

# Suspected Stroke

## History

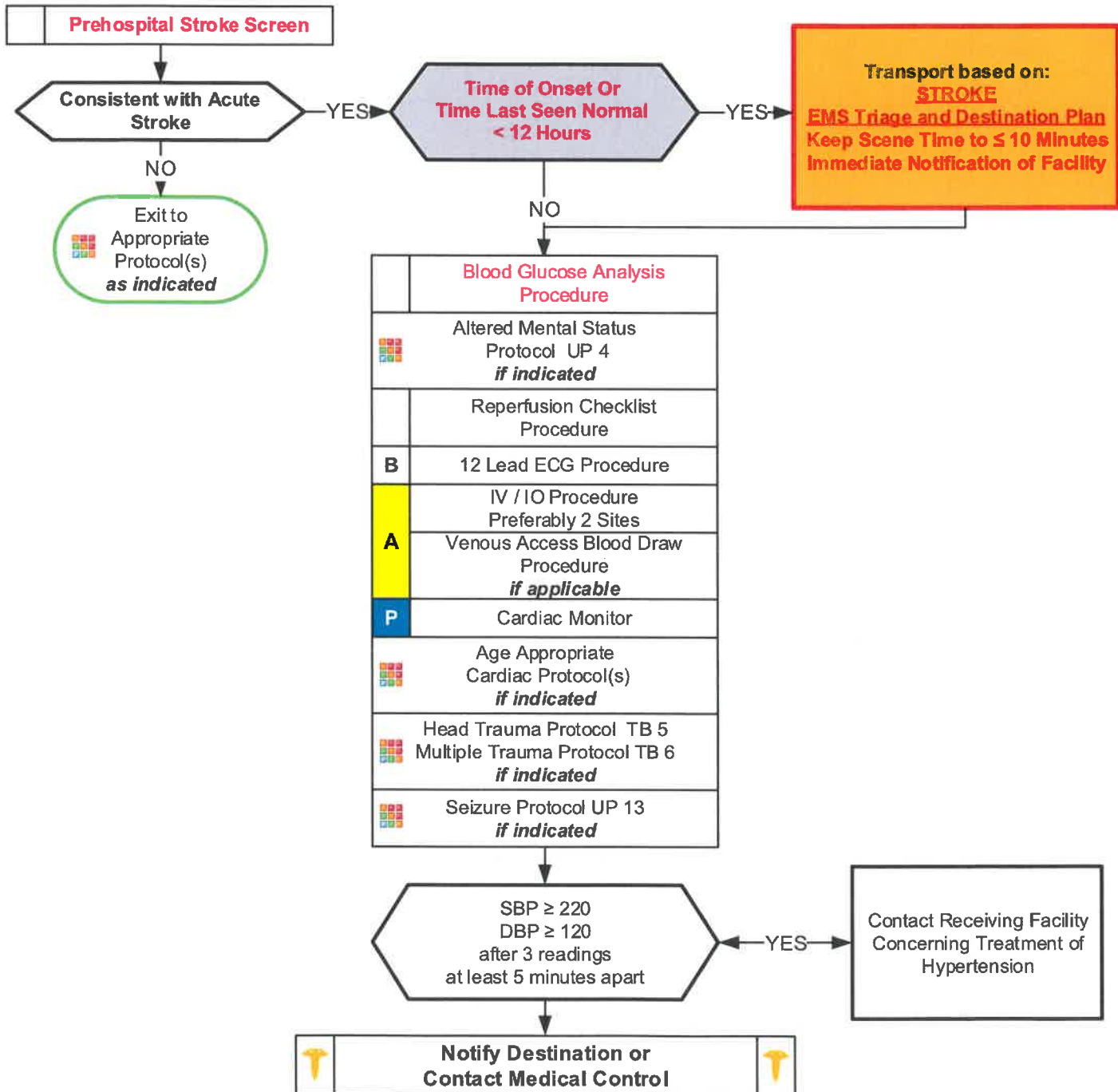
- Previous CVA, TIA's
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma
- Sickle Cell Disease
- Immune disorders
- Congenital heart defects
- Maternal infection / hypertension

## Signs and Symptoms

- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

## Differential

- See Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Todd's Paralysis
- Hypoglycemia
- Stroke
  - Thrombotic or Embolic (~85%)
  - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / Renal Failure



