I. **Purpose**:
   A. To reduce morbidity and mortality associated with acute CVA
   B. To limit permanent disability associated with acute CVA

II. **Indications** (Class I)
   A. Time of onset (When patient was last seen as normal) < 4.5 hours prior to treatment
      a. Consider stroke severity, medical history and age in 3-4.5 hour window
   B. Clinical diagnosis of ischemic stroke with mild, moderate, or severe stroke symptoms
      a. Consider even if symptoms are rapidly improving
      b. Consider even if symptoms are mild but disabling
   C. Age: ≥ 18 years

III. **Contraindication**
   A. Exclusion criteria
      a. Suspcion of current subarachnoid hemorrhage or intracranial hemorrhage
      b. Hypertension unable to be safely lowered to <185/110mm Hg
      c. Aortic dissection
      d. Active internal bleeding
      e. Severe head trauma within the past 3 months
      f. Oral anticoagulant use with INR > 1.7
      g. Low molecular weight heparin within the last 24 hours with abnormal aPTT/ Factor X
   B. For select patient even with the following conditions, Alteplase administration should be considered after careful review of risk/benefits
      a. Pregnancy
      b. Clinical history of bleeding diathesis or coagulopathy
      c. Use of direct thrombin or direct factor Xa inhibitor if a aPTT, INR, platelet count, ecarin clotting time, thrombin time or direct factor Xa assays are normal, or if last dose > 48 hours prior
      d. Recent major surgery within last 14 days
e. Recent major trauma within last 14 days not including severe head trauma
f. Intracranial vascular malformations or neoplasms
g. Prior ischemic stroke within last 3 months
h. Patient who have had an arterial puncture of a noncompressible blood vessel within the past 7 days
i. History of intracranial hemorrhage
j. Current malignancy
k. Lumbar Dural puncture within the past 7 days
l. Cervical arterial dissection
m. Seizure at onset of acute stroke
n. Blood glucose <50 or > 400 mg/dl
o. Intracranial or spinal surgery within the past 3 months

C. UPMC stroke team can be consulted for clinical decision making
D. For questions regarding Alteplase inclusion and exclusion criteria refer to Stroke Reference Manual: Clinical Practice Guideline
   a. Scientific Rationale for the Inclusion and Exclusion criteria for intravenous Alteplase in Acute Ischemic Stroke (2016)
   b. Guidelines for the Early Management of Patients with Acute Ischemic Stroke (2018)

IV. Initial Evaluation
   A. CT
   B. CTA if indicated
   C. EKG
   D. Bedside Blood Glucose testing
   E. Lab work: Chem 8, type and screen, CBC, PT, PTT, INR, U/A, Troponin and CKMB
   F. Pregnancy test (in females of childbearing age)

** tPA (ACTIVASE®/alteplase) should not be delayed due to awaiting lab results**

V. Procedure
   A. The patient and/or patient’s family should be well informed by the physician of the potential complications of acute thrombolytic therapy including bleeding complications and/or death.
   B. I.V. t-PA should be administered as soon as possible after the diagnosis of acute cerebrovascular accident is established. Any physician may prescribe tPA (ACTIVASE®/alteplase); however, a neurology consultation is recommended.
C. Accurate weight required prior to infusion
D. Dose patient with tPA (ACTIVASE®/alteplase) 0.9 mg/kg (max. 90 mg) 10% bolus dose over one (1) minute and remainder infused over 60 minutes.
E. Ensure that patients’ blood pressure is < 185/110 prior to infusion and treat blood pressure if clinically indicated.
   a. See section VI for blood pressure management recommendations
F. Establish venous access
G. Obtain NIHSS 15 minutes x8 starting at the time of bolus (4 during the infusion and 4 after infusion), every 30 minutes x12, every 1 hour x16 hours, every 4 hours x6, daily, and then at discharge.
H. Obtain vital signs every15 minutes x8 starting at the time of bolus (4 during the infusion and 4 after infusion), every 30 minutes x12, every 1 hour x16 hours, every 4 hours x6, and then per unit protocol.
I. If neurological deterioration occurs:
   a. Stop infusion
   b. Notify physician immediately
   c. Signs and symptoms of bleeding
      1. Severe Headache
      2. Acute hypertension
      3. Nausea or vomiting
      4. Worsening neurological examination
J. Monitor for Major Bleeding: intracranial, retroperitoneal, gastrointestinal, or genitourinary hemorrhages.
K. Monitor for Minor Bleeding: gums, venipuncture sites, hematuria, hemoptysis, skin hematomas, or ecchymosis
L. Avoid venous puncture for the first 24 hours after infusion, Critical labs can be drawn
   a. If critical labs are drawn, ensure adequate pressure is held and monitor the site for bleeding.
M. No IM injections for 24 hours
N. Repeat CT scan 24 hours after tPA (ACTIVASE®/alteplase) was administered

