San Antonio Stroke Center Guidance for Rapid Treatment and Inter-Facility Transfer of Critical Stroke Patients

September 28, 2010

Executive Summary:

The San Antonio Stroke Centers, in collaboration with other hospitals, physicians, and EMS agencies, developed the Regional Stroke Systems Committee in mid-2008. The committee has developed Pre-hospital Stroke Alert criteria, rapid response teams in the stroke centers, central “one-call” transfer processes at each stroke center and educational material and offerings for the regional hospitals. The group meets monthly and conducts both a System Performance Improvement session and a committee meeting on the first Monday of the month. The Regional Stroke Systems Committee welcomes and encourages participation in the committee by any stakeholder in the STRAC region.

The Stroke System Performance Improvement sessions have revealed inconsistencies in the Inter-Facility Transfer process and the care both prior to transfer and during transport to the Stroke Centers. The committee has determined an effective method is to provide clear and concise guidance for emergency physicians and emergency nurses caring for stroke patients is a valuable tool in the care of the stroke patient.

Purpose of the Checklist:

To share common acute stroke competencies of care with transferring hospitals as they consider administration of Tissue Plasminogen Activator (t-PA) and Inter-Facility Transfer (drip and ship) into a San Antonio Stroke Center. The checklists attached outline the basic competencies that San Antonio Stroke Centers use in their day to day operations and work with Acute Stroke Patients. This guidance sheet can help organize care and can be used as a worksheet to make notes as you work through the process of deciding your treatment course.

The Regional Stroke Systems committee would like to thank the work of the Stroke Center nurse coordinators for the development of these regional checklists. Further, the committee welcomes and encourages feedback related to the checklists or any other issues that can improve the care of the stroke patient in the STRAC region.
Checklist 1

Guidance for the Treatment of Ischemic Strokes – non-t-PA patients

(Patient does not meet criteria for treating with t-PA)

___Last known time patient was seen normal? Time __________ (document here).

___CT scan of the heard non-contrasted, with quick turn-around read by radiology (check one below. _____Time to CT scanner _____Time complete/read.

___Ischemic Stroke         ___Intracerebral hemorrhage

___Perform the National Institutes of Health Stroke Scale (NIHSS). ______(document total score here)

___Perform a dysphagia screen, document whether or not patient passed or failed. We recommend keeping the patient NPO until a formal swallow screen has been done.

___Start 2 peripheral IV lines.

___Draw labs (STAT CBC with platelets, coags [PT/INR/aPTT], comprehensive chemistries, cardiac enzymes).

___Place patient on cardiac monitor, pulse oximeter, and obtain 12 lead ECG.

___Monitor vital signs every 15 minutes.

___Oxygen per nasal cannula for O2 sat below 90% at 2-3L/min.

___HOB up 30 degrees.

___Blood pressure control
Checklist 2

Guidance for the Treatment of Hemorrhagic Strokes

___Last known time patient was seen normal?  Time ____________(document here).

___CT scan of the heard non-contrasted, with quick turn-around read by radiology (check one below.  _____Time to CT scanner  ____Time complete/read.

   ___Ischemic Stroke  ___Intracerebral hemorrhage

___Perform the National Institutes of Health Stroke Scale (NIHSS).  ______(document here)

___Perform a dysphagia screen, document whether or not patient passed or failed.

___Draw labs (STAT CBC with platelets, coags [PT/INR/aPTT], comprehensive chemistries, cardiac enzymes, fibrinogen and d-dimer).

___Place patient on cardiac monitor, pulse oximeter, and obtain 12 lead ECG.

___Monitor vital signs every 15 minutes.  Keep BP below 160/90.

___Oxygen per nasal cannula for O2 sat below 90% at 2-3L/min.
Checklist 3

Guidance for the Management of Hypertension in Ischemic Stroke

**Indication that patient is eligible for treatment with intravenous t-PA or other acute reperfusion intervention**

**Blood pressure level**
- Systolic >185 mm Hg or diastolic >110 mm Hg
- Labetalol 10 to 20 mg IV over 1 to 2 minutes, may repeat X1;
  or
- Nitropaste 1 to 2 inches;
  or
- Nicardipine infusion, 5 mg/h, titrate up by 2.5 mg/h at 5- to 15-minute intervals, maximum dose 15 mg/h; when desired blood pressure attained, reduce to 3 mg/h

If blood pressure does not decline and remains <185/110 mm Hg, do not administer t-PA

**Management of blood pressure during and after treatment with t-PA or other acute reperfusion intervention**

*Monitor blood pressure every 15 minutes during treatment and then for another 2 hours, then every 30 minutes for 6 hours, and then every hour for 16 hours*

