CEREBROVASCULAR ACCIDENTS & TIA’s
Maggie Kelly

History:
Onset of symptoms - exact time
Previous sx’s suggestive of TIA’s
Progression of symptoms
Headache?
Medications
Past history of CVA, clotting events

RF:
Modifiable:
HTN
Diabetes
Smoking
Cholesterol
Carotid stenosis
Atrial fib/flutter

Nonmodifiable:
Age
Male
African American

Is this pt’s brain dysfunction due to ischemia? Onset & progression of sx; location of deficit

Time Course
<table>
<thead>
<tr>
<th>Etiology</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrombotic</td>
<td>Fluctuating, progressive, stepwise</td>
</tr>
<tr>
<td>Embolic</td>
<td>Sudden onset, maximal @ onset, larger deficit</td>
</tr>
<tr>
<td>Lacunar</td>
<td>Develop deficit over hours with improvement over days</td>
</tr>
<tr>
<td>Intracerebral hemorrhage</td>
<td>Headache, progressive deficit over hours</td>
</tr>
<tr>
<td>Subarachnoid hemorrhage</td>
<td>Instant headache, focal deficit less common</td>
</tr>
<tr>
<td>Etiology</td>
<td>Associated symptoms</td>
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<td>--------------------------------------------</td>
</tr>
<tr>
<td>Thrombotic</td>
<td>Hx TIA’s</td>
</tr>
<tr>
<td>Embolic</td>
<td>Valsalva can trigger (PFO), fever→endocarditis</td>
</tr>
<tr>
<td>Lacunar</td>
<td></td>
</tr>
<tr>
<td>Intracerebral hemorrhage</td>
<td>HA after deficit onset, seizures, vomiting</td>
</tr>
<tr>
<td>Subarachnoid hemorrhage</td>
<td>Severe HA @onset, vomiting</td>
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</table>

**Approach to CVA:**

**Airway**
Breathing: increased ICP, vertebrobasilar ischemia can impair breathing

**Circulation:** BP

**Neurologic status**

**GCS:** Score <9 poor prognosis; Needs ICU

**Eye opening**
- Spontaneous: 4
- Response to speech: 3
- Response to poin: 2
- None: 1

**Best verbal response**
- Oriented: 5
- Confused: 4
- Inappropriate: 3
- Incomprehensible: 2
- None: 1

**Best motor response**
- Obeying: 6
- Localizing: 5
- Withdrawing: 4
- Flexing: 3
- Extending: 2
- None: 1

**PE:** Neck/vascular: bruits
Skin: ecchymosis, petechiae
Heart: rhythm esp afib
BP: both arms

**Neuro:** gross motor, CN, cerebellar if pt able, level of consciousness
Lacunar CVA: pure motor hemiparesis or pure sensory deficits, dyarthria-clumsy hand, ataxia-hemiparesis

Crossed deficits: (ie unilateral CN dysfunction) brainstem CVA

Altered consciousness/coma: brainstem or bilateral hemispheric involvement (bleed or new CVA opposite old CVA)

Non-contrast CT
Fast, cheap
Sensitive for ischemia after 24 hr
Sensitive for hemorrhage (>98%)

Findings in ischemia:
- Normal within 24 hours
- Parenchymal hypodensity
- Focal brain swelling
- Hyperdense MCA

If tumor suspected, order MRI

Thrombolytic therapy for ischemic CVA
Eligible pt must present within THREE hours of onset of sx
Requires ICU or stroke unit
Limitations: only 7-12% of CVAs qualify for tx, success depends on experience. 6% intracerebral hemorrhage. 30% reocclusion
Unless you are experienced, refer eligible pt with CVA to “stroke team” or consult neuro

How about heparin & coumadin in ischemic CVA’s? *not eligible for thrombolysis
No difference in outcomes, even among pt with neuro deterioration
Anticoagulate indicated in:
- Afib
- Severe CHF with EF < 30%
- Prosthetic or diseased valves
- PFO, aortic atheroma—controversial
- Otherwise ASA adequate

Other labs: CBC/plt, lipid panel
- Lytes, BUN, Cr, liver function
- Stat glucose, sed rate
- ECG/CXR, tox screen
- PT/PTT, fam hx of thrombosis ACL antibodies
Other evaluation:
- echo: if + cardiac hx or probable embolic CVA (TTE)
- Duplex U/S of neck or transcranial Doppler ant cx
- Doppler of vertebral aa & subclavian if posterior cx TIA

**BP**

<table>
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<tr>
<th>Condition</th>
<th>Treatment</th>
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<tr>
<td>Ischemic CVA (thrombotic or embolic)</td>
<td>Treat BP &gt; 220/120</td>
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<tr>
<td>Intracerebral hemorrhage</td>
<td>Treat if SBP &gt; 170</td>
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Labetolol is antihypertensive of choice in acute situations

**Other medical management:**
- dx and tx fever (with CVA assoc with poor outcome)
- Treat hyperglycemia to < 180
- SQ heparin prophylaxis & leg stockings in ischemic CVA who are nonambulatory

Admit with post stroke rehab in mind:
- SW consult: in all cases except for pt who are able to ambulate with supportive family
- NPO/speech therapy consult with any aphasia, dyarthria, impaired gag, impaired consciousness. Consider swallowing study
- PT consult
- Mobilize when able

**Family Education:**
- Assess family preferences and ability and interest to care for pt
- Arrange for appliances if going home (SW)
- Anticipate high incidence of depression

**Minimizing risk of next CVA**
- ASA asap for ischemic CVAs reduces recurrences
- BP: JNC7 goals 2-3 weeks after CVA
- LDL < 100
- Endarterectomy for stenosis > 70% with nondisabling CVA
- Anticoagulate for afib
- Stop smoking
TIA
Sudden onset of neuro deficit which resolves
  Low flow: brief, stereotyped deficit
  Embolic: single, prolonged
FACTS: 50% of TIAs have MRI evidence of CVA esp deficits >30'
  Risk of CVA after TIA: 5% @48h, 11% @30 days, 18% @90 days
Ref: Johnston, SC, JAMA 2000: 284-2901
Management
Any TIA presenting within 48-72h of onset should be managed as CVA=hosp
Evaluate for carotid stenosis and source of emboli (TTE)
Consult neuro (suggestions for anticoag)
Only ASA proven to be effective anticoag unless afib, thrombus

SUMMARY
New neuro deficit is an emergency
Hx, PE, CT without contrast are primary tools for eval
Ischemia CVA within 90' onset of sx should be considered for thrombolysis
In some settings CVAs are referred to stroke teams
FP takes primary responsibility for identification of CVA/TIA, post stroke care, minimizing future risk of CVA's