Management of Transient Ischemic Attack (TIA)

Goal: Risk stratification and streamline evaluation and disposition of patients with TIA.

Key Points:
- Decrease risk of stroke recurrence in patients with TIA.
- Treatment of secondary risk factors in patients with TIA.

Initial Assessment / Triage
- Use National Institutes of Health (NIH) Stroke Scale to assess patient for signs/ symptoms of stroke.
- Rapidly assess from initial time of symptom onset (last know well time (LKW)) per patient and/or family.
- ABCD² Score for TIA.

Making the Diagnosis

Emergency Department
- If symptoms have resolved, consult Neurovascular for TIA evaluation.
- Refer to NIH Stroke Scale.
  - Document on all patients.

Inpatient
- Consult Neurovascular.

Confirming the Diagnosis

TIA Evaluation – For All Patients
- Imaging:
  - Head CT - initial evaluation.
  - MRI brain scan without contrast.
  - MRA or CTA of brain and neck.
  - Carotid Doppler if MRA and CTA are medically contraindicated.
  - Transcranial Doppler if MRA and CTA are medically contraindicated.
- Glucose (HbA1c).
- CBC with platelet count.
- Electrolytes, BUN, creatinine.
- PT / INR, aPTT.
- Lipid profile.
- LFT.
- EKG.
- Echocardiography.
- Continuous cardiac monitoring.
- Obtain repeat head CT scan or MRI brain scan for patients with neurologic deterioration.

NOTE: If return of symptoms or clinical deterioration, CALL STROKE ALERT IMMEDIATELY.
  - Stroke Level 1
  - Stroke Level 2

Determining Hospital Admission

Observation/CDU
It is reasonable to hospitalize patients with TIA in the CDU, if they present within 72-hours of the event and meet the following criteria:
- ABCD² score of ≥ 3.
- ABCD² score of 0-2 and uncertainty that diagnostic workup can be completed within 2 days as an outpatient.
- ABCD² score of 0-2 and other evidence that indicates the patient’s event was caused by focal ischemia.

Inpatient Admission
The decision to admit is at the discretion of the Neurovascular attending. Patients who should be admitted to inpatient floors include:
- Patients with > 1 symptomatic episode in a 24-hour period.
- Patients presenting with crescendo symptoms.
- New onset atrial fibrillation with TIA symptoms.
- Patients with TIA symptoms and > 70% stenosis of a carotid artery.

Patient Care in CDU
- For Inpatient Management of TIA.
- Consult Neurovascular.

Immediate Care of the Patient
- Antihypertensive medication:
  - Withhold antihypertensive agents unless SBP > 220 mmHg or DBP > 120 mmHg.
  - When treatment is indicated, lower BP cautiously.
  - Aim for a 10-15% reduction in BP.
- Provide continuous cardiac monitoring for at least 24-48 hours after TIA to detect possible cardiac complications.
- Treat hypoglycemia (< 70 mg/dL).
  - See OSUWMC Diabetes: Hypoglycemia Treatment in Non-Pregnant Adults guideline.
- Treat hyperglycemia (> 140 mg/dL).

General Interdisciplinary Care of the Patient
- Avoid use of indwelling catheters, if possible, to reduce risk of UTI.
- Complete NIH Stroke Scale every 4 hours or as ordered.
- Provide stroke education.
- Provide tobacco cessation information.
- Initiate earlyrehabilitation.
Discharge Planning

- Follow-up to be scheduled prior to discharge with appointment made within 14 days of discharge date, at the discretion of the Neurovascular Stroke Attending.
- Involve patient’s family/caregiver in assessment of post discharge needs, decision making, and treatment planning.
- Complete at discharge:
  - Modified Rankin Scale.
  - NIH Stroke Scale.

Multidisciplinary Focus

Provide education for patient’s family/caregivers on:
- Stroke (pathology, prevention, signs/symptoms, and actions to take).
- Follow-up appointments/therapy.
- Treatment plan.

Case Manager

- Consider availability of support services and desires of the patient’s family/caregiver.
- Provide information about discharge plans and post-discharge management to primary care physicians and community services.

Associated Order Sets

- ED: CDU/OBS TIA (transient ischemic attack) [2359]

References


Quality Measures

- All Joint Commission Stroke and Comprehensive Stroke Performance Measures

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Guideline reviewed by the Stroke Quality Committee.

Guideline Approved


Disclaimer: Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC’s guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.

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### Table 1: Management of Risk Factors Associated with Stroke or TIA

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| **Hypertension**             | • The start of blood pressure medications will be at the discretion of the vascular neurologist.  
• Individualize BP targets and drug therapy.  
• If appropriate, consider:  
  o Benefit has been associated with average reduction of 10/5 mmHg.  
  o Normal BP levels have been defined as:  
    - ≤ 60 years of age: 140/90mmHg.  
    - > 60 years of age: < 150/90mmHg |
| **Diabetes**                 | • Hemoglobin A1c goal no higher than 7%.  
• Glucose control near-normoglycemic levels. |
| **Hypercholesterolemia**     | • High- or moderate- intensity statin therapy should be initiated on all patients regardless of LDL (in the absence of contraindications).  
Note: See ACC/AHA guideline for recommendations on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk. |
| **Tobacco**                  | • Advise patients who have smoked in the last year to discontinue cigarette smoking.  
• Consider tobacco cessation information. |
| **Alcohol Consumption**      | • Advise heavy drinkers to eliminate or reduce consumption of alcohol.  
• Light to moderate levels of no ≤ 2 drinks for men and ≤ 1 drink per day for non-pregnant women acceptable. |
| **Obesity**                  | • BMI goal of 18.5 to 24.9 kg/m².  
• Waist circumference of < 35 in. for women and < 40 in. for men. |
| **Physical Activity**        | • Advise at least 30 min. of moderate-intensity physical activity most days.  
• Advise supervised therapeutic exercise regimen for those with disability after stroke. |

