Subject: Administration of Tissue Plasminogen Activator: tPA

Purpose: Provide guidelines for clot dissolving medication use.

Policy: tPA, Tissue Plasminogen Activator will be given in the ICU or ER under a monitored setting. Prescribing physician should be present when initiated.

- tPA can be administered intravenously for thrombolytic therapy of acute ischemic stroke within 3 hours of onset of symptoms after consideration of indications and contraindications.

- tPA can be administered intravenously for peripheral arterial thrombosis with similar considerations.

- tPA is administered intravenously for thrombolytic therapy of evolving acute ST segment elevation myocardial infarction (STEMI) or chest pain with presumably new LBBB. Consultation for the STEMI patient with cardiology will determine appropriateness of lytic therapy opposed to catheterization and revascularization.

Additional Information:

1. Explanation of procedures and gaining consent is the responsibility of the treating physician.

2. Neurologic patients considered for lytic therapy:
   a. Age over 18
   b. Clinical diagnosis of ischemic stroke with measurable neurologic deficit
   c. Onset of symptoms less than 180 minutes
   d. No evidence intracranial hemorrhage on pretreatment noncontrast head CT
   e. No witnessed seizure at stroke onset
   f. Contracted hypertension

3. Cardiac patients should be considered for tPA therapy at the discretion of the Cardiologist with these criteria:
   a. Inappropriateness of heart catheterization, PCI, stenting.
   b. Acute onset of chest pain, consistent (clinically) with coronary ischemia, unresponsive to standard sublingual nitroglycerin therapy.
   c. ST segment elevation of at least 0.1 mV (measured 0.02 seconds after the J joint) in at least one of the following locations:
      1) at least two or three inferior leads (II, III, a VF): or
      2) at least two of the six pericardial leads (V1-V6): or
      3) leads I and a VL: or
      4) Reciprocal ST segment depression of the pericardial leads V1-V4 consistent with posterior of injury: or
      5) the present of LBBB, primary ST changes in the inferior or anterior leads.
   d. The onset of chest pain must have occurred within 12 hours of the time of treatment. The chest pain is the pain that caused the patient to go to the hospital (not to include premonitory symptoms).
4. Contraindications to tPA:
   a. Absolute Contraindications:
      --any prior intracranial hemorrhage
      --known structural cerebral vascular lesion, aneurysm
      --known malignant intracranial neoplasm
      --ischemic stroke within 3 months except acute ischemic stroke within 3 hours
      --suspected aortic dissection
      --active bleeding or bleeding diathesis (excluding menses). Platelet count <100,000/mm³
      --significant closed head injury or facial trauma within 3 months
      --known internal bleeding on acute trauma (fracture)
   b. Relative Contraindications:
      --history of chronic, severe, poorly controlled hypertension
      --severe hypertension uncontrolled on presentation (SBp >180mmHg or DBp >110mmHg)
      --history of prior ischemic stroke >3 months, dementia, or known intracranial pathology not covered in contraindications
      --traumatic or prolonged CPR (>10 minutes) or major surgery <3 weeks
      --recent internal bleeding within 2-4 weeks
      --noncompressible vascular punctures within past 7 days
      --pregnancy
      --active peptic ulcer
      --current use of anticoagulants: high INR with high risk bleeding

5. In case of a hemorrhagic event, FFD is the antidote. Half like of the drug is 4-7 minutes.

6. Defibrillator and antiarrhythmic IV drugs should always been available particularly during transfer.

7. Administration of tPA as an infusion for peripheral arterial thrombolysis is at discretion of treating physician and tPA protocol is followed for 48 hours.

8. Follow tPA protocol for 48°:
   a. Vs Q 10-15 min x 4; then Q 1 hour x 6; then Q 2 hours x 12
   b. Inspect all sites for bleeding at frequent intervals
   c. Hold venous puncture sites 15 minutes
   d. Hold arterial punctures 30 minutes then apply pressure dressing
   e. No IM injections
   f. Report rash, dyspnea or decreasing mental status immediately.

Procedure:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Key Points</th>
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<tbody>
<tr>
<td>A. Establish IV access, 1-2 sites and heploc.</td>
<td>A. IV access for lab draws as well as fluids and medications.</td>
</tr>
<tr>
<td>B. Calculate dose: patient/weight (kg) x 0.9 mg/kg</td>
<td>B. Maximum dose is 90 mg. Physician should calculate and order dose. Two RNs check tPA dose before administration.</td>
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</table>
C. Wash hands, open package: look for defects, assemble supplies
   1. Withdraw 10cc sterile water from vial
   2. Inject entire volume into tPA powder in kit
   3. Withdraw 10% of calculated dose from vial in preparation for bolus
   4. Push bolus over 3 seconds
   5. Remainder of tPA dose infuses over next 1 hour. Prepare for heparin infusion according to doctor orders.

C. Syringes, IV tubing, IV pump required.
   2. Foaming is common. Let rest 2-3 minutes until bubbles dissipate.
   3. Discard unused amount tPA solution.
   4. Flush line before and after tPA if dextrose solution.

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<td>A. Establish IV access, 2 sites for IV, one site heploc.</td>
<td>A. Goal for door to needle time is 30 minutes.</td>
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<tr>
<td>B. Follow steps for calculating dosage per weight, assembling supplies and mixing tPA</td>
<td>B. Follow part I steps C-1, C-2 from tPA for acute ischemic stroke for reconstitution..</td>
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<tr>
<td>C. Draw up calculated tPA Dose.</td>
<td>C. Weight based dose found in package insert or order set TNK (8/06).</td>
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<tr>
<td>D. Push dose IV over 5 seconds.</td>
<td>D. IV line to be saline for tPA bolus.</td>
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<tr>
<td>E. Prepare heparin infusion as ordered; start as prescribed.</td>
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<td>F. Have IV anti-arrhythmics ready for ACLS protocol</td>
<td>F. Patients can have Vtach or Vfib as coronary artery acclusion opens.</td>
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