**Blood pressure level**
- Systolic 180 to 230 mm Hg or diastolic 105 to 120 mm Hg
- Labetalol 10 mg IV over 1 to 2 minutes, may repeat every 10 to 20 minutes, maximum dose of 300 mg;
  or
- Labetalol 10 mg IV followed by an infusion at 2 to 8 mg/min
  Systolic >230 mm Hg or diastolic 121 to 140 mm Hg
- Labetalol 10 mg IV over 1 to 2 minutes, may repeat every 10 to 20 minutes, maximum dose of 300 mg;
  or
- Labetalol 10 mg IV followed by an infusion at 2 to 8 mg/min;
  or
- Nicardipine infusion, 5 mg/h, titrate up to desired effect by increasing 2.5 mg/h every 5 minutes to maximum of 15 mg/
Checklist 4
San Antonio Stroke Centers: Guidance for Rapid Treatment

**t-PA Checklist for Acute Ischemic Stroke: For patients who present within 4.5 hours of symptom onset**

**Immediate triage**
_____ Last time patient was seen to be normal: __________
_____ Review eligibility and contraindications for administration of tPA
_____ Stat head CT without contrast
_____ Obtain baseline NIH Stroke Scale Score: ______
_____ Start two peripheral IV lines - 1 line dedicated for t-PA
_____ Draw labs (CBC, glucose, PT, PTT). Minimize arterial and venous punctures.
_____ Obtain actual weight in Kg __________ (you may get an estimate weight)
_____ Alert pharmacy of potential t-PA candidate if you don’t keep tPA in the ED (Give weight in kg for dosing purposes)
_____ Cardiac Monitor, pulse oximeter, obtain 12 lead EKG
_____ Monitor vital signs every 15 minutes. Alert physician if SBP >185 or DBP >110
_____ O2 per nasal cannula if O2 sat below 90% at 2-3 L/min
_____ HOB up 30 degrees

**Administration of t-PA**
_____ Contact San Antonio Stroke Center (see STROKE ALGORITHM) _____ The attending physician discusses risks and benefits of IV t-PA with the patient/SO

_____ t-PA (Alteplase, Activase) is the **ONLY** FDA approved treatment

    TNK (Retavase; Tenecteplase) is **not** FDA approved and should **NOT** be used for stroke

_____ **No** HEPARIN, WARFARIN, ASPIRIN, ANTIPLATELET DRUGS OR LMWH (Lovenox (Enoxaparin), Dalteparin, or Fondaparinux) or non warfarin anticoagulants given prior to t-PA infusion
_____ If ordered place nasogastric tube or foley catheter prior to t-PA administration

_____ Administer t-PA as follows:

1. Total dose = 0.9 mg/Kg t-PA (maximum dose not to exceed 90 mg.)
2. Waste tPA that will not be administered
3. Give 10% of the total dose as an initial IV bolus over 1 minute.
4. Give remaining dosage per IV infusion pump over 1 hour
5. When the t-PA bag is empty, add 20cc of NS to the bag and continue infusion at the same rate to flush tubing.

Post t-PA Administration

_____ Automatic blood pressure devices should not be used x2 hours after tPA infusion.

Obtain VS and neuro checks every 15 minutes x2 hours, then every 30 min x6 hours, then every hour x the next 16 hours (total time for tPA vital signs is 24 hours)

_____ If SBP is ≥ 180 or if DBP is ≥ 105 for 2 or more readings 5 minutes apart please institute the following BP control protocol:

1. **Labetalol Protocol** - Give Labetalol 10 mg IV over 1-2 minutes. The dose may be repeated or doubled every 10-20 minutes up to a total dose of 150 mg. Watch for bradycardia
2. **Cardene (Nicardipine) drip** begin at 5mg/hr -- titrate up by 1-2.5 mg/hr every 5 min to a maximum of 15 mg/hour to maintain SBP < 180 and/or DBP < 105
3. **Nipride drip** - only if absolutely necessary not recommended for the treatment of hypertension in acute ischemic stroke.

_____ No HEPARIN, WARFARIN, ASPIRIN, antiplatelets or LMWH (Lovenox (Enoxaparin, Dalteparin, Fondaparinux), for 24 hours after t-PA administered

_____ HOB up 30 degrees

_____ Monitor for development of angioedema

_____ Repeat CT scan 24 hours after tPA administration Precautions after t-PA

_____ Keep patient NPO for 24 hours after stroke

_____ Avoid arterial or venous punctures for 24 hours.
All arterial puncture sites must be compressed for a full 30 mins followed by a pressure dressing and subsequently monitored closely for bleeding. (at least every 30 minutes)

**Attachments to include:**

- Dosing table for tPA
- Inclusion/Exclusion criteria for tPA administration
- NIH-SS worksheet
- Guidelines for Management of Adults with Acute Ischemic Stroke. Adams 2007

