



**OHSU HEALTH CARE SYSTEM  
PRACTICE GUIDELINE**

**Intravenous Administration of t-PA in Acute Ischemic Stroke, PS 01.12**

Last Reviewed Date: April 22, 2011

**POLICY STATEMENT:**

OHSU Hospitals and Clinics have adopted these practice guidelines in order to delineate a consistent, evidenced-based approach to treating the patient who presents with signs and symptoms consistent with acute stroke. Although these guidelines assist in guiding care, responsibility to determine appropriate care for each individual remains with the provider themselves.

<p><b>ED or Stroke Team Physician</b></p>	<p><b>Eligibility for IV Treatment With t-PA (Activase) determined by all of the following:</b></p> <ul style="list-style-type: none"> <li>• Clinical diagnosis of ischemic stroke causing a measurable neurological deficit.</li> <li>• Time of symptom onset well established to be <math>\leq 3</math> hrs before treatment starts. Select patients may be considered for treatment with symptom onset 3-4.5 hours.</li> <li>• Baseline CT: no intracranial hemorrhage or other significant risk factors per radiologist or stroke neurologist.</li> <li>• NIHSS to be completed by Stroke Team provider.</li> </ul>
<p><b>ED or Stroke Team Physician</b></p>	<p><b>Patient Selection: One or more of the following is a contraindication for t-PA:</b></p> <ul style="list-style-type: none"> <li>• Evidence of intracranial hemorrhage on baseline CT.</li> <li>• History of intracranial hemorrhage.</li> <li>• Uncontrolled hypertension at time of treatment (SBP &gt;185 or DBP &gt;110).</li> <li>• Requires aggressive treatment (IV drip) to reduce blood pressure to specified limits.</li> <li>• Suspicion of subarachnoid hemorrhage.</li> <li>• Active internal bleeding.</li> <li>• Any intracranial surgery, serious head trauma, or previous stroke within past 3 months.</li> <li>• History of intracranial neoplasm, AVM, or aneurysm.</li> <li>• Known bleeding diathesis, including but not limited to:             <ol style="list-style-type: none"> <li>1. current use of oral anticoagulants with PT &gt; 15 sec. or INR &gt; 1.7</li> <li>2. administration of heparin within 48 hrs and an elevated aPTT at presentation</li> <li>3. platelet count &lt;100,000.</li> </ol> </li> <li>• Only minor or rapidly improving stroke symptoms.</li> <li>•</li> </ul>

	<p>For 3-4.5 hours after onset: all of the above, plus,</p> <ol style="list-style-type: none"> <li>1. Greater than 80 years of age.</li> <li>2. Current use of oral anti-coagulants, even with INR less than or equal to 1.7.</li> <li>3. NIHSS greater than 25.</li> <li>4. History of both diabetes and stroke.</li> </ol>
<b>ED or Stroke Team Physician</b>	<p><b>Patient Selection: Warnings (presence of the following may increase the risk for intracranial hemorrhage after administering t-PA):</b></p> <ul style="list-style-type: none"> <li>• Seizure at onset of stroke.</li> <li>• CBG or serum glucose &lt;50 or &gt;400 mg/dL.</li> <li>• Lumbar puncture within 48 hrs.</li> <li>• History of GI or GU hemorrhage within 21 days.</li> <li>• Major surgery or serious trauma in previous 14 days.</li> <li>• Recent arterial puncture at noncompressible site.</li> <li>• Patients with INR between 1.4 to 1.7.</li> <li>• Patients with severe neurological deficit (e.g., NIH Stroke Scale &gt;22) at presentation. An increased risk of intracranial hemorrhage in these patients, despite improvement with t-PA has been demonstrated.</li> </ul>
<b>Stroke Team Physician or Clinical Stroke Coordinator with assistance of ED or NSICU Attending</b>	<p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• Dose of t-PA (Activase) is 0.9 mg/kg total, or maximum 90 mg (see attached, "<a href="#">Dosing Information for t-PA in Acute Ischemic Stroke, POS 01.12.A</a>")</li> <li>• Give 10% of total dose as IV bolus over 1 minute.</li> <li>• Remaining 90% infused over 60 minutes via IV pump. Start immediately after bolus.</li> <li>• Use vented tubing. No tubing changes can be made during t-PA infusion.</li> <li>• Evaluate the patient's need for invasive lines, nasogastric tube, foley catheter, or blood draws and initiate prior to thrombolytic therapy, if possible.</li> </ul>
<b>Stroke Team Physician or Clinical Stroke Coordinator with assistance of ED or NSICU Attending</b>	<p><b>Follow-up: Intracerebral Hemorrhage Management Guidelines</b></p> <ul style="list-style-type: none"> <li>• If clinical suspicion of intracerebral hemorrhage (e.g., neurological deterioration, new headache, acute hypertension, nausea or vomiting), discontinue t-PA infusion.</li> <li>• Obtain STAT CT scan for any neurological deterioration.</li> <li>• STAT labs: INR, PTT, platelet count, fibrinogen, type &amp; cross.</li> <li>• Prepare for administration of 6-8 units cryoprecipitated fibrinogen &amp; factor VIII. In Epic, one cryo pool equals 5 units of cryoprecipitate</li> <li>• Prepare for administration of 6-8 units platelets. In Epic, one unit of platelet pheresis leukoreduced product equals 6 units of platelets.</li> </ul>
<b>Neurosciences ICU Physician</b>	<p><b>Follow-up: General Patient Management</b></p> <ul style="list-style-type: none"> <li>• Admission to Neurosciences ICU for 24 hrs (initiate post thrombolytic therapy orders via <a href="#">NEU: Stroke/Rule out stroke/TIA Admission Orders</a> or <a href="#">NEU: Stroke Post Thrombolytic Therapy</a>).</li> <li>• No anti-coagulation or antiplatelet drugs during the infusion and for 24 hrs post infusion.</li> </ul>