VI. Blood pressure management medications
A. Management of Hypertension prior to tPA (ACTIVASE®/alteplase) administration and during tPA (ACTIVASE®/alteplase) administration
   a. If systolic blood < 185 or diastolic blood pressure of <110 cannot be achieved within 30 minutes by the above protocol it is advised NOT to proceed with tPA. Manage the hypertension crisis only and consider Cardene (Nicardpine) infusion.
   b. If patient previously responded to intermittent Labetalol injections, continue with Labetalol injections unless frequent dosing is required (greater than 2 doses within the first hour of the tPA (ACTIVASE®/alteplase) infusion). If frequent dosing of Labetalol is required, consider Cardene (Nicardpine) infusion.

B. Medications
   a. Labetalol 10 mg IV over 1-2 minutes. This dose may be repeated every 10 minutes without a maximum until satisfactory control is achieved.
      1. Monitor blood pressure every 10 minutes during Labetalol treatment and observe for development of hypotension or bradycardia.
      2. If contraindication to Labetalol (CHF, Bradycardia, bronchospasm) use Hydralazine regimen.
      3. ** If unable to achieve SBP < 185/110 after 2 doses, consider Cardene (Nicardpine) infusion
   b. Hydralazine 10 mg IV push every 10 minutes during Hydralazine treatment and observe for development of hypotension.
   c. Cardene (Nicardpine) Infusion per titration policy

VII. DELAY IN TPA (ACTIVASE®/alteplase) INFUSION: If there is a delay in alteplase infusion > 60 minutes and there is either a question of eligibility or a medical reason, the MD is required to document why there was a delay.

A. Eligibility Reasons:
   a. Social/ religious
   b. Initial Refusal
   c. Care- team unable to determine eligibility

B. Medical Reasons:
   a. Hypertension requiring aggressive control with IV medications. ( continuous infusion or IV push x2)
b. Further diagnostic evaluation to confirm stroke for patients with hypoglycemia (blood glucose <50), seizures, or major metabolic disorders.

c. Management of concomitant emergent/acute conditions such as cardiopulmonary arrest, respiratory failure (requiring intubation)

d. Investigational or experimental protocol for thrombolysis

VIII. General Consideration

A. Foleys are not required and should not delay initiation of Alteplase
B. Written consent is not required and should not delay initiation of Alteplase
C. Alteplase that is mixed only but not used will be replaced, prepare and mix as soon as initial criteria is met
D. CTA should not delay the administration of Alteplase

IX. Documentation

A. NIHSS, vital signs, and parameters assessment (these interventions should all match according to frequency)

a. NIHSS every 15 minutes x 8 starting at the time of bolus (4 during the infusion and 4 after infusion), every 30 minutes x12, every 1 hour x16 hours, every 4 hours x6, daily, and then at discharge.

b. Vital signs every 15 minutes x8 starting at the time of bolus (4 during the infusion and 4 after infusion), every 30 minutes x12, every 1 hour x16 hours, every 4 hours x6, and then per unit protocol.

B. E-Mar documentation for all administered medications
C. IV Spreadsheet
D. IV Invasive Line Flow sheet
E. Nursing notes when appropriate