

# Large Vessel Stroke: Management Algorithm

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Prior to making any medical decisions, please view our disclaimer.

## Diagnostic Criteria

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- Clinical Large Vessel Syndromes: Infarction due to low flow or artery-to-artery embolism in the presence of disease in the ipsilateral arterial tree (extracranial or intracranial segments of carotid or vertebrobasilar arteries, or proximal MCA)
- Brain imaging with infarction in the territory of a large vessel

### Features suggestive of low flow infarction

- Stereotyped TIAs
- Borderzone infarction
- Evidence of hemodynamically significant stenosis by imaging or BP-dependent clinical symptoms

## Differential Dx

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- Embolic
- Lacunar
- Other Mechanism

### Features suggestive of artery-to-artery embolism

- Repetitive, non-stereotyped TIAs referable to the large vessel stenosis
- Amaurosis fugax (transient monocular blindness)
- Multifocal or peripheral cortical or subcortical infarction
- Absence of hemodynamic symptom threshold

## Phase 1

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### Additional Diagnostic Testing

- Consider further testing to distinguish low flow from artery-to-artery embolic infarction. This might include TCD or other neurovascular imaging, as well as perfusion imaging (MR, CT, PET, SPECT) in some cases
- Consider fasting lipids, lipoprotein (a), B12, folate, homocysteine
- Consider cardiac stress test +/- thallium imaging
- Consider myocardial ischemia or arrhythmia when faced with evidence of global hypoperfusion injury (e.g., bilateral borderzone infarction or hypoxic encephalopathy)
- Consider amount and functions of territory at risk when evaluating risk-benefit profile of planned interventions
- Pre-operative cardiac risk assessment prior to CEA or general anesthesia.

### Prevention of Acute Recurrent Stroke

- Initiate anticoagulation with unfractionated heparin, LMW heparin or heparinoids unless contraindications for anticoagulation or no remaining territory at risk. Use heparin bolus only in patients with fluctuating deficits, critical carotid or basilar artery stenosis
- Consider Hirudin or other non-heparin anticoagulants in patients with HIT
- Consider induced hypertension to determine if symptoms can be ameliorated with augmented CBF. Avoid sustained hypertension (SBP>180 after day 1) in patients with large infarcts and no BP symptom threshold.
- Consider extracranial carotid angioplasty, stenting or endarterectomy in those with TIA or minor strokes and high-grade stenosis (but not ICA occlusion).
- Consider intracranial angioplasty or stenting of carotid, MCA or basilar arteries in patients failing maximal medical therapy.
- Consider neuroprotective therapies

## Phase 2

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### Subacute Medical Management

Communicate with PCP

- Avoid acute BP reductions except in setting of coronary ischemia or impaired cardiac contractility
- Check HIT antibody in patients with decreasing platelet counts on heparin therapy (including SQ or heparin flushes)
- Maintain euthermia, euglycemia, eunatremia
- Consider Intensive Care management (e.g., airway compromise, severe hypertension, acute MI, cerebral edema, hydrocephalus, major organ dysfunction)
- Consider hemicraniectomy for hemisphere refractory cerebral edema and impending herniation
- Repeat imaging to assess stroke evolution and hemorrhagic transformation

Ongoing Assessments

- DVT risk if immobile
- Ability to urinate; UTI
- Ability to swallow; Aspiration; need for feeding tube
- GI/GU bleeding
- Cardiopulmonary function; need for tracheostomy

### **Functional Assessment and Acute Rehabilitation**

Communicate with other healthcare personnel

- safety for ADL, ambulation
- urinary and fecal continence
- Tone and splinting
- Exercise tolerance
- Cognitive function

## **Phase 3**

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### **Discharge Planning**

Discuss with patient and family

1. treatment and prognosis
2. risk factors and risk reduction strategies

Assess subacute rehabilitation needs and eligibility (consider PM&R consult)

1. Short v. long term care needs
2. Inpatient rehabilitation v. skilled nursing facility rehabilitation
3. Home v. outpatient services

Assess financial resources to cover cost of

1. Inpatient, outpatient rehabilitation services
2. Medications
3. Assistive devices (e.g., commode, cane, wheelchair, hospital bed, etc.)
4. Long term care

### **Long term Secondary Prevention**

Risk factor modification

1. Hypertension control
2. Lipid reduction
3. Smoking cessation
4. Nutrition counseling and glycemic control
5. Weight reduction and increased physical activity

6. Anticoagulation or Antiplatelet therapy

Medical Considerations

1. Duration of anticoagulation +/- antiplatelet agent
2. Consider angioplasty, stenting, CEA
3. Consider statins for mild hyperlipidemia
4. Provide adequate followup with stroke specialist
5. Consider secondary prevention or recovery trials

Patient education

1. Patient/family understands stroke diagnosis
2. Patient/family understands how to lower risk

**Authoring Information**

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