

Just the Facts: Diagnosis and risk-stratification following transient ischemic attack

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CLINICAL SCENARIO

A 67-year-old male presents to the emergency department (ED) with a 10-minute history of right upper extremity and right facial weakness, which came on suddenly. His symptoms spontaneously remitted. He has never experienced symptoms like this before. He has a past medical history of coronary artery disease, type 2 diabetes mellitus, dyslipidemia, and is a lifelong smoker. The patient states that he now feels completely well and back to his baseline. On examination, the patient is afebrile. Blood pressure is 160/87, heart rate is 89 in sinus rhythm, and respiratory rate is 16. His oxygen saturation on room air is 94%. Glucose is 5.6 mmol/L. Cranial nerve and peripheral neurological examination are completely unremarkable. Reflexes, coordination, and gait are all within normal limits. Cardiac and respiratory examination are also unremarkable. His electrocardiogram shows normal sinus rhythm.

1. Why is diagnosis of transient ischemic attack (TIA) important? Answer: Diagnosis of TIA is an opportunity to prevent a subsequent stroke.

A TIA is defined as a transient episode of neurological dysfunction caused by focal brain or retinal ischemia, referable to arterial distributions, and without acute infarction.¹ Patient symptoms resolve spontaneously. Historically, TIA was based on symptoms lasting <24 hours, yet newer definitions rely on normal neuroimaging independent of symptom duration. Practically speaking, patients with TIA or nondisabling stroke are essentially two points on a spectrum of cerebral ischemia, and both benefit from intensive secondary prevention. The risk of subsequent stroke after a treated TIA has decreased to <5% within 7 days and <8% within 90 days.² Close and immediate stroke neurology follow-up has been shown to reduce the subsequent stroke rate to 1.2% within 90 days.³

2. What workup should ED patients with suspected TIA undergo? Answer: Electrocardiogram, brain imaging, and noninvasive vascular imaging.

The Canadian Stroke Best Practice Recommendations (CSBPR) suggest patients with suspected TIA undergo specific investigations, including brain imaging (such as computed tomography), imaging of the neck and cerebral vasculature, and electrocardiogram.⁴ Investigational approach will necessarily be guided by the resources available at any given ED. If these tests are not immediately available in the ED, they should be organized as soon as possible.

3. Are there particular TIA patients at heightened risk of future stroke? Answer: Patients with unilateral weakness or speech disturbance are at highest risk.

TIA patients with weakness or speech disturbances are at high-risk for subsequent stroke, and should be assessed immediately in an ED with advanced stroke capabilities. These patients require urgent brain and vascular imaging

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of the neck and brain. The CSBPR defines any patient with motor, speech, or symptoms suggestive of posterior circulation stroke (such as binocular diplopia) within 48 hours of onset as highest risk.⁴

4. Is treatment indicated in patients with TIA? Answer: Intervention is based upon the presumed etiology of the symptoms.

For TIA patients with significant, ipsilateral carotid artery stenosis (i.e., $\geq 50\%$), carotid endarterectomy should be considered. Regarding antiplatelet agents, all patients should be given a loading dose (e.g., acetylsalicylic acid [ASA] 160 mg or clopidogrel 300 mg) upfront, and then prescribed daily therapy for subsequent stroke prevention. However, cardioembolic etiologies (e.g., atrial fibrillation) without an acute brain infarct should receive anticoagulation. Start patients on a direct oral anticoagulant (DOAC), unless contraindicated. Patients already on warfarin can be left on this treatment (e.g., mechanical heart valves). Patients for whom anticoagulation is contraindicated should be on ASA. For patients with an acute embolic ischemic stroke or TIA of undetermined source, electrocardiograph (ECG) monitoring at least 24 hours is recommended as part of the initial stroke work-up to detect paroxysmal atrial fibrillation. If an acute embolic ischemic stroke or TIA remains suspected clinically, yet there is no determined source after initial monitoring, prolonged ECG monitoring for at least 2 weeks is recommended.⁴

5. Should dual antiplatelet therapy be initiated in patients with TIA? Answer: In particular patient populations, benefit from dual antiplatelet therapy has been demonstrated.

In high-risk TIA patients, dual antiplatelet therapy with clopidogrel and ASA has been shown to be beneficial in decreasing secondary major vascular events, although this comes with a higher risk of major hemorrhage.⁵ The optimal duration of therapy is likely 21 days.

6. What recommendations can be provided to patients to reduce the risk of future stroke? Answer: Risk-factor management reduces the risk of recurrent stroke.

Counseling patients on the contribution of particular lifestyle interventions can mitigate the risk of stroke following TIA. Diets low in cholesterol (<200 mg daily) and sodium (<2000 mg daily) are encouraged. Patients are asked to participate in moderate exercise 4- to 7-days per week. Smoking cessation significantly reduces future stroke risk.⁴

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REFERENCES

1. Easton JD, Saver JL, Albers GW, et al. Definition and evaluation of transient ischemic attack: a scientific statement for healthcare professionals from the American Heart Association/American Stroke Association Stroke Council; Council on Cardiovascular Surgery and Anesthesia; Council on Cardiovascular Radiology and Intervention; Council on Cardiovascular Nursing; and the Interdisciplinary Council on Peripheral Vascular Disease. The American Academy of Neurology affirms the value of this statement as an educational tool for neurologists. *Stroke* 2009;40:2276–93.
2. Perry JJ, Sharma M, Sivilotti ML, et al. A prospective cohort study of patients with transient ischemic attack to identify high-risk clinical characteristics. *Stroke* 2014;45:92–100.
3. Lavalley PC, Meseguer E, Abboud H, et al. A transient ischaemic attack clinic with round-the-clock access (SOS-TIA): feasibility and effects. *Lancet Neurol* 2007;6:953–60.
4. Canadian Stroke Best Practices - Secondary Prevention of Stroke [<https://www.strokebestpractices.ca/recommendations/secondary-prevention-of-stroke/initial-risk-stratification-and-management-of-nondisabling-stroke-and-tia>] (accessed November 19, 2019).
5. Johnston SC, Easton JD, Farrant M, et al. Clopidogrel and aspirin in acute ischemic stroke and high-risk TIA. *N Engl J Med* 2018;379:215–25.