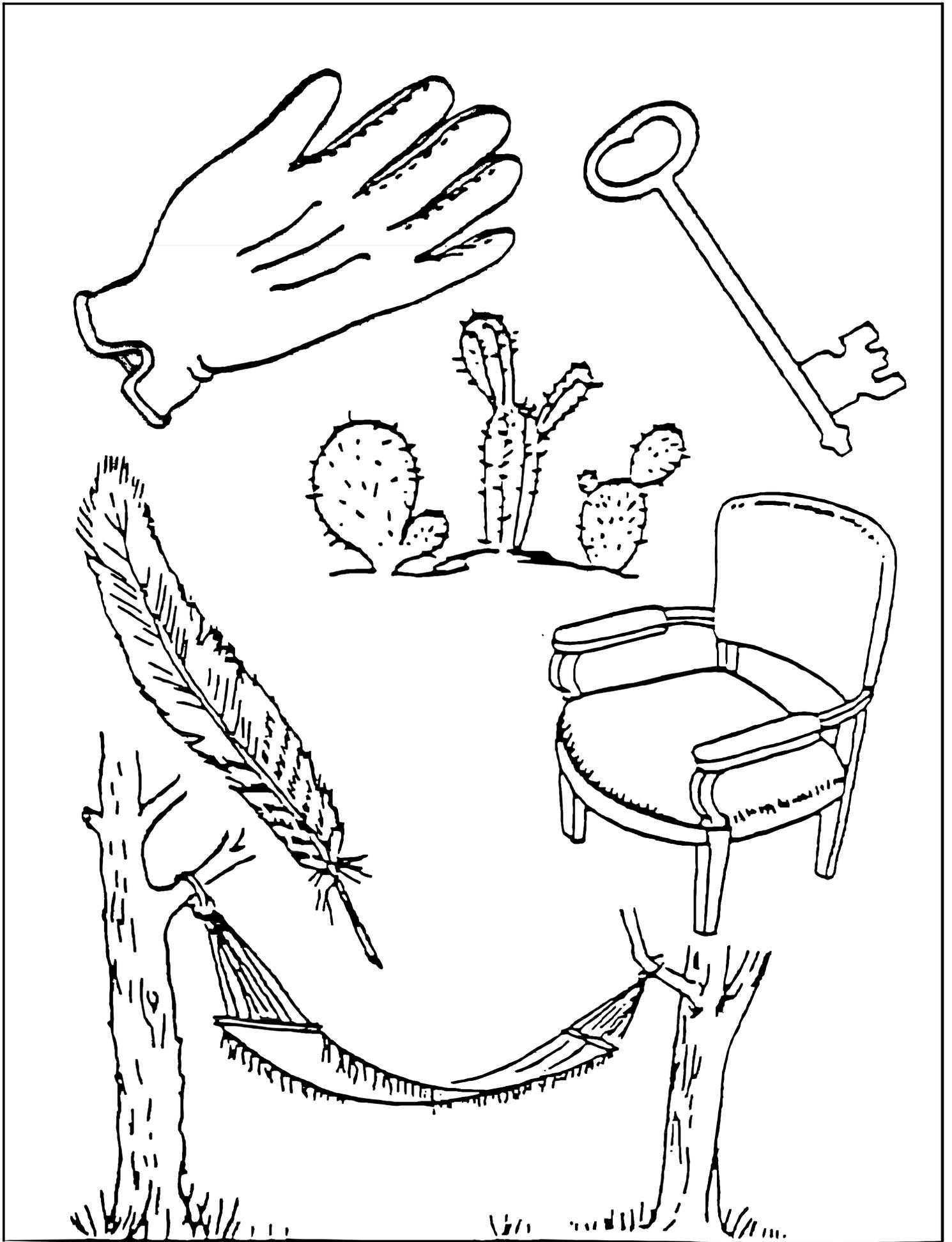
You know how.

Down to earth.

I got home from work.