Universal Protocol Section



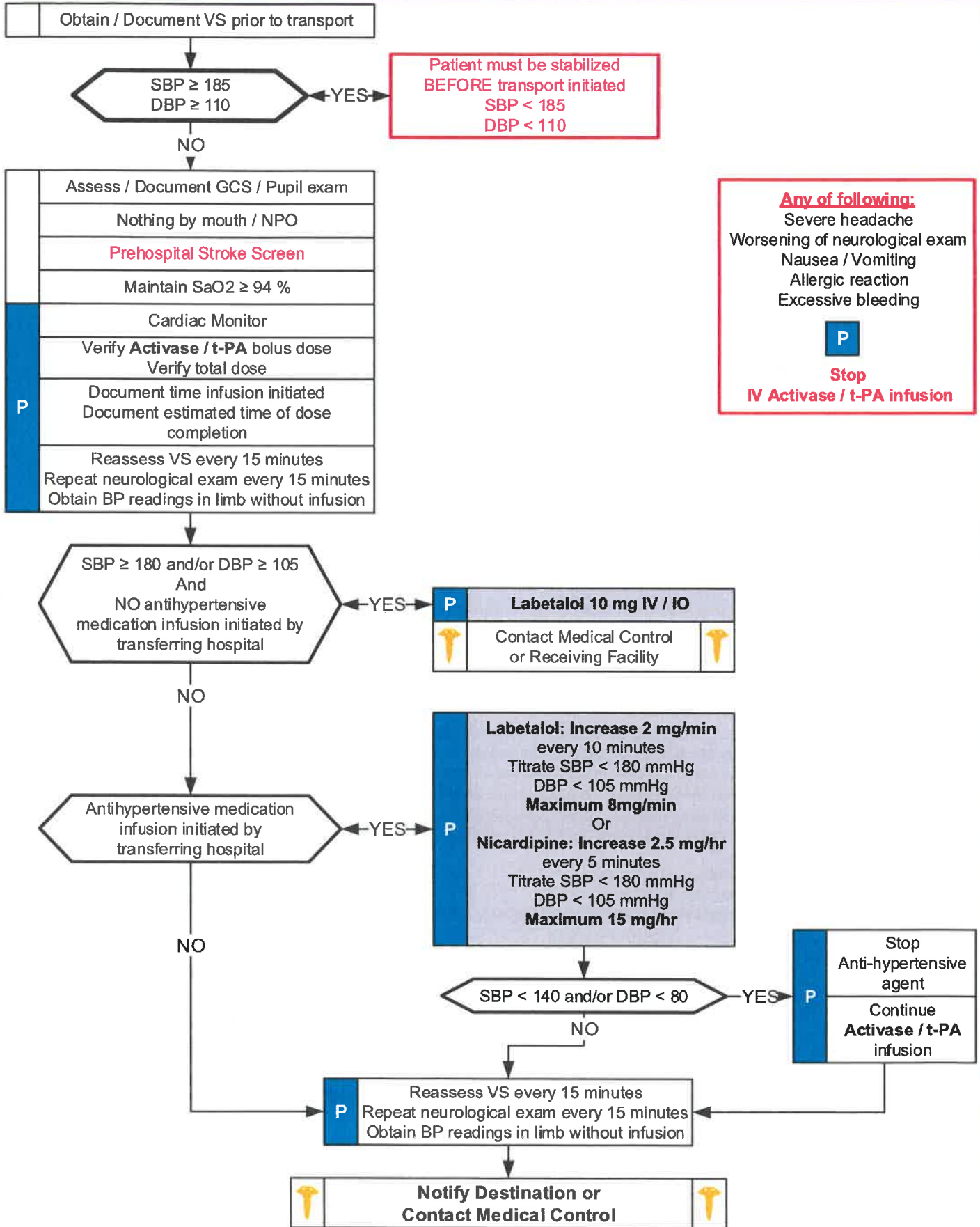
# Suspected Stroke

## Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Stroke Care Toolkit.**
- **Acute Stroke care is evolving rapidly. Time of onset / last seen normal may be changed at any time depending on the capabilities and resources of your hospital based on Stroke: EMS Triage and Destination Plan.**
- **Time of Onset or Last Seen Normal:**
  - **One of the most important items the pre-hospital provider can obtain, of which all treatment decisions are based.**
  - **Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:47 NOT "about 45 minutes ago.")**
  - **Without this information patient may not be able to receive thrombolytics at facility.**
  - **Wake up stroke: Time starts when patient last awake or symptom free.**
- **You are often in the best position to determine the actual Time of Onset while you have family, friends or caretakers available. Often these sources of information may arrive well after you have delivered the patient to the hospital. Delays in decisions due to lack of information may prevent an eligible patient from receiving thrombolytics.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient. With a duration of symptoms of less than  , scene times should be limited to  $\leq 10$  minutes, early notification / activation of receiving facility should be performed and transport times should be minimized.**
- **If possible place 2 IV sites.**
- **Blood Draw:**
  - **Many systems utilize EMS venous blood samples. Follow your local policy and procedures.**
- **The differential listed on the Altered Mental Status Protocol should also be considered.**
- **Be alert for airway problems (swallowing difficulty, vomiting/aspiration).**
- **Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.**
- **Document the Stroke Screen results in the PCR.**
- **Agencies may use validated pre-hospital stroke screen of choice.**
- **Pediatrics:**
  - **Strokes do occur in children, they are slightly more common in ages  $< 2$ , in boys, and in African-Americans. Newborn and infant symptoms consist of seizures, extreme sleepiness, and using only one side of the body. Children and teenagers symptoms may consist of severe headaches, vomiting, sleepiness, dizziness, and/or loss of balance or coordination.**