**t-PA Eligibility and Contraindications – if acute symptom onset within the 3 hour window**

**t-PA Eligibility**

- Age 18 years or older
- Clinical diagnosis of ischemic stroke causing measurable neurological deficit
- Onset of stroke symptoms well established to be less than 4.5 hours before treatment would begin

**Strong Contraindications**

- Symptoms minor or rapidly improving
- Other stroke or serious head trauma within past 3 months
- Major surgery within last 14 days
- Known history of intracranial hemorrhage
- Sustained systolic blood pressure >185 mm Hg or diastolic blood pressure >110 mm Hg
- Aggressive treatment necessary to lower blood pressure
- Symptoms suggestive of subarachnoid hemorrhage
- Gastrointestinal or urinary hemorrhage within 21 days
_____ Arterial puncture at noncompressible site within 7 days
_____ Received heparin within 48 hours AND had elevated PTT
_____ Received Non warfarin anticoagulants within 48 hours
_____ Platelet count <100,000 mL

Relative Contraindications

_____ Seizure at onset of stroke
_____ Serum glucose <50 mg/dL or >400 mg/dL
_____ Hemorrhagic eye disorder
_____ Myocardial infarction in the previous 3 months
_____ Suspected septic embolism
_____ Known Infective endocarditis
_____ Patient on Coumadin (Warfarin) AND INR >1.7

If acute symptom onset within the extended 3 – 4.5 window - Additional exclusions include:

_____ Age >80
_____ NIHSS >25
_____ Patient on Coumadin (Warfarin) - regardless of INR
_____ Combination of prior stroke AND diabetes
_____ Otherwise all eligibility and contraindications are the same as the 3 hr window

_____ Head CT negative for blood
REFERENCES:

   http://stroke.ahajournals.org/cgi/reprint/STROKEAHA.107.181486

2. Guidelines for the Management of Spontaneous Intracerebral Hemorrhage in Adults 2007 Update
   http://stroke.ahajournals.org/cgi/reprint/STROKEAHA.107.183689

3. Comprehensive Overview of Nursing and Interdisciplinary Care of the Acute Ischemic Stroke Patient 2009
   http://stroke.ahajournals.org/cgi/reprint/STROKEAHA.109.192362

Manzella, S.M. & Galante, K. “Establishment of Stroke Treatment Plans: One Hospital’s Experience”.


Summary of clinical data on ACTIVASE (Alteplase, recombinant), a tissue plasminogen activator, in the treatment of acute ischemic stroke, Division of Data Management and Biostatistics, Department of Clinical Research, Genentech, Inc.


Diagnosis and initial treatment of ischemic stroke. Institute for Clinical Systems Improvement (ICSI).


STROKE ALGORITHM

1. RECOGNITION

Act FAST:
✓ Facial droop
✓ Arm Drift
✓ Speech
✓ Time

Stroke Warning Signs: Sudden onset of any of the following:
• Numbness/weakness on one side of the face or body
• Difficulty speaking or understanding speech
• Blurred vision
• Loss of balance/coordination
• Severe or unexplained headache

2. EVALUATION

Target Times:
• Door to MD < 15 min
• Door to CT scan < 25 min
• Door to CT read < 45 min
• Door to Lab results < 45 min
• Door to TPA < 60 min

3. MANAGEMENT

CT scan normal, NO evidence of hemorrhage

CT scan normal, no evidence of Hemorrhage
If yes to all the following patient may be a candidate for t-PA:
Yes  No
Age 18 or older and functionally independent before this acute stroke presentation?
Yes  No
Clinical diagnosis of ischemic stroke causing a measurable neurologic deficit on NIH stroke scale presumed to be caused by cerebral ischemia after CT scan excludes hemorrhage or recent infarct
Yes  No
Ability to initiate thrombolytic therapy within 270 minutes (4.5 hours) from the onset of stroke symptom

Contact a Certified Stroke Center for transfer:

Baptist Healthcare System (ACCESS Baptist Transfer Center):
Toll Free – 1-877 -7BHS-1st / Local – 210-297-BHS1

Methodist Healthcare System Patient Placement Center:
210-575-ADMT

University Health System Transfer Center:
210-358-2500

CT abnormal, evidence of hemorrhage

Contact Certified Stroke Center for Neurology/Neurosurgery Consult

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Education and Training for Stroke

(This document is in the process of being expanded by STRAC Regional Stroke Coordinator Committee 07.31.2012)

- Link for Clinical Practice Guidelines

- American Heart Association/American Stroke Association

- EMS4Stroke
  http://www.strokeawareness.com/ems4stroke/

- NIH Training
  Stroke Care Network – NIH Stroke Scale without cost
  American Stroke Association – Cost Associated