

STROKE (ACUTE ISCHEMIC STROKE)

(Last updated 05/02/2019; Reviewers: Hong Bo, MD.)

PRESENTING COMPLAINT: Headache, aphasia, neurologic deficit

FINDINGS

- **A** Check airway (intubation if patients with decreased consciousness or bulbar dysfunction)
- **B** ↓RR, ↓work of breathing
- **C** ↓↑BP, atrial fibrillation
- **D** Acute-onset focal neurologic findings, vomiting (increased intracranial pressure), hemianopia, hemiparesis, hemianesthesia, focal signs with altered level of consciousness
- **E** Palpation of pulses
- **L_{PC}** Non-specific, glucose, Troponin, CBC (platelets), coagulation markers (PT, aPTT, INR)
- **U_{PC}** NA

***V** (verbal), **P** (pain), **U** (unconsciousness), **D** (delirious)

U_{PC} (point of care ultrasound) **L_{PC}** (point of care labs)

OTHER HISTORY

PREDISPOSING FACTORS: Atrial fibrillation, peripheral vascular disease, hypertension, hyperlipidemia, diabetes mellitus, venous thromboembolism (with patent foramen ovale), heart valve disease/artificial valve and vasculitis

DIFFERENTIAL DIAGNOSIS

Intracerebral hemorrhage, Todd's paralysis (post-ictal phenomenon), complicated migraine, hypoglycemia, intra-cranial mass lesion (tumor, abscess, etc.), non-organic/functional spell, recrudescence of prior stroke symptoms in the setting of metabolic derangement/infection

OTHER INVESTIGATIONS:

- **Severity Score:** National Institutes of Health Stroke Scale (NIHSS)
- **Labs:** Electrolytes, renal function; If indicated: infectious evaluation (UA, blood cultures), drug screen
- **Monitoring:** Cardiac and blood pressure monitoring
- **Imaging:** Non-contrast CT head (NCCT): to exclude or confirm hemorrhage in the hyperacute phase; CT angiogram: if large/hemispheric stroke that may be amenable to endovascular therapy; stat MRI if available and will not delay treatment. In special situations a CT perfusion may be beneficial.

THERAPEUTIC INTERVENTIONS

- **Medications:**
 - Antihypertensives (for TPA-treated patients keep blood pressure <185/110 mm Hg); IV Push: labetalol 10 mg IV, hydralazine 10 mg IV; Infusion: nicardipine 5-15 mg/hr
 - Ischemic stroke treatment: IV tissue plasminogen activator (TPA): Must be given within 3-4.5 hours of time the patient was LAST KNOWN NORMAL and in the absence of contraindications. *See formal guideline for specific time window requirements and complete list of contraindications; dosing: 0.9 mg/kg, max dose 90 mg. 10% of total dose is given as a bolus over 1-2 minutes, the remainder is infused over 1 hour; if TPA is given – no other antithrombotics may be used for 24 hours)
 - Non-TPA eligible patients with ischemic stroke – additional therapy is dependent on stroke cause: Antiplatelet (aspirin or clopidogrel), lipid-lowering agent (statin) if total cholesterol >200 mg/dL or if LDL > 100 mg/dL, Inticoagulation for atrial fibrillation (typically deferred in the acute-subacute stroke setting to avoid the risk of hemorrhagic conversion. Consider initiating 10-14 days after the stroke in most situations.)
- **Procedures:** Endovascular clot retrieval for proximal vessel occlusions (internal carotid, middle cerebral artery, basilar artery). Treat within 6 hours of symptom onset/last known normal; may extend window for basilar artery occlusion.
- **Consult:** Neurology +/- interventional neuroradiology
- **Anxiolysis & Sedation:** Avoid neurotropic medications to allow for frequent neurologic assessments.

ONGOING TREATMENT

- **Follow-Up:** Frequent neurologic examinations to identify worsening, particularly if the patient underwent thrombolysis or endovascular clot retrieval.
- **Further diagnostics:** Determine the cause of the stroke. Evaluation may include transesophageal echocardiogram, MRI (if not already completed), carotid ultrasound or CT/MR angiogram, hypercoagulability evaluation, lipid panel.
- **Further Treatment:** Dependent on cause of stroke.
- **For all patients:** Physical/occupational therapy, speech therapy if aphasic, dysphagia screen and discussion of percutaneous endoscopic gastrostomy (PEG) if the patient does not pass.
- **Manage Complications:** Malignant cerebral edema from large infarcts: for young patients (<60 years), may consider decompressive hemicraniectomy as a life-saving intervention, with careful

discussion with patient/family that the disability from the stroke will remain; early prophylaxis for deep vein thrombosis.

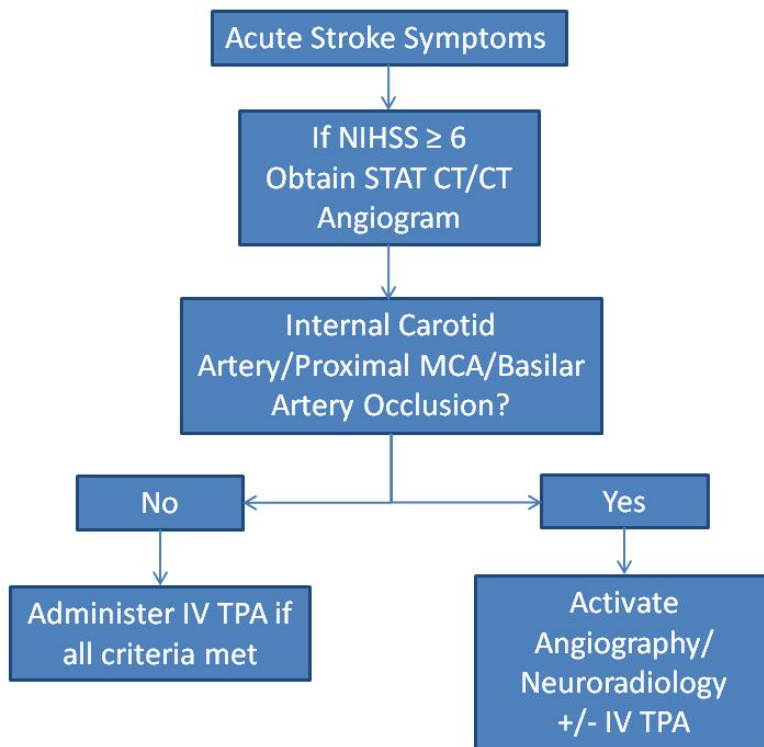
- Prophylaxis

Deep vein thrombosis: sequential compression devices, subcutaneous heparin (may hold pharmacologic prophylaxis early in large strokes, patients who received TPA). GI prophylaxis is not routinely indicated.

CAUTIONS

Complications: Malignant cerebral edema, hemorrhagic conversion, aspiration pneumonia, DVT, seizure

ALGORITHM



REFERENCES AND ACKNOWLEDGMENTS

ACKNOWLEDGMENT: Sherri A. Braksick, MD; Xavier Fonseca, MD; Alejandro A. Rabinstein, MD;

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- Powers WJ, et al. "2015 AHA/ASA Focused Update of the 2013 Guidelines for the Early Management of Patients With Acute Ischemic Stroke Regarding Endovascular Treatment." *Stroke*. (2015).