# Suspected Stroke: Activase / t-PA (Optional)



Adult Medical Protocol Section



# Suspected Stroke: Activase / t-PA (Optional)

## Pearls

- **This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.**
- **This protocol is intended for interfacility transfer patients only. Medication must be started at initial treating hospital.**
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in protocol compliance.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient.**
- **Onset of symptoms** is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time when the patient went to sleep or last time known to be symptom free.)
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- **Infusion Pump Alarm / No Flow:**
  - Remove drip chamber from Activase / t-PA bag.
  - Spike Activase / t-PA drip chamber to NS bag.
  - Restart infusion to complete medication remaining in IV tubing.
- **Medication dosing safety:**
  - When IV **Activase / t-PA** dose administration will continue en route, verify estimated time of completion.
  - Verify with sending hospital that excess **Activase / t-PA** has been withdrawn from the bottle and wasted.
  - This ensures the bottle will be empty when the full dose is finished. *For example, if the total dose is 70 mg, then 30 cc should be withdrawn and wasted since a 100 mg bottle of **Activase / t-PA** contains 100 mL of fluid when reconstituted.*
  - Sending hospital should apply a label to **Activase / t-PA** bottle with the number of mL of fluid that should be in the bottle in case of pump failure during transit.
- **Allergy / Anaphylaxis:**
  - Activase / t-PA**, is structurally identical to endogenous t-PA and therefore should not induce allergy, single cases of acute hypersensitivity reactions have been reported.
  - Angioedema:**
    - Rapid swelling (edema) of the dermis, subcutaneous tissue, mucosa and submucosal tissues. Typically involves the face, lips, tongue and neck.
    - Almost always self limiting but may progress to interfere with airway / breathing so close monitoring is warranted.
    - Utilize the Allergy / Anaphylaxis Protocol as indicated and also for angioedema. Infusion should be stopped.
    - Give all medications related to the Allergy / Anaphylaxis Protocol by IV route only as patient should remain NPO.