**Near the table in the dining
room.**

**They heard him speak on the
radio last night.**



MAMA

TIP – TOP

FIFTY – FIFTY

THANKS

HUCKLEBERRY

BASEBALL PLAYER

North Central Texas Trauma Regional Advisory Council (NCTTRAC) 2016 Stroke Triage and Transport Guidelines

I. Introduction

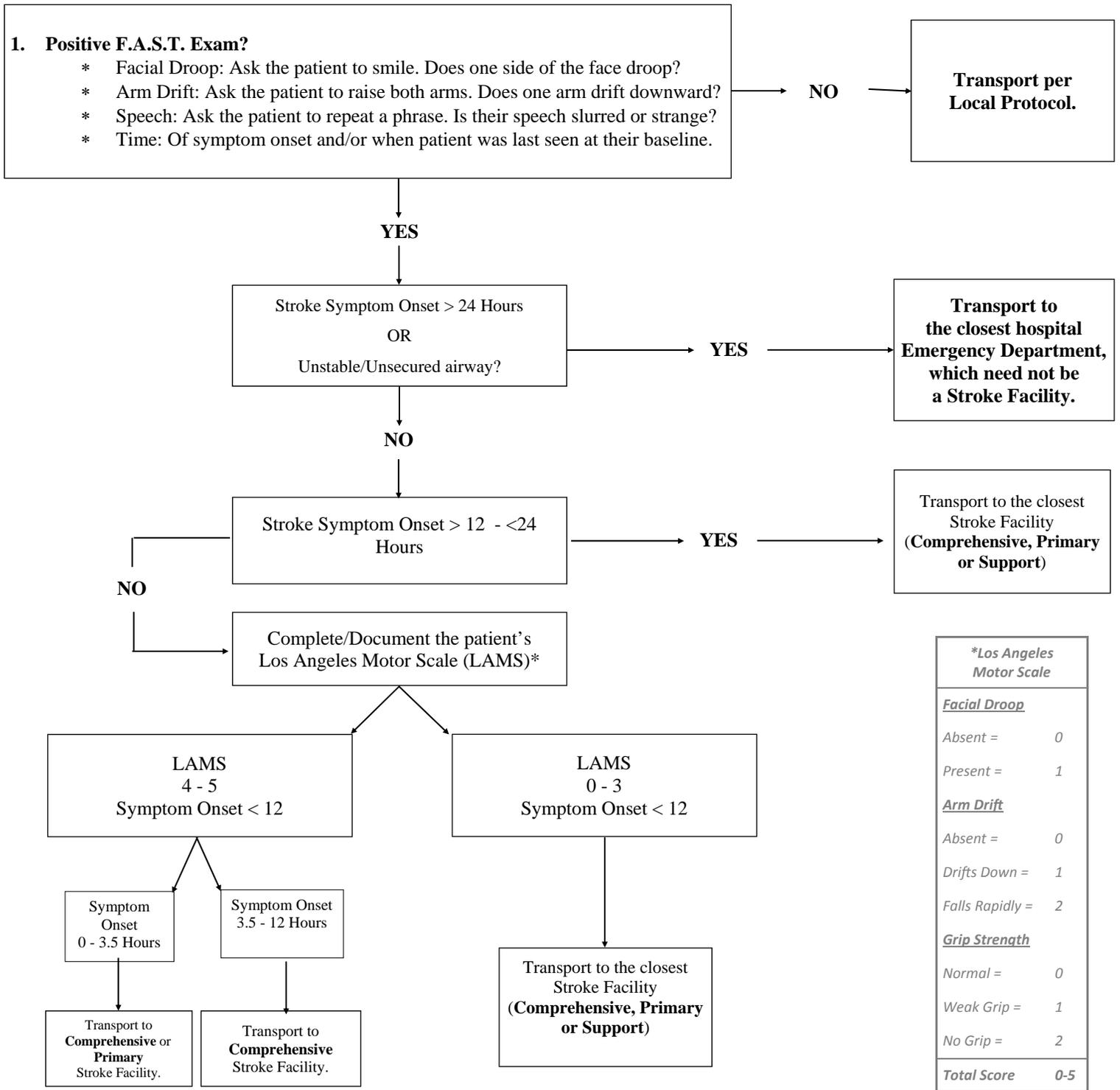
Texas Administrative Code, Title 25, Part 1, Chapter 157, Subchapter G, Rule §157.123 establishes the legal framework of the Emergency Medical Services (EMS) Trauma System in the State of Texas; which includes the creation of Regional Advisory Councils and their respective authority to develop an EMS/Stroke 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 Stroke Triage and Transport Guidelines for use by North Central Texas EMS providers licensed by the Texas Department of State Health Services (TDSHS).

