Use of IV rtPA for Acute Ischemic Stroke: Inclusion and Exclusion Characteristics

Patients Who Could Be Treated With rtPA Within *3 Hours* From Symptom Onset*

Inclusion Criteria

- Diagnosis of ischemic stroke causing measurable neurologic deficit
- Onset of symptoms <3 hours before beginning treatment
- Age ≥18 years

Exclusion Criteria

- Head trauma or prior stroke in previous 3 months
- Symptoms suggest subarachnoid hemorrhage
- Arterial puncture at noncompressible site in previous 7 days
- History of previous intracranial hemorrhage
- Elevated blood pressure (systolic >185 mm Hg or diastolic >110 mm Hg)
- Evidence of active bleeding on examination
- Acute bleeding diathesis, including but not limited to
  - Platelet count <100 000/mm^3
  - Heparin received within 48 hours, resulting in aPTT >upper limit of normal
  - Current use of anticoagulant with INR >1.7 or PT >15 seconds
- Blood glucose concentration <50 mg/dL (2.7 mmol/L)
- CT demonstrates multilobar infarction (hypodensity >⅓ cerebral hemisphere)

Relative Exclusion Criteria

Recent experience suggests that under some circumstances—with careful consideration and weighing of risk to benefit—patients may receive fibrinolytic therapy despite 1 or more relative contraindications. Consider risk to benefit of rtPA administration carefully if any one of these relative contraindications is present:

- Only minor or rapidly improving stroke symptoms (clearing spontaneously)
- Seizure at onset with postictal residual neurologic impairments
- Major surgery or serious trauma within previous 14 days
- Recent gastrointestinal or urinary tract hemorrhage (within previous 21 days)
- Recent acute myocardial infarction (within previous 3 months)

Patients Who Could Be Treated With rtPA From *3 to 4.5 Hours* From Symptom Onset†

Inclusion Criteria

- Diagnosis of ischemic stroke causing measurable neurologic deficit
- Onset of symptoms 3 to 4.5 hours before beginning treatment

Exclusion Criteria

- Age >80 years
- Severe stroke (NIHSS >25)
- Taking an oral anticoagulant regardless of INR
- History of both diabetes and prior ischemic stroke

Notes

- The checklist includes some US FDA–approved indications and contraindications for administration of rtPA for acute ischemic stroke. Recent AHA/ASA guideline revisions may differ slightly from FDA criteria. A physician with expertise in acute stroke care may modify this list.
- Onset time is either witnessed or last known normal.
- In patients without recent use of oral anticoagulants or heparin, treatment with rtPA can be initiated before availability of coagulation study results but should be discontinued if INR is >1.7 or PT is elevated by local laboratory standards.
- In patients without history of thrombocytopenia, treatment with rtPA can be initiated before availability of platelet count but should be discontinued if platelet count is <100 000/mm^3.

Abbreviations: aPTT, activated partial thromboplastin time; FDA, Food and Drug Administration; INR, international normalized ratio; NIHSS, National Institutes of Health Stroke Scale; PT, prothrombin time; rtPA, recombinant tissue plasminogen activator.

Stroke: Treatment of Hypertension

Potential Approaches to Arterial Hypertension in Acute Ischemic Stroke Patients Who Are Potential Candidates for Acute Reperfusion Therapy*

Patient otherwise eligible for acute reperfusion therapy except that blood pressure is >185/110 mm Hg:

- Labetalol 10-20 mg IV over 1-2 minutes, may repeat × 1, or
- Nicardipine IV 5 mg per hour, titrate up by 2.5 mg per hour every 5-15 minutes, maximum 15 mg per hour; when desired blood pressure is reached, lower to 3 mg per hour, or
- Other agents (hydralazine, enalaprilat, etc) may be considered when appropriate

If blood pressure is not maintained at or below 185/110 mm Hg, do not administer rtPA.

Management of blood pressure during and after rtPA or other acute reperfusion therapy:

Monitor blood pressure every 15 minutes for 2 hours from the start of rtPA therapy, then every 30 minutes for 6 hours, and then every hour for 16 hours.

If systolic blood pressure 180-230 mm Hg or diastolic blood pressure 105-120 mm Hg:

- Labetalol 10 mg IV followed by continuous IV infusion 2-8 mg per minute, or
- Nicardipine IV 5 mg per hour, titrate up to desired effect by 2.5 mg per hour every 5-15 minutes, maximum 15 mg per hour

If blood pressure not controlled or diastolic blood pressure >140 mm Hg, consider sodium nitroprusside.

Approach to Arterial Hypertension in Acute Ischemic Stroke Patients Who Are *Not* Potential Candidates for Acute Reperfusion Therapy*

Consider lowering blood pressure in patients with acute ischemic stroke if systolic blood pressure >220 mm Hg or diastolic blood pressure >120 mm Hg.

Consider blood pressure reduction as indicated for other concomitant organ system injury:

- Acute myocardial infarction
- Congestive heart failure
- Acute aortic dissection

A reasonable target is to lower blood pressure by 15% to 25% within the first day.

*Adams HP Jr, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, Furlan A, Grubb RL, Higashida RT, Jauch EC, Kidwell C, Lyden PD, Morgenstern LB, Qureshi AI, Rosenwasser RH, Scott PA, Wijdicks EFM. 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.* 2007;38:1655-1711.

†del Zoppo GJ, Saver JL, Jauch EC, Adams HP Jr; on behalf of the American Heart Association Stroke Council. Expansion of the time window for treatment of acute ischemic stroke with intravenous tissue plasminogen activator: a science advisory from the American Heart Association/American Stroke Association. *Stroke.* 2009;40:2945-2948.