# Stroke

## EMS Triage and Destination Plan



### Stroke Patient

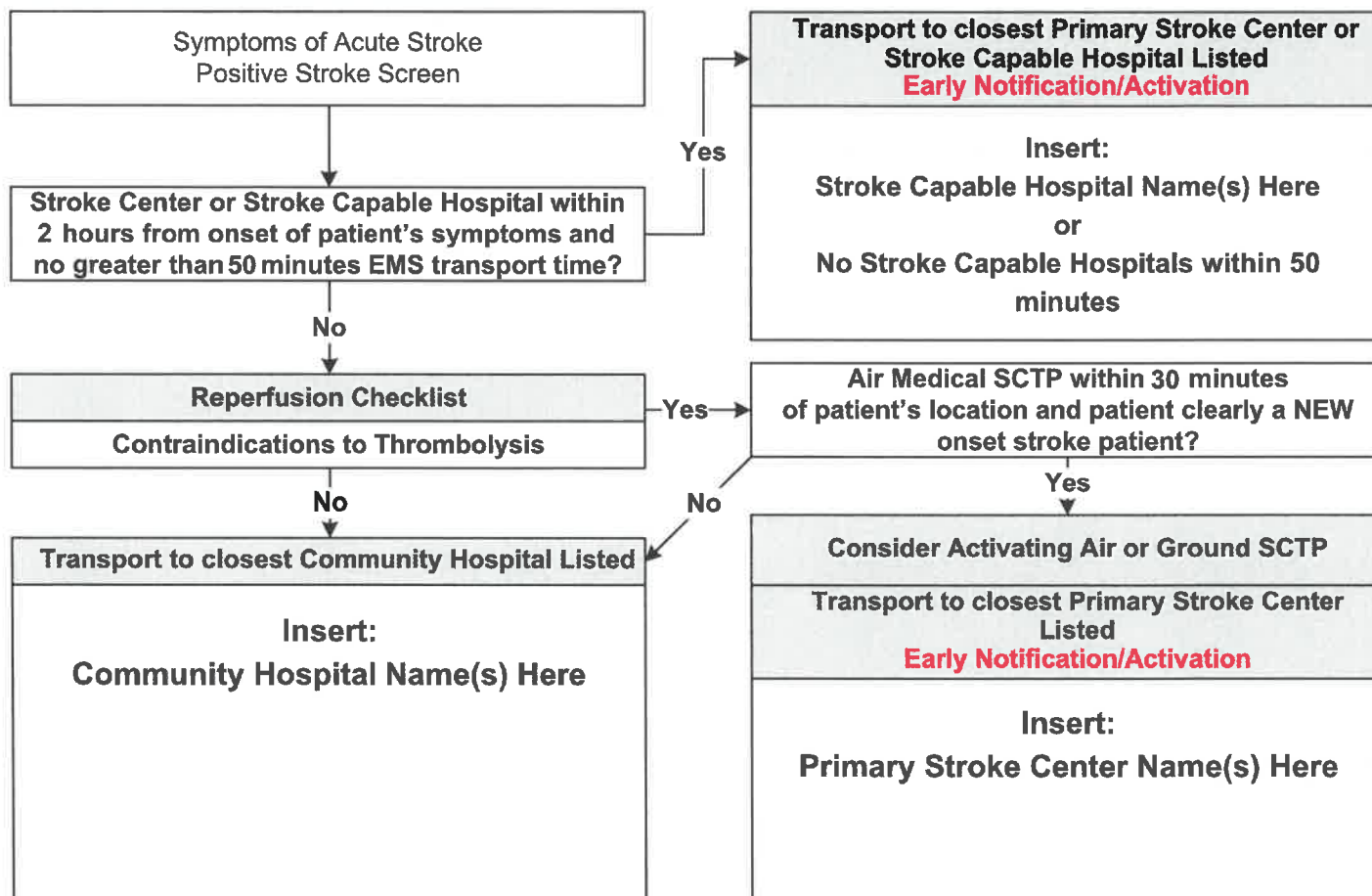
- \* A patient with symptoms of an acute Stroke as identified by the EMS Stroke Screen

### Time of Symptom Onset

- \* Defined as the last witnessed time the patient was symptom free (i.e. the time of onset for a patient awakening with stroke symptoms would be the last time he/she was known to be symptom free before the sleep period)

### The Purpose of this plan is to:

- \* Rapidly identify acute Stroke patients who call 911 or present to EMS
- \* Minimize the time from onset of Stroke symptoms to definitive care
- \* Quickly diagnose a Stroke using validated EMS Stroke Screen
- \* Complete a reperfusion checklist (unless being transported directly to a Stroke Capable Hospital) to determine thrombolytic eligibility
- \* Rapidly identify the best hospital destination based on symptom onset time, reperfusion checklist, and predicted transport time
- \* Early activation/notification to the hospital prior to patient arrival
- \* Minimize scene time to 10 minutes or less
- \* Provide quality EMS service and patient care to the EMS Systems citizens
- \* Continuously evaluate the EMS System based on North Carolina's Stroke EMS performance measures



Stroke EMS Triage and Destination Plan

### Pearls and Definitions

- \* All Stroke Patients must be triaged and transported using this plan. This plan is in effect 24/7/365
- \* All Patient Care is based on the EMS Suspected Stroke Protocol
- \* **Primary Stroke Center** = a hospital that is currently accredited by the Joint Commission as a Primary Stroke Center. Free standing emergency departments and satellite facilities are not considered part of the Primary Stroke Center.
- \* **Stroke Capable Hospital** = a hospital which provides emergency care with a commitment to Stroke and the following capabilities:
  - \* CT availability with in-house technician availability 24/7/365
  - \* Ability to rapidly evaluate an acute stroke patient to identify patients who would benefit from thrombolytic administration
  - \* Ability and willingness to administer thrombolytic agents to eligible acute Stroke patients
  - \* Accepts all patients regardless of bed availability
  - \* Provides outcome and performance measure feedback to EMS including case review
- \* **Community Hospital** = a local hospital within the EMS System's service area which provides emergency care but does not meet the criteria for a Primary Stroke Center or Stroke Capable Hospital
- \* **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute Stroke patient from EMS or a Hospital and transport the patient to a Primary Stroke Center.

**(Insert Name Here) EMS System**

This protocol has been developed by the North Carolina Office of EMS

