Thrombolytic (IV tPA) Screen Inclusion/Exclusion Reference

1. Inclusions (all must = YES)
   a) Patient last known to be without symptoms LESS THAN 3 HOURS AGO (document time of symptom onset)
   b) Age at least 18 years old
   c) H & P consistent with possible Acute Stroke (document NIH stroke scale score)

2. Exclusions (All Exclusion must = NO)
   a) Requires aggressive BP treatment to maintain Systolic BP less than 185 mm/Hg and Diastolic BP less than 110 mm Hg.
   b) Patient has a clinical presentation that suggests subarachnoid hemorrhage (sudden severe headache)
   c) Patient has a clinical presentation consistent with acute MI, aortic dissection or post-MI pericarditis
   d) Any history of an intracranial hemorrhage
   e) Any known intracranial aneurysm, neoplasm, or AV malformation
   f) Head CT – evidence of major early infarct signs (diffuse swelling of the affected hemisphere, parenchymal hypodensity, and/or effacement of >33% of the middle cerebral artery territory)
   g) Labs
      i. Platelets < 100,000/mm3
      ii. Heparin received within 48 hrs, resulting in abnormally elevated PTT > upper normal limit
      iii. Current use of anticoagulant (Coumadin) with INR > 1.7 or PT > 15 seconds
      iv. Serum glucose <50 mg/dL or >400 mg/dL
   i) Within the last 3 months, the patient has had:
      i. Intracranial Surgery or Intraspinal Surgery
      ii. Previous Stroke
   ii. Major Head Trauma
   j) Within the last 7 days the patient has had a:
      i. Lumbar Puncture
      ii. Arterial puncture at non-compressible site
   k) Recent Dabigatran (Pradaxa) use, defined as:
      i. within 48 hours if estimated Crearance ≥ 50 mL/min
      ii. within 72 hours if estimated CrCl 30-49 mL/min
      iii. within 96 hours if estimated CrCl < 30 mL/min
   l) Recent Rivaroxaban (Xarelto) use, defined as:
      i. within 48 hours if estimated CrCl ≥ 50 mL/min
      ii. within 72 hours if estimated CrCl < 50 mL/min
   m) Recent Apixiban (Eliquis) use, defined as:
      i. within 48 hours if estimated CrCl ≥ 50 mL/min
      ii. within 72 hours if estimated CrCl < 50 mL/min
   n) Recent Edoxaban (Savaysa) use, defined as:
      i. within 48 hours if estimated CrCl ≥ 50 mL/min
      ii. within 72 hours if estimated CrCl < 50 mL/min

   ❖ Clinical decision point: Caution regarding novel oral anticoagulants (dabigatran, rivaroxaban, apixaban)
   *Normal aPTT, PT, and INR DO NOT REFLECT the absence of anticoagulant effect*

   **Expanded 4.5 hour Window -Thrombolytic Screen Inclusion/Exclusion**

   Inclusions (all must = yes): Patient last known to be without symptoms LESS THAN 4.5 HOURS AGO (document time of symptom onset) and above Inclusions (#1) b & c.

   Relative Exclusions: all of the above exclusions (#2) a - m AND n – q below MUST EQUAL NO:
   n) Patient is older than 80 years old
   o) Patient takes oral anticoagulants regardless of INR
   p) Patient has a baseline National Institutes of Health Stroke Scale > 25
   q) Patient has both a history of stroke and diabetes

11/11; 8/12; 8/13; 10/15

NOT PART OF THE MEDICAL RECORD
CVA – Ischemic Stroke  tPA (alteplase) Orders

Prior to initiating tPA:
- Stat non-contrast head CT
- Blood Glucose
- 2 Patent IVs (18gauge)

If indicated:
- Chest X-ray  Indication:  CVA
- EKG
- Labs:  CBC  BMP  PT/INR  Other:
  - Place Foley Catheter (place prior to initiating tPA if catheter needed)

**tPA (alteplase) Administration:**  Pt. Actual Weight ____________Kg

**tPA (alteplase) 0.9 mg/kg (maximum of 90 mg)**  Total Dose ____________ mg
- Bolus 10% of total dose given via IV infusion over 1 minute ____________ mg
- Infuse remaining 90% IV over the next 60 minutes ____________ mg
- No anticoagulants, antiplatelets, or non-steroidal anti-inflammatory medications for 24hrs

