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)) from patient and/or family
- ABCD² Score for TIA

Making the Diagnosis

Emergency Department
- If symptoms have resolved – consult Neurology for TIA evaluation
- Call Stroke Level 1 only if symptoms are present and LKW < 8 hours
- Call Stroke Level 2 for symptom onset between 8-12 hours from LKW
- Refer to NIH Stroke Scale. Document in all patients.

Inpatient
- Consult Stroke Team.

Confirming the Diagnosis

TIA Evaluation – For All Patients
- Head CT- initial evaluation
- Magnetic resonance brain scan without contrast
- Glucose, Hg A1c
- CBC with platelet count
- Electrolytes, BUN, creatinine
- PT / INR, aPTT
- Lipid profile
- EKG
- MRA or CTA of brain and neck
- Carotid Doppler if MRA and CTA are not possible
- Echocardiography
- Continuous cardiac monitoring
- Obtain repeat head CT scan or magnetic resonance brain scan for patients with neurologic deterioration
- If return of symptoms or clinical deterioration immediately Call Stroke Alert

Determining Hospital Admission
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

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

Note: Admissions at the discretion of the Neurovascular attending

Patient Care in CDU
- For Inpatient Management of TIA
- Consult Stroke Team

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)
- 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 early rehabilitation

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 Modified Rankin Scale at discharge.
- Complete NIH Stroke Scale at discharge.

Multidisciplinary Focus
- Provide education for patient’s family/caregivers about stroke (pathology, prevention, signs/symptoms, and actions to take), follow-up
appointments/therapy, treatment plan, and how to access community resources.

**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**

- OSU IP ED: CDU/OBS TIA (transient ischemic attack) [2359]
- OSU IP ED: Ischemic Stroke – Confirmed no TPA [2993]
- OSU IP ED: Ischemic Stroke – Confirmed (TPA) [2931]
- OSU IP ED: Stroke Alert [2265]
- OSU IP NV1: Admission Stroke – no TPA [2240]
- OSU IP NV1: Admission Stroke – with TPA [2148]
- OSU IP NV1: Stroke Bundle [2473]

**References**


**Inpatient Quality Measures**

- Venous thromboembolism (VTE) prophylaxis
- Discharged on antithrombotic therapy
- Anticoagulation therapy for atrial fibrillation/flutter
- Antithrombotic therapy by end of hospital day 2
- Dysphagia screening
- Stroke education
- Tobacco cessation information
- Assessed for rehabilitation

**Guideline Authors**

- Noah Grose, RN, BSN, ACNP-BC
- Reza Behrouz, DO
- Andrew King, MD
- Ciaran Powers, MD, PhD
- Jennifer Severing, PharmD
- Michelle Graf, PT
- Anne Utz, RN

**Guideline Approved**

April 23, 2014. First Edition

**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.

Copyright © 2014, The Ohio State University Wexner Medical Center. No part of this publication may be reproduced in any form without permission in writing from The Ohio State University Wexner Medical Center.
### Table 1: Management of risk factors associated with Stroke or TIA

| Hypertension | 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  
| | o Drug regimen of diuretics or the combination of diuretics and an ACEI.  
| 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).  
| | See ACC/AHA Guideline  
| 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 more than 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: Noncardioembolic Stroke or TIA

| Noncardioembolic Stroke or TIA | Acceptable options for initial therapy:  
| | o Aspirin and extended-release dipyridamole (Aggrenox®).  
| | ▪ May be more effective than aspirin alone.  
| | o Aspirin 81-325 mg daily  
| | o Clopidogrel (Plavix®) 75 mg daily.  
| | ▪ Consider in patients with aspirin allergy.  
| | o Combination aspirin and clopidogrel (Plavix®) is not recommended.  

### Table 3: Treatment recommendations for Patients with Stoke Caused by Large Artery Atherosclerosis

| Extracranial Carotid Disease | **Carotid Endarterectomy (CEA)**  
|-------------------------------|--------------------------------------------------|
|                               | • 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 < 6%.  
|                               | • Consider for moderate stenosis (50% to 69%), depending on risk factors and symptoms; not recommended for < 50% stenosis.  
|                               | • When CEA is indicated, surgery within 2 weeks of TIA or stroke is suggested rather than delaying surgery.  
|                               | • Measure carotid stenosis using North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria.  
|                               | • **Carotid Artery Balloon Angioplasty and Stenting (CAS)**  
|                               | • Consider in patients with severe stenosis, and CEA contraindicated and peri-procedural morbidity and mortality 4-6%.  
|                               | • **Extracranial-Intracranial (EC/IC) Bypass Surgery**  
|                               | • Not routinely recommended.  

| Intracranial Arterial Disease | **Endovascular Treatment**  
|-------------------------------|--------------------------------------------------|
|                               | • Recommendation limited to lesion refractory to medical therapy.  

| Extracranial Vertebrobasilar Disease | **Endovascular Treatment**  
|---------------------------------------|--------------------------------------------------|
|                                       | • Consider endovascular treatment when symptoms persist despite medical therapies.  

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

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

| Atrial Fibrillation | **Warfarin** (target INR 2.5; range 2-3)  
|---------------------|--------------------------------------------------|
|                     | • Dabigatran (Pradaxa®)150 mg bid, Rivaroxaban (Xarelto®) 20mg daily, and Apixiban (Eliquis®) 5mg bid are alternatives to warfarin in patients with nonvalvular AFib.  
|                     | ▪ **Dosing may require adjustment for renal dysfunction.**  
|                     | • Aspirin 325 mg/day if unable to take oral anticoagulants.  

| Acute MI and Left Ventricular Thrombus | **Oral anticoagulation** (target INR 2-3) for 3-12 months and enteric-coated aspirin up to 162 mg/day.  

| Dilated Cardiomyopathy | **Warfarin** (target INR 2-3) or antiplatelet therapy.  

| Valvular Heart Disease | **Rheumatic Mitral Valve Disease**  
|------------------------|--------------------------------------------------|
|                        | • Warfarin (target INR 2.5; range 2-3) add aspirin 81 mg per day if recurrent embolism on warfarin.  

|                        | **Mitral Valve Prolapse (MVP)**  
|                        | • Long-term antiplatelet therapy.  

|                        | **Mitral Annular Calcification (MAC)**  
|                        | • Antiplatelet therapy (antiplatelet or warfarin therapy may be considered if mitral regurgitation resulting with MAC without atrial fibrillation).  

|                        | **Aortic valve disease**  
|                        | • Antiplatelet therapy without atrial fibrillation.  

|                        | **Prosthetic Heart Valves**  
|                        | • See Anticoagulation Recommendations Post-Valve Replacement.