II. Overview

- A. For the Stroke 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 Stroke patient is dependent upon rapid recognition of Stroke, management of life-threatening symptoms, 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 identify and/or correct immediate life threats. All secondary interventions should be performed en-route to an appropriate facility or while awaiting aeromedical evacuation.
- C. The first step in Stroke 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. aeromedical 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 critical 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 neurological deficit; 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.
 4. **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 (e.g. NC, NRB, C-PAP, BVM). Expose the chest and obtain breath sounds. Treat abnormalities according to local protocol.
 5. **Circulation:** Observe the color, temperature, and moisture of the skin while rapidly assessing for the presence/location/quality of pulses (e.g. carotid, femoral, radial) to estimate Blood Pressure and/or perfusion.
 6. **Disability:** Rapidly assess Level of Consciousness, pupils, and motor/sensory responses. If trauma 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). Perform a rapid FAST exam.
 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 symptoms found in the Primary Assessment. The objective of the Secondary Assessment is to gather detailed information.
 1. Reassess/Confirm Airway, Breathing, and Circulation. Make appropriate interventions as necessary.
 2. Obtain full/detailed vital signs utilizing available equipment.
 3. Determine blood glucose level. If outside normal limits, treat according to local protocol.
 4. Complete a Los Angeles Motor Scale stroke evaluation/assessment/scale and document in detail.
 5. Obtain SAMPLE and OPQRST histories if able/applicable.
 6. Obtain vascular access and administer appropriate fluid boluses to restore/maintain a radial pulse and/or SBP > 90 mmHg.
 7. Administer appropriate medications and other interventions per local protocol.
 8. Do not routinely treat hypertension in the Stroke patient unless specifically directed by Medical Control.
 9. Perform a detailed head-to-toe physical examination
- G. Continuously **Reassess** airway, breathing, circulation, and disability. Document vital signs frequently. Make appropriate interventions as necessary.

**North Central Texas Trauma Regional Advisory Council (NCTTRAC)
2016 Stroke Triage and Transport Guidelines**

III. Transport Algorithm



- ◇ Key priorities for Stroke patients are efficient scene times and rapid transport to an appropriate-level Stroke Center, unless immediate intervention (ABC's, Cardiac Arrest, etc.) is required.
- ◇ Cardiac Arrest patients should be transported to the closest appropriate hospital after receiving high-quality CPR on-scene per protocol.
- ◇ Pediatric patients should be triaged preferentially to a Pediatric Specialty Center.
- ◇ **Ultimately, the final transport decision rests with the individual EMS personnel directing patient care at the scene, in consultation with local protocol and/or local medical direction.**

* Or any of the other validated Stroke Scale Scores

North Central Texas Trauma Regional Advisory Council (NCTTRAC)
2016 Stroke Triage and Transport Guidelines

IV. Special Considerations

- A. Air Medical Evacuation:** When requesting air medical assets, confirm the aircraft's present location and estimated time of arrival (ETA) to the scene. The ETA includes start-up, lift-off, and flight time(s) to the scene.
1. If the aircraft's ETA or the total time to definitive care by air exceeds the estimated ground transport time to the closest most appropriate facility, immediate ground transport should be considered.
 2. Air medical 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).
 3. The purpose of air medical evacuation is to achieve getting the critical patient to the most appropriate definitive care hospital in the shortest amount of time. The air medical helicopter to be utilized is the closest medical helicopter to the scene appropriate for the patient's needs
- B. 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.
- C. Obstetrics:** Consult Off-Line or On-Line Medical Control/Direction.
- D. Pediatrics:** Pediatric patients should be triaged preferentially to a Pediatric Specialty Center.
1. If the term "lethargic" is used by the caregiver, the term needs to be described.
- E. 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).*
- F. Definition of Stroke Facility Designation:**
1. Comprehensive Stroke Facility (Level 1) – Provides comprehensive care to the seriously ill patients with complex strokes and cerebrovascular disease; have the capability to provide specialized care including advanced neuroimaging capabilities, various types of cerebral angiography, neurosurgical and endovascular techniques.
 2. Primary Stroke Facility (Level II) – Provides complete care for most acute stroke patients; have the capability to stabilize, diagnose and either provides treatment with acute therapies or arranges for transfer to a higher level of stroke care.
 3. Support Stroke Facility (Level III) – Provides resuscitation, stabilization and assessment of the stroke victim and either provides the treatment or arranges for immediate transfer to a higher level of stroke care either a Comprehensive (Level I) Stroke Center or Primary (Level II) Stroke Center.