**IV Fluids after tPA infused:**
- Place prior to initiating tPA if catheter needed

**Vital Signs and Neuro Checks:** (Document on the tPA Administration /Monitoring Flowsheet)
- Every 15 minutes during and after tPA infusion for 2hrs, then
- Every 30 minutes for 6 hours, then
- Every 1 hr until 24hrs after IV tPA treatment started, then
- As indicated by patient status or per nursing unit routine

**Monitoring: (No automated BP cuffs once tPA initiated)**
- Telemetry
- SpO2
- Initiate Nursing post tPA Guidelines for Care
- Bed rest for 24 hours
- NPO for 12 hrs, then complete RN/LPN Swallow Screen. If failed notify MD, consult SLP & keep NPO

**For Signs/Symptoms of Bleeding:**
- STOP tPA (alteplase) Infusion
- Notify ordering Physician – STAT
- Send STAT labs:  PT/INR, PTT, Platelet count, fibrinogen, CBC, Type and Cross Match 2 units RBC’s
- Diagnostic study:
- If suspected intracranial bleed:
  - STAT non-contrast Head CT, indication: “Emergency, possible bleed due to thrombolytic therapy”

**Hypertension:** Systolic BP >180mm Hg or Diastolic BP > 105 mm Hg  during and after infusion
- Labetalol (Trandate®) Bolus 20 mg slow IVP (over 2 min).
  - **Initial:** May repeat Q 5 min x 4 (80mg) for SBP > 180 mmHg
  - **Maintenance therapy:** if BP controlled without further intervention
    - Labetalol _____mg IV Q 6 hr.  Hold for SBP < 100 mmHg  or  Pulse < 55 bpm.

Add Labetalol infusion if response to bolus dose is adequate but brief or if BP not controlled
- Labetalol infusion 200 mg in 200 mL normal saline
  - Start IV infusion:  2 mg / min
  - Titrate to goal by 1 mg/min Q 15 min
  - Max infusion rate of  8 mg/min
  - Max dose including boluses: 300 mg/24 hrs (e.g., discontinue after 2.5 hrs of 2 mg/min)
- NiCARDipine (Cardene®) infusion: 25 mg/250 mL 0.9% NaCl
  - Start at 5 mg/hr
  - Titrate 2.5 mg/hr Q 15 min to achieve target; Max dose 15 mg/hr

**MD Signature:**
- Date:
- Time:

**RN Signature:**
- Date:
- Time:
Stroke (CVA) – tPA Administration/Monitoring Flowsheet

<table>
<thead>
<tr>
<th>Patient Actual Weight in KG’s:</th>
<th>Total tPA dose (0.9mg/kg):</th>
<th>tPA bolus (10% of total dose):</th>
<th>Remaining 90% of tPA dose:</th>
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<th>(begin 15minute VS)</th>
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<th>Administering Nurse Initials:</th>
<th>(remaining 90% over 60 minutes)</th>
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<th>tPA infusion completed</th>
<th>Total infusion dose:</th>
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Monitor neurological status and vital signs:
- Every 15 minutes during tPA infusion and one hour after (total of 2 hours)
- Then every 30 minutes X 6 hours
- Then every 1 hours X 16 hours, and then
- As indicated by patient status or per nursing unit routine

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<th>Date:</th>
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<td>Resps:</td>
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<td>O2 Sat:</td>
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<td>Neuro Checks done and unchanged (RN Initials)</td>
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**LOC**

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**Motor**

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Speech

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<tr>
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<th>Orientation</th>
<th>Pupils</th>
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<tr>
<td>A= alert</td>
<td>X 3</td>
<td>1 mm</td>
<td>B=Brisk</td>
<td>AF=abnormal flexion</td>
</tr>
<tr>
<td>V=verbal only</td>
<td>X 2</td>
<td>2 mm</td>
<td>F=Fixed</td>
<td>AE=abnormal extension</td>
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<tr>
<td>T=tactile only</td>
<td>X 1</td>
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<td>S=Sluggish</td>
<td>0=no response</td>
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<tr>
<td>P=pain only</td>
<td>N=none</td>
<td>4 mm</td>
<td>1=flick</td>
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<td>P=none response</td>
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<td>2=wo/gravity</td>
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<td>N=No response</td>
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<td>3=wo/gravity</td>
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<td>Speech</td>
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<td>7 mm</td>
<td>4=overcome by resistance</td>
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<td>8 mm</td>
<td>5=normal</td>
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Nursing Signature/Initials

