

Diagnosis of Acute Ischemic Stroke



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KEYWORDS

- Community detection • Prehospital diagnosis • ED evaluation • Stroke scales
- Brain imaging

KEY POINTS

- Public education and awareness of the signs and symptoms of acute ischemic stroke (AIS), via education campaigns such as the FAST mnemonic or the “suddens” message, is an essential first step in making a timely diagnosis in patients suffering an AIS.
- In their determination of whether a patient is suffering an AIS, emergency medical service providers should use focused tools, such as the Cincinnati Prehospital Stroke Scale or the Los Angeles Prehospital Stroke Screen. Prehospital scales to further evaluate for stroke severity are currently being developed and studied.
- The diagnosis of AIS is made using a combination of patient history, clinical examination, and brain imaging.
- Time of symptom onset, or time that the patient was last symptom-free, is the most important piece of historical data obtained in the evaluation of a patient with suspected AIS.
- The primary goal of brain imaging in the evaluation of a patient with suspected AIS is to exclude intracranial hemorrhage. The benefit of treatment with endovascular therapy in selected patients has expanded the role of imaging to also evaluate for the presence of an intravascular thrombus, the size of irreversible infarcted tissue, and potentially the amount of hypoperfused tissue at risk for infarction.

INTRODUCTION

Acute ischemic stroke (AIS) is defined as an episode of neurologic dysfunction caused by focal cerebral, spinal, or retinal cell death attributable to ischemia, based on (1) pathologic, imaging or other objective evidence of cerebral, spinal cord, or retinal focal ischemic injury in a defined vascular distribution; or (2) clinical evidence of cerebral, spinal cord, or retinal focal ischemic injury based on symptoms persisting 24 or more hours or until death, and other causes excluded.¹ (Fig. 1).

Approximately 795,000 people per year suffer from a new or recurrent stroke, and 87% of all strokes are due to acute brain ischemia. Stroke is the leading cause of

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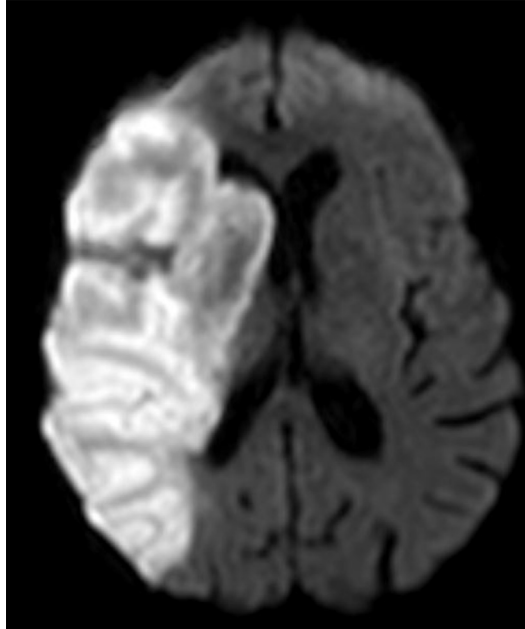


Fig. 1. Large right middle cerebral artery territory AIS on diffusion-weighted imaging.

long-term disability and the fourth leading cause of death in the United States.² Treatment of patients suffering an AIS is time-dependent and early treatment is associated with reduced morbidity and mortality.³ Rapid detection and diagnosis of patients suffering an AIS is paramount to improving outcomes in these patients. (See Matthew S. Siket's article, "[Treatment of Acute Ischemic Stroke](#)," in this issue.) This article focuses on the rapid and accurate diagnosis of patients suffering an AIS, starting with initial detection in the community, leading to the prehospital evaluation, and finally resulting in a rapid work-up by the acute stroke team in the emergency department (ED).

Community Awareness and Education

The first link in the stroke chain of recovery is detection, or the rapid recognition and identification of stroke symptoms by the patient or bystanders.⁴ Unfortunately, public knowledge of symptoms of AIS is poor.⁵⁻⁷ In a meta-analysis evaluating the delay in care in patients suffering an AIS, 21 of the 54 studies identified lack of recognition of symptoms of AIS or delay in seeking care if symptoms were recognized by patients and their families as the primary limitation in obtaining timely and urgent care. **Box 1** lists the most common factors associated with this early delay in care by patients and their family members.⁸

To improve access to treatment and, thereby, have better outcomes in patients suffering an AIS, community education on the symptoms of AIS and community-wide coordination of stroke care is paramount. Ideally, patients, family members, bystanders, and the general public should recognize the signs and symptoms of a potential AIS and understand the urgent need to seek treatment. In particular, patients at high risk for AIS and groups of patients that are more likely to delay seeking medical attention, as well as family members, coworkers, and caregivers of these patients, should be the target of community education interventions.⁹

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