	<ul style="list-style-type: none"> <li>• Avoid nasogastric tubes, new IV lines, blood draws, or invasive lines/procedures for 24 hrs. post infusion, if possible.</li> <li>• No intramuscular injections.</li> <li>• Head CT or MRI at 24 hours post infusion.</li> </ul>
<b>RN</b>	<b>Follow-up: General Patient Management</b> <ul style="list-style-type: none"> <li>• Starting from beginning of IV tPA infusion: Neuro checks &amp; vital signs every 15 minutes for 2 hours, every 30 minutes for 6 hours, every 1 hour for 16 hours, then per ICU standard of care.</li> <li>• Avoid nasogastric tubes, new IV lines, blood draws, or invasive lines/procedures for 24 hrs. post infusion, if possible.</li> <li>• If the patient already has an invasive line upon arrival from another hospital (i.e., arterial or central), observe very carefully for bleeding at the site and apply pressure as needed.</li> <li>• Maintain IV's already in place (restart only if necessary).</li> <li>• No intramuscular injections.</li> <li>• Observe for neuro changes and any signs/symptoms of intracerebral hemorrhage and document accordingly. Report any of the following immediately to the NSICU Team, pager 17014, and Stroke Team, pager 12600: neurologic deterioration, sudden marked changes in vital signs, changes in level of consciousness, nausea, vomiting, diaphoresis, new headache.</li> <li>• Observe for any signs of adverse drug reaction and document accordingly.</li> <li>• Report any of the following to the NSICU Team and the neurologist on call: gingival oozing, ecchymosis, petechiae, abdominal and/or flank pain, hemoptysis, hematemesis, shortness of breath, rales, rhonchi, arrhythmias.</li> <li>• Assess IV/arterial puncture sites, urine, gums, skin, stool, emesis, etc. for bleeding. Report to NSICU Team and the neurologist if this occurs.</li> <li>• Monitor extremities for color, temperature, and sensation.</li> <li>• Follow the Standard of Care for the <a href="#">Inpatient Management of the Acute Ischemic Stroke Patient</a>.</li> </ul>
<b>Physician and RN</b>	<b>Maintain Blood Pressure as follows:</b> <ol style="list-style-type: none"> <li> <b>1. Prior to t-PA treatment</b> <ul style="list-style-type: none"> <li>• For systolic &gt; 185 OR diastolic &gt; 110, give labetalol 10-20 mg IV over 1-2 minutes.</li> <li>• May repeat one time or nitropaste 1-2 inches or Nicardipine infusion, 5 mg/hour, titrate up by 2.5 mg/hour at 5-10 minute intervals, maximum dose 15mg/hour; when desired blood pressure is attained, reduce to 3 mg/hour.</li> <li>• If blood pressure does not decline and remains &gt; 185/110 mmHg, do not administer tPA.</li> </ul> </li> <li> <b>2. During or after t-PA treatment</b> <ul style="list-style-type: none"> <li>• Monitor blood pressure. Starting from the beginning of the IV tPA infusion, check blood pressure every 15 minutes for 2 hours, then every 30 minutes for 6 hours, and then every hour for 16 hours.</li> <li>• For systolic 180-230 OR diastolic 105-120 give labetalol 10 mg IV over 1-2 minutes. May repeat or double labetalol every 10-20 minutes to maximum dose of 300 mg or give initial labetalol dose, then start labetalol drip at 2-8 mg/min.</li> <li>• For systolic &gt;230 OR diastolic 121-140 give labetalol 10 mg IV over 1-2 minutes. May repeat or double labetalol every 10 minutes to maximum dose of 300 mg, or give initial labetalol dose, then start labetalol drip at 2-8 mg/min OR Nicardipine 5</li> </ul> </li> </ol>

	<p>mg/hour IV infusion as initial dose and titrate to desired effect by increasing rate by 2.5 mg/hour every 5 minutes to maximum of 15 mg/hour.</p> <ul style="list-style-type: none"> <li>• For diastolic &gt;140 give sodium nitroprusside 0.5 mcg/kg/min IV infusion initial dose and titrate to desired blood pressure.</li> </ul>
	<b>Call the Stroke Team, 503-494-9000, pager 12600, with any questions.</b>

### Bibliography:

- Adams, H. P., et al. (2007). Guidelines for the Early Management of Adults with Ischemic Stroke: A Guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups. *Stroke* (38), pp. 1655-1711.
- Del Zoppo, G. J., et al. (2009). Expansion of the time window for treatment of acute ischemic stroke with intravenous tissue plasminogen activator: A science advisory from the AHA/ASA. *Stroke* (40), pp. 1-4.
- Sacco, R. L., et al. (2006). Guidelines for Prevention of Stroke in Patients with Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals from the American Heart Association/American Stroke Association Council on Stroke. *Stroke*, 37, pp. 577-617.
- Summers, D., et al. (2009). Comprehensive Overview of Nursing and Interdisciplinary Care of the Acute Ischemic Stroke Patient: A Scientific Statement from the American Heart Association. *Stroke* 40, (8), pp. 2911-2944.

### Related Forms and Procedures:

- [Dosing Information for t-PA in Acute Ischemic Stroke, PS 01.12.A](#)

### Education & Training Resources: None

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