

Care of Neurologic Conditions in an Observation Unit



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KEYWORDS

- Emergency department • Neurologic conditions • Cerebrovascular disease
- Headache • Observation unit

KEY POINTS

- ED Observation Units are the ideal setting for continued monitoring, and diagnostic testing for patients presenting to the ED with neurologic complaints.
- A transient ischemic attack (TIA) is a sentinel event for stroke. Patients with TIA should be risk stratified and begin risk lowering therapies.
- Similarly, the EDOU can be used for further risk stratification of patients with non-disabling cerebrovascular accidents (CVA).
- The EDOU is appropriate for patients with other neurologic conditions such as headache, seizures and vertigo. Goals can include neuro checks, imaging or specialist consultation.

Case Study

Carol Brown is a 58-year-old woman who presents to the emergency department with pronounced weakness for 12 minutes that resolved 1 hour before arrival. She has a history of hypertension and hyperlipidemia, but no prior stroke or transient ischemic attack. Her examination is normal, including a National Institutes of Health Stroke Score of zero. In the emergency department her cardiac monitor shows a sinus rhythm, and her noncontrast head computed tomography scan and blood work is normal. Her ABCD² score is 3. In the observation unit, her serial examinations and cardiac monitoring are normal, her echocardiogram and MRI of the brain are normal; however, her magnetic resonance angiogram of the neck vessels shows greater than 70% carotid stenosis. She was admitted to the hospital and underwent successful endarterectomy 5 days later following preoperative clearance. On 1-month follow-up she was asymptomatic and doing well.

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INTRODUCTION

As a group, neurologic conditions represent a substantial portion of emergency department (ED) visits. In 2011, 4.7% of ED visits were for diseases of the nervous system.¹ Cerebrovascular disease was the fifth leading principal hospital discharge diagnosis for admitted ED patients.¹ Between 2001 and 2011 the percentage of patients receiving neuro imaging in the ED increased 39% (from 66% to 92%).² Similarly, headache (HA) is the fourth leading principal reason for an ED visit overall, accounting for 4.3 million visits or 3.2% of all visits.

TRANSIENT ISCHEMIC ATTACK

Background

In the United States, stroke is the fifth leading cause of death.³ With roughly 800,000 strokes occurring annually, stroke is also a leading cause of disability, costing the United States roughly \$34 billion per year.⁴ Eighty-five percent of strokes are ischemic, and between 15% and 30% of ischemic strokes are preceded by a transient ischemic attack (TIA).^{5,6} An estimated 240,000 TIAs occur annually. TIA has been redefined by the American Stroke Association (ASA) as a “(t)ransient episode of neurologic dysfunction caused by focal brain, spinal cord, or retinal ischemia without acute infarction.”⁷ Notable updates in this definition include the addition of “infarction” found on brain imaging and the removal of time elements such as 24 hours or 1 hour. Symptoms lasting more than 1 hour have a less than 1 of 6 chance of not having a stroke.⁷ Patients with clinical resolution of stroke symptoms that show brain infarction on computed tomography (CT) imaging have a fourfold higher risk of subsequent stroke, and those with a new infarct on MRI have a fivefold higher incidence of subsequent stroke.^{8–10}

Although patients with TIA present with no residual deficits, they are at significant risk of subsequent vascular events. Overall, their approximate 90-day stroke rate is 12%, with half of these strokes occurring within the first 1 to 2 days after a sentinel TIA.^{7,11,12} In fact, this 90-day stroke rate is more than twice that of patients who have suffered an actual stroke (4%), suggesting that patients with TIA present in a state of greater vascular vulnerability. Yet this is confounded by the fact that these patients appear clinically normal, and most will not have an adverse event during or shortly after their TIA, making TIA an ideal condition for an ED observation unit (EDOU).

Emergency Department Management

The initial ED evaluation and subsequent ED management of patients with TIA is focused on the early detection and prevention of stroke, the detection of alternate causes of TIA symptoms, and the prevention of future strokes. This includes a history that includes symptom duration, vascular risk factors, and other potential etiologies. Ideally, the examination should include a structured stroke examination, such as the National Institutes of Health Stroke Score (NIHSS), to improve the clinical detection of small or subtle strokes. Obtaining an electrocardiogram and placing the patient on cardiac monitoring is important for the detection of atrial fibrillation. Blood testing should include a complete blood count, serum glucose, and electrolytes. A prothrombin time is often ordered, as well, in the event that the patient subsequently develops stroke requiring reperfusion therapy. Brain imaging, with either CT or MRI, should be obtained if possible. Although the safety of delaying imaging is unknown, there are several benefits to timely imaging.¹³

The transient ischemia that occurs in patients with TIA may be due to a number of different vascular events (**Table 1**). Causes of TIA may be broadly classified as intracranial vascular, extracranial vascular, and cardioembolic. When an etiology is not

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