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

<table>
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<tr>
<th>ED or Stroke Team Physician</th>
<th>Eligibility for IV treatment with t-PA (Activase) is determined by all of the following:</th>
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<td>• Clinical diagnosis of ischemic stroke causing a measurable neurological deficit.</td>
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<td>• Time of symptom onset well established to be &lt;3 hours before treatment starts; select patients may</td>
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<td>be considered for treatment with symptom onset 3-4.5 hours.</td>
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<td>• Baseline CT: No intracranial hemorrhage or other significant risk factors per radiologist or stroke</td>
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<td>neurologist.</td>
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<td>• Neurosciences ICU to be completed by Stroke Team provider.</td>
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<thead>
<tr>
<th>ED or Stroke Team Physician</th>
<th>Patient selection: One or more of the following is a contraindication for t-PA:</th>
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<td>• Younger than 18 years old.</td>
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<td>• Evidence of intracranial hemorrhage on baseline CT.</td>
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<td>• History of intracranial hemorrhage.</td>
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<td>• Uncontrolled hypertension at time of treatment (SBP &gt;185 or DBP &gt;110).</td>
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<td>• Requires aggressive treatment (IV drip) to reduce blood pressure to specified limits.</td>
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<td>• Suspicion of subarachnoid hemorrhage.</td>
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<td>• Active internal bleeding.</td>
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<td>• Any intracranial surgery, serious head trauma or previous stroke within past three months.</td>
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<td>• History of intracranial neoplasm, AVM or aneurysm.</td>
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<td>• Only minor or rapidly improving stroke symptoms.</td>
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<td>• Known bleeding diathesis, including but not limited to:</td>
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<td></td>
<td>1. Current use of oral anticoagulants with PT &gt;15 sec. or INR &gt;1.7.</td>
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<td>2. Administration of heparin within 48 hours and an elevated aPTT at presentation.</td>
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<td>3. Platelet count &lt;100,000.</td>
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</tbody>
</table>

For 3-4.5 hours after onset: all of the above, plus:

• Older than 80 years of age.

• Current use of oral anti-coagulants, even with INR less than or equal to 1.7.

• NIHSS greater than 25.

• History of both diabetes and stroke.
### Patient selection: warnings (presence of the following may increase the risk for intracranial hemorrhage after administering t-PA):

- Seizure at onset of stroke.
- CBG or serum glucose <50 or >400 mg/dL.
- Lumbar puncture within 48 hours.
- History of GI or GU hemorrhage within 21 days.
- Major surgery or serious trauma in previous 14 days.
- Recent arterial puncture at noncompressible site.
- Patients with INR between 1.4 to 1.7.
- Patients with severe neurological deficit (e.g., NIH Stroke Scale >22) at presentation: An increased risk of intracranial hemorrhage in these patients, despite improvement with t-PA has been demonstrated.
- Recent acute myocardial infarction (within previous 3 month).

### Treatment:

- Dose of t-PA (Activase) is 0.9 mg/kg total, or maximum 90 mg (see Dosing & Administration Information for t-PA in Acute Ischemic Stroke.
- Give 10% of total dose as IV bolus over 1 minute.
- Remaining 90% infused over 60 minutes via IV pump. Start immediately after bolus.
- Use vented tubing: No tubing changes can be made during t-PA infusion.
- Evaluate the patient’s need for invasive lines, nasogastric tube, foley catheter and initiate prior to thrombolytic therapy, if possible.

### Follow-up: intracerebral hemorrhage management guidelines

- If clinical suspicion of intracerebral hemorrhage (e.g., neurological deterioration, new headache, acute hypertension, nausea or vomiting), discontinue t-PA infusion.
- Obtain STAT CT scan for any neurological deterioration.
- STAT labs: INR, PTT, platelet count, fibrinogen, type and screen.
- Prepare for administration of two pools of cryoprecipitated fibrinogen.
  - In Epic, one cryo pool equals five units of cryoprecipitate.
- Prepare for administration of one unit platelets.
  - In Epic, one unit of plateletpheresis leukoreduced product equals six units of platelets.
- Prepare for administration of two units fresh frozen plasma.

### Follow-up: general patient management

- Admission to Neurosciences ICU for 24 hours (initiate post-thrombolytic therapy orders via NEU: Stroke/Rule Out Stroke/TIA Admission Orders or NEU: Stroke Post-Thrombolytic Therapy).
- No anti-coagulation or antiplatelet drugs during the infusion and for 24 hours post-infusion.
- Avoid nasogastric tubes or invasive lines/procedures for 24 hours post infusion, if possible.
- No intramuscular injections.
- Head CT or MRI at 24 hours post-infusion.
R.N. Follow-up: general patient management

- Starting from beginning of IV t-PA infusion: Neuro checks and vital signs every 15 minutes for two hours, every 30 minutes for six hours, every hour for 16 hours, then per ICU standard of care.
- Avoid nasogastric tubes or invasive lines/procedures for 24 hours post-infusion, if possible.
- 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.
- Maintain IVs already in place (restart only if necessary).
- No intramuscular injections.
- Observe for neurological changes and any signs/symptoms of intracerebral hemorrhage and document accordingly.
- Report any of the following immediately to the Neurosciences ICU Team, pager 17014, and Stroke Team, pager 12600: neurologic deterioration, sudden marked changes in vital signs, changes in level of consciousness, nausea, vomiting, diaphoresis or new headache.
- Observe for any signs of adverse drug reaction and document accordingly.
- Report any of the following to the Neurosciences ICU Team and the neurologist on call: gingival oozing, ecchymosis, petechiae, abdominal and/or flank pain, hemoptysis, hematemesis, shortness of breath, rales, rhonchi or arrhythmias.
- Assess IV/arterial puncture sites, urine, gums, skin, stool, emesis, etc. for bleeding. Report to NSICU Team and the neurologist if this occurs.
- Monitor extremities for color, temperature and sensation.
- Follow the Standard of Care for the Inpatient Management of the Acute Ischemic Stroke Patient.

Physician and R.N. Maintain blood pressure as follows:

1. Prior to t-PA treatment:
   - For systolic >185 or diastolic >110, give labetalol 10-20 mg IV over 1-2 minutes.
   - May repeat one time or Nicardipine infusion, 5 mg/hour, titrate up by 2.5 mg/hour at 5-15 minute intervals, maximum dose 15mg/hour; when desired blood pressure is attained, adjust as needed to maintain desired blood pressure.
   - If blood pressure does not decline and remains >185/110 mmHg, do not administer t-PA.

2. During or after t-PA treatment:
   - Monitor blood pressure. Starting from the beginning of the IV t-PA infusion, check blood pressure every 15 minutes for two hours, then every 30 minutes for six hours and then every hour for 16 hours.
   - For systolic >180 or diastolic >105, give labetalol 10 mg IV over 1-2, or Nicardipine infusion, 5 mg/hour, titrate up by 2.5 mg/hour at 5-15 minute intervals, maximum dose 15mg/hour.

Call the Stroke Team, 503 494-9000, pager 12600, with any questions.
Bibliography:

Related forms and procedures:
Dosing Information for t-PA in Acute Ischemic Stroke, HC.STK.101.GD
Acute Stroke Practice Guideline for Inpatient Management of Ischemic Stroke and Transient Ischemic Attack (TIA), HC.STK.102.HD

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OHSU Nursing Practice Council (2007)
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Neurosciences Best Practice Committee, 2008
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