4/12; Revised: 7/12, 7/13; 8/13
**tPA Administration Monitoring Flowsheet**

**Page 2**

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<td>C=command</td>
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<td>X 2</td>
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**Nursing Signature/Initials**

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4/12; Revised: 7/12, 7/13; 8/13
Nursing Guidelines of Care for the tPA Ischemic Stroke Patient

Inclusion Criteria: All patients with the dx of stroke w/ physician order for tPA therapy- initial bolus and the following 24 hours

Stroke Team
- Confirm Notification of the Rapid Response/Stroke Team
- Review IV tPA Inclusion/Exclusion Reference
- NIHSS on admission, follow-up 2 hrs post tPA administration, and 24hrs post tPA
- Door to Needle of less than 60 minutes is recommended by AHA/ASA

Supportive Care and Treatment of Acute Stroke

Assessments
- Continue Frequent Vitals and Neuro Checks per tPA Order set/ tPA administration flow sheet
- Avoid placement of central venous access, arterial punctures, foley catheter, or NG tube for first 24 hours
- Notify physician:
  - STAT for signs and symptoms of bleeding complications

Management of bleeding:
- Stop tPA (Alteplase) Infusion
- Notify Neurologist (or ordering MD) – STAT
- STAT non-contrast Head CT- “Emergency, possible bleed due to thrombolytic therapy”
- Send STAT labs: PT/INR/PTT, Platelet count, Fibrinogen, CBC, Type and Cross Match 2 units RBC’s

  - For any signs and symptoms of neurological deterioration, including:
    - Change in level of consciousness- lethargy, sedation, increased confusion, agitation
    - Neurological deficits, new or increased
    - Nausea and vomiting, new onset
    - Headache, new onset or worsening
    - Evidence of angioedema (swelling of the tongue, lips or oropharynx)

  - Vital Signs including:
    - SBP ≥180 or < 110; DBP ≥105 or < 70
    - Heart rate > 100 or < 50
    - Temperature ≥ 100.5°F
    - O2 sats < 90% on room air or RR > 24

  - Goal for blood glucose is <180mg/dL

VTE Prevention: High risk for DVT formation; anticoagulation CONTRAINDICATED d/t high risk of bleeding within 24 hrs of treatment w/ IV tPA
- Complete Daily VTE Assessment
- SCDs unless contraindicated

Activity/Safety
- Nursing Swallow Screen prior to first po intake, including medications.
  - If Failed: Keep NPO, notify MD and SLP for swallowing evaluation. If Passed: Implement diet order.
- Bed rest for 24hrs, HOB 30° or greater, & turn and position at least every 2 hours while in bed if unable to move self

Nursing Screens (nursing-initiated consults that do not require a physician order)
- Case management/Discharge Planner
- Physical Therapy
- Occupational Therapy
- Speech/SLP if Nurse Swallow Screen failed, Speech Impaired or has Cognitive Deficits
- Dietician if new diagnosis of DM, Hgb A1C > 9, or BMI > 30

Patient/Caregiver Stroke Education
- Provide and Review Stroke Education Packet and Document Teaching under ‘patient education’ tab
- Stroke Education Packet should include all of the below:
  - Personalized Risk Factor Modification (Smoking Cessation, DM, HTN, Cholesterol, Sleep Apnea, Obesity)
  - Warning Signs and Symptoms of stroke (FAST)
  - How to call EMS
  - Medication Instructions/Compliance
  - Follow-up Appointment with Physician

Implemented By ______________________, RN       Date/Time __________________________
Inclusion Criteria: All patients with the dx of stroke w/ a physician order for tPA therapy- initial bolus and the following 24 hrs

