# Suspected Stroke/Transient Ischemic Attack

### Aliases

Cerebrovascular accident (CVA), TIA

### Patient Care Goals

1. Detect neurological deficits
2. Determine eligibility for transport to a stroke center

## Patient Presentation

1. Neurologic deficit such as facial droop, localized weakness, gait disturbance, slurred speech, altered mentation
2. Hemiparesis or hemiplegia
3. Dysconjugate gaze, forced or crossed gaze (if patient is unable to voluntarily respond to exam, makes no discernible effort to respond, or is unresponsive)
4. Severe headache, neck pain/stiffness, difficulty seeing

### Inclusion Criteria

1. Patient has signs and symptoms consistent with stroke or transient ischemic attack (TIA)

### Exclusion Criteria

1. If glucose less than 60 mg/dL, treat per the Hypoglycemia guideline
2. If trauma and GCS less than or equal to 13, treat per the Head Injury and General Trauma Management guidelines

## Patient Management

### Assessment

1. Use a validated prehospital stroke scale that may include, but is not limited to:
    a. BE-FAST Stroke Scale
        - Facial smile/grimace—ask patient to smile
        - Balance: Sudden loss of balance
        - Eyes: Vision changes
        - Face: Asymmetry, ask patient to smile/grimace
        - Arm or Leg Weakness: Ask patient to close eyes and hold out arms for count of 10 seconds, lift each leg up for count of 10 seconds
        - Speech: Trouble speaking, slurred speech, confused responses. May ask patient "You can't teach an old dog new tricks" to assess for slurred speech
        - Time: Determine last known well time, suspect symptom onset
2. Pertinent historical data includes:
    a. History—"last known well time" and source of that information
    b. Neurologic status assessment [see Appendix VII]
    c. Medication—patient is taking warfarin or any anticoagulant medication
3. Evaluate for the presence of stroke mimics including:
    a. Hypoglycemia
    b. Seizure
    c. Sepsis
    d. Migraine
    e. Intoxication
    f. Medications side effect such as dystonic reactions

**Treatment and Interventions**

1. Determine "last known well" time.
2. Administer **oxygen *[EMR]*** as appropriate for dyspnea or distress with a target of achieving greater than 93% saturation for most acutely ill patients.
3. Treat seizures per Seizures guideline, if seizure activity present.
4. Check **blood glucose** level
    a. Treat only if glucose less than 60 mg/dL.
5. Acquire **12-lead ECG**, if possible.
6. Use the **local stroke plan** for hospital notification
    a. **Patients should be transported to the local emergency department unless**
        - Time difference between the local hospital and another hospital with additional stoke treatments capability is less than 30 minutes
        - Patient has medical comorbidities (i.e. dialysis, recent procedure) or concurrent condition (i.e. trauma, STEMI) that would more appropriately be treated at a tertiary care center
        - High suspicion for intracranial hemorrhage
7. Monitor vital signs closely.
    a. Blood pressure should NOT be actively treated empirically in a patient with suspected CVA/TIA unless the hypertension is extreme (systolic blood pressure >220 mmHg or diastolic blood pressure >120 mmHg), or the patient has active ischemic coronary disease, heart failure, aortic dissection, hypertensive encephalopathy, acute renal failure, or pre-eclampsia/eclampsia. **Discuss treatment recommendations with Medical Consultation Physician**
8. Blood Pressure Management Options in conjunction with **Medical Consultation Physician** (see medication protocol for dosing parameters)
    a. **Labetalol [PARA]**
    b. **Nicardipine [PARA/Inter-facility]**
    c. **Hydralazine [PARA]**
    d. **Nitroglycerine infusion [PARA]**: only if no other option or being used to treat concurrent cardiac event
9. Continue Thrombolytic Therapy if initiated at sending facility [PARA/Inter-Facility]
    a. Ensure thrombolytic is running via a dedicated line to avoid dilution of drug.
    b. Transport should NOT be delayed to complete administration of thrombolytic at sending facility
        - EMS can treat most adverse reactions and post-thrombolytic intracranial hemorrhage is best managed at the tertiary care center
    c. Additional Considerations for management of patient
        - Perform and document initial neurologic exam, including stroke scale, and reassess and document neurologic exam every 15 minutes.
        - Use manual blood pressure cuff if antecubital IV site.
        - Monitor for signs of hemorrhage: acute worsening of neurological status as compared to baseline neuro assessment or Glasgow Coma Scale, sudden onset of headache, nausea, and/or vomiting, sudden elevation in blood pressure and/or bradycardia.
        - Monitor for signs of angioedema (throat or mouth edema, difficulty breathing). [More common with patients on ACE inhibitors]

**Patient Safety Considerations**

1. Prevent aspiration—elevate head of stretcher 15–30 degrees if systolic BP greater than 100 mm Hg.
    a. Maintain head and neck in neutral alignment, without flexing the neck.
2. Protect paralyzed limbs from injury.
3. Avoid multiple IV attempts.

## Notes and Educational Pearls Key Considerations

### Adult care

- Base transport and destination decisions on local resources and stroke system of care.
    - Destinations hospitals may include:
        - Stroke Ready
        - Primary Stroke Center
        - Comprehensive Stroke Center
- Do not treat hypertension in most cases.
- Place on ECG cardiac monitor.

### Pediatric care

- Treatment principles remain the same
- Although rare, pediatric patients can have strokes
- Stroke scales are not validated for pediatric patients

## Quality Improvement

### Associated NEMSIS Protocol(s) (eProtocol.01)

9914145—Medical-Stroke/TIA

### Key Documentation Elements

- Specific "last seen normal" time
    - If the patient was last seen normal prior to bedtime the night before, this is the time to be documented (not time the patient woke up with symptoms present)
- Blood glucose results
- Specific validated stroke scale used and findings
- Time of notification to receiving hospital

### Performance Measures

- Documentation of time "last seen normal"
- Use of validated stroke scare
- Blood glucose level obtained
- EMS scene time minimized (goal: less than 20 minutes)
- Hospital stroke team pre-arrival alert or activation occurred as early as possible after positive stroke assessment finding
- ***EMS Compass® Measures*** *(for additional information, see www.emscompass.org)*
    - *Stroke-01: Suspected stroke receiving prehospital stroke assessment.* To measure the percentage of suspected stroke patients who had a stroke assessment performed by EMS
    - *Stroke-08: Emergency Department Diagnosed Stroke Identified by Prehospital Stroke Assessment.* Measures the percentage of emergency department diagnosed stroke patients who had a positive stroke assessment by EMS
        - ***NOTE:*** This measure can only be evaluated if EMS documentation can be combined with information provided by the receiving hospital

### References


1. Jauch EC, Saver JL, Adams HP Jr, et al. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2013;44(3):870-947.
2. www.strokeassociation.org. Accessed August 28, 2017.