### Table 2: Non-cardioembolic Stroke or TIA

| Non-cardioembolic Stroke or TIA | Acceptable options for initial therapy:  
  • Aspirin and extended-release dipyridamole (Aggrenox®).  
    ▪ May be more effective than aspirin alone.  
  • Aspirin 81-325 mg daily  
  • Clopidogrel (Plavix®) 75 mg daily.  
    ▪ Consider in patients with aspirin allergy. |
**Table 3: Treatment Recommendations for Patients with Stroke Caused by Large Artery Atherosclerosis**

<table>
<thead>
<tr>
<th>Extracranial Carotid Disease</th>
<th>Carotid Endarterectomy (CEA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Recommended for patients with recent TIA or ischemic stroke within the last 6 months and severe stenosis (70% to 99%) and perioperative morbidity and mortality of &lt; 6%.</td>
</tr>
<tr>
<td></td>
<td>• Consider for moderate stenosis (50% to 69%), depending on risk factors and symptoms; not recommended for &lt; 50% stenosis.</td>
</tr>
<tr>
<td></td>
<td>• When CEA is indicated, surgery within 2 weeks of TIA or stroke is suggested rather than delaying surgery.</td>
</tr>
<tr>
<td></td>
<td>• Measure carotid stenosis using North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria.</td>
</tr>
<tr>
<td></td>
<td>Carotid Artery Balloon Angioplasty and Stenting (CAS)</td>
</tr>
<tr>
<td></td>
<td>• Consider in patients with severe stenosis, and CEA contraindicated and peri-procedural morbidity and mortality 4-6%.</td>
</tr>
<tr>
<td></td>
<td>Extracranial-Intracranial (EC/IC) Bypass Surgery</td>
</tr>
<tr>
<td></td>
<td>• Not recommended.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Intracranial Arterial Disease</th>
<th>Endovascular Treatment</th>
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<tbody>
<tr>
<td></td>
<td>• Recommendation limited to lesion refractory to medical therapy.</td>
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</table>

<table>
<thead>
<tr>
<th>Extracranial Vertebrobasilar Disease</th>
<th>Endovascular Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Consider endovascular treatment when symptoms persist despite medical therapies.</td>
</tr>
</tbody>
</table>

**Table 4: Treatment Recommendations for Patients with Cardioembolic Stroke**

*Note: TIA or ischemic stroke patients with cardiac disease are generally treated with anticoagulant drugs.*

<table>
<thead>
<tr>
<th>Atrial Fibrillation</th>
<th>The start of anticoagulation medications will be at the discretion of the vascular neurologist.</th>
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<tbody>
<tr>
<td></td>
<td>Alternatives to warfarin in patients with nonvalvular AFib include:</td>
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<tr>
<td></td>
<td>• Dabigatran (Pradaxa®)*150mg Q12H</td>
</tr>
<tr>
<td></td>
<td>• Rivaroxaban (Xarelto®)*20mg Q24H</td>
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<tr>
<td></td>
<td>• Apixaban (Eliquis®)*5mg Q12H</td>
</tr>
<tr>
<td></td>
<td>• Edoxaban (Lixiana®)*60mg Q24H</td>
</tr>
<tr>
<td></td>
<td>• Not part of OSUW MC Formulary.</td>
</tr>
<tr>
<td></td>
<td>Warfarin.</td>
</tr>
<tr>
<td></td>
<td>• Target INR: 2.5 (range 2-3)</td>
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<tr>
<td></td>
<td>• Aspirin 325 mg/day if unable to take oral anticoagulants.</td>
</tr>
<tr>
<td>Acute MI and Left Ventricular Thrombus</td>
<td>Oral anticoagulation (target INR 2-3) for 3-12 months and enteric-coated aspirin up to 162 mg/day.</td>
</tr>
<tr>
<td>Dilated Cardiomyopathy</td>
<td>Warfarin (target INR: 2-3) or antiplatelet therapy.</td>
</tr>
<tr>
<td>Valvular Heart Disease</td>
<td>Rheumatic Mitral Valve Disease</td>
</tr>
<tr>
<td></td>
<td>• Warfarin.</td>
</tr>
<tr>
<td></td>
<td>• Target INR: 2.5 (range 2-3).</td>
</tr>
<tr>
<td></td>
<td>• Add aspirin 81 mg per day if recurrent embolism on warfarin.</td>
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<tr>
<td></td>
<td>Mitral Valve Prolapse (MVP)</td>
</tr>
<tr>
<td></td>
<td>• Long-term antiplatelet therapy.</td>
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<tr>
<td></td>
<td>Mitral Annular Calcification (MAC)</td>
</tr>
<tr>
<td></td>
<td>• Antiplatelet or warfarin therapy may be considered for mitral regurgitation resulting with MAC without atrial fibrillation.</td>
</tr>
<tr>
<td></td>
<td>Aortic Valve Disease</td>
</tr>
<tr>
<td></td>
<td>• Antiplatelet therapy without atrial fibrillation.</td>
</tr>
<tr>
<td></td>
<td>Prosthetic Heart Valves</td>
</tr>
<tr>
<td></td>
<td>• See Anticoagulation Recommendations Post-Valve Replacement.</td>
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</tbody>
</table>