Nursing Information Only

- NIHSS (National Institute of Health Stroke Scale) is a noninvasive and valid assessment tool used to evaluate neurological status- reliable predictor of infarct size, location, and stroke severity/disability
  - 0= No Stroke/No Deficits
  - 1-4= Minor Stroke/Mild Deficits
  - 5-15= Moderate Stroke/Moderate Deficits
  - 15-20= Moderate/Severe Stroke/Major Deficits
  - 21-42= Severe/Devastating Stroke/Major Deficits
- It is reasonable to administer BP medications to keep SBP < 180mmHg and DBP < 105mmHg during and following tPA administration.
- Controlled and individualized BP management may be best achieved with IV antihypertensive medications.
- Rapid lowering of BP in ischemic stroke patients may cause hypo-perfusion and result in poor patient outcomes.
- Hyperthermia in stroke patients may damage penumbra and increase brain damage.
- Sources for elevated temperature should be identified & treated. Administer antipyretic (ex. Tylenol) as ordered to prevent hyperthermia.
- It is recommended that O2 @ 2-4L/NC should be administered to maintain O2 sats > 94% but a physician order for O2 therapy is required. O2 is NOT recommended for non-hypoxic patients with acute ischemic stroke.
- Persistent hyperglycemia (>200 mg/dL) in the first 24 hours of acute stroke has been shown to result in worse patient outcomes than those with normoglycemia. Goal for blood glucose is < 180mg/dL.
- If glycemic order set is implemented, monitor closely to prevent hypoglycemia (< 60mg/dL).
- HOB elevation is recommended for patients at risk for ICP, aspiration pneumonia and angioedema.
- Majority of stroke patients will have some sort of swallowing difficulty and may be prone to aspiration pneumonia.
- Cognitive deficits may include being impulsive, unaware of safety risks, poor or short term memory problems etc.
- Monitor for fall risk. Stroke patients may be prone to being impulsive or unaware of deficits, increasing likelihood for falls
- Follow up CT/MRI of head is recommended at 24 hrs after tPA before starting anticoagulants or antiplatelet therapy.

Additional Stroke Resources:
Stroke Resource Center on Nurses Portal
RSFH Ischemic Stroke Algorithm with Roper/MUSC Transfer Agreement in Medical Records
AHA/ASA Guideline: Guidelines for the Early Management of Patients with Acute Ischemic Stroke
http://stroke.ahajournals.org/content/early/2013/01/31/STR.0b013e318284056a.abstract
American Association of Neuroscience Nurses (AANN) Clinical Practice Guidelines @ www.aann.org:
  Guide to the Care of the Hospitalized Patient with Ischemic Stroke
American Heart/American Stroke Association @ www.heart.org
Free NIHSS Certification @ www.ems4stroke.com

Implemented By ____________________________, RN       Date/Time ____________________________

Reference

Origin: 10/13
Roper St. Francis Healthcare
Ischemic Stroke Algorithm

**Patient presents with CVA Symptoms via WR**

**ED RN Assesses Patient for symptom onset**

- ** obten ASPECT Score from Neuro-Rad and call MUSC for Consultation 792-FAST**
- **Obtain ASPECT Score from Neuro-Rad and call MUSC for Consultation 792-FAST**

**Symptom onset communicated during EMS encode**

**Patient presents with CVA Symptoms to EMS**

- **ED RN Assesses Patient for symptom onset**
- **Perform CTA Head**
- **Give tPa**
- **Obtain ASPECT Score from Neuro-Rad and call MUSC for Consultation 792-FAST**

**In CT room:**
- **• NIHSS**
- **• BGL**
- **• INT and labs**

**Perform CTA Head**

- **• Zip-it “Hot Stroke” to notify Neuro-radiologist and Lifelink**
- **• Perform a STAT Head CT w/o Contrast CVA (choose appropriate indications)**

**Symptom onset ≤8 hrs or unknown?**

- **Yes**
  - **Take pt. to a ED room for triage & MD evaluation**
  - **Zip-it “Cold Stroke” to notify RRT, CT and lab after MD evaluation**
- **No**

**In ED Room:**
- **• NIHSS**
- **• BGL**
- **• INT and labs**
- **• Head CT after MD eval (*8+HR CVA)**

**MD/RRT evaluates if tPA candidate?**

- **Yes**
  - **Give tPa**
  - **Admit to RSFH w/ Neuro Consult if workup consistent with stroke**
  - **Symptoms improved?**
    - **Yes**
    - **Admit to RSFH w/ Neuro Consult**
    - **No**
  - **Obtain ASPECT Score from Neuro-Rad and call MUSC for Consultation 792-FAST**
- **No**
  - **Large vessel occlusion?**
    - **Yes**
    - **Admit to RSFH w/ Neuro Consult**
    - **No**

**Admit to RSFH w/ Neuro Consult if workup consistent with stroke**