



# Implantable Loop Recorders for Cryptogenic Stroke (Plus Real-World Atrial Fibrillation Detection Rate with Implantable Loop Recorders)

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## KEYWORDS

• Cryptogenic stroke • Implantable loop recorder • Atrial fibrillation

## KEY POINTS

- Cryptogenic stroke (CS) represents a significant percentage of ischemic strokes and is associated with significant morbidity and high risk of recurrence.
- Undetected atrial fibrillation (AF) is an important consideration in these patients.
- Tools for electrocardiographic monitoring range from the 12-lead electrocardiogram (ECG) to implantable loop recorders (ILRs).
- Given the mantra, “the more you look, the more you shall find,” ILRs have become an important tool for long-term ECG monitoring in patients with CS.
- A major unresolved issue is what duration of AF indicates that the CS patient is at high risk for recurrent stroke and thus would benefit from initiation of anticoagulation.

A stroke occurs in approximately 800,000 people each year in the United States; it can be a devastating diagnosis, associated with high morbidity and mortality, and results in a significant impact on society and the health care system.<sup>1,2</sup> The standard evaluation of a patient presenting with stroke includes a comprehensive physical examination (with emphasis on the blood pressure and heart rate, pattern and location of neurologic deficit, and physical signs of hyperlipidemia or vasculitis), basic hematologic tests, assessment of the cardiac rhythm (electrocardiography [ECG] and inpatient telemetry), and cardiac (transthoracic and transesophageal echocardiography) and neurologic (head computed tomography, head MRI

and magnetic resonance angiography, and carotid ultrasound) imaging. Additional tests can also be performed as clinically indicated (**Fig. 1**). Despite these efforts, a definitive cause for stroke cannot be identified in 10% to 40% of patients<sup>1,3,4</sup>; these patients are considered to have suffered a cryptogenic stroke (CS).

Approximately a third of patients with CS suffer another event within 10 years; thus, it is critical to identify a definite cause and initiate treatment accordingly.<sup>3,5</sup> A strong consideration in these patients is cardioembolism, either because of a paradoxical embolism or from within the left atrial appendage, left ventricle, or aorta. There has been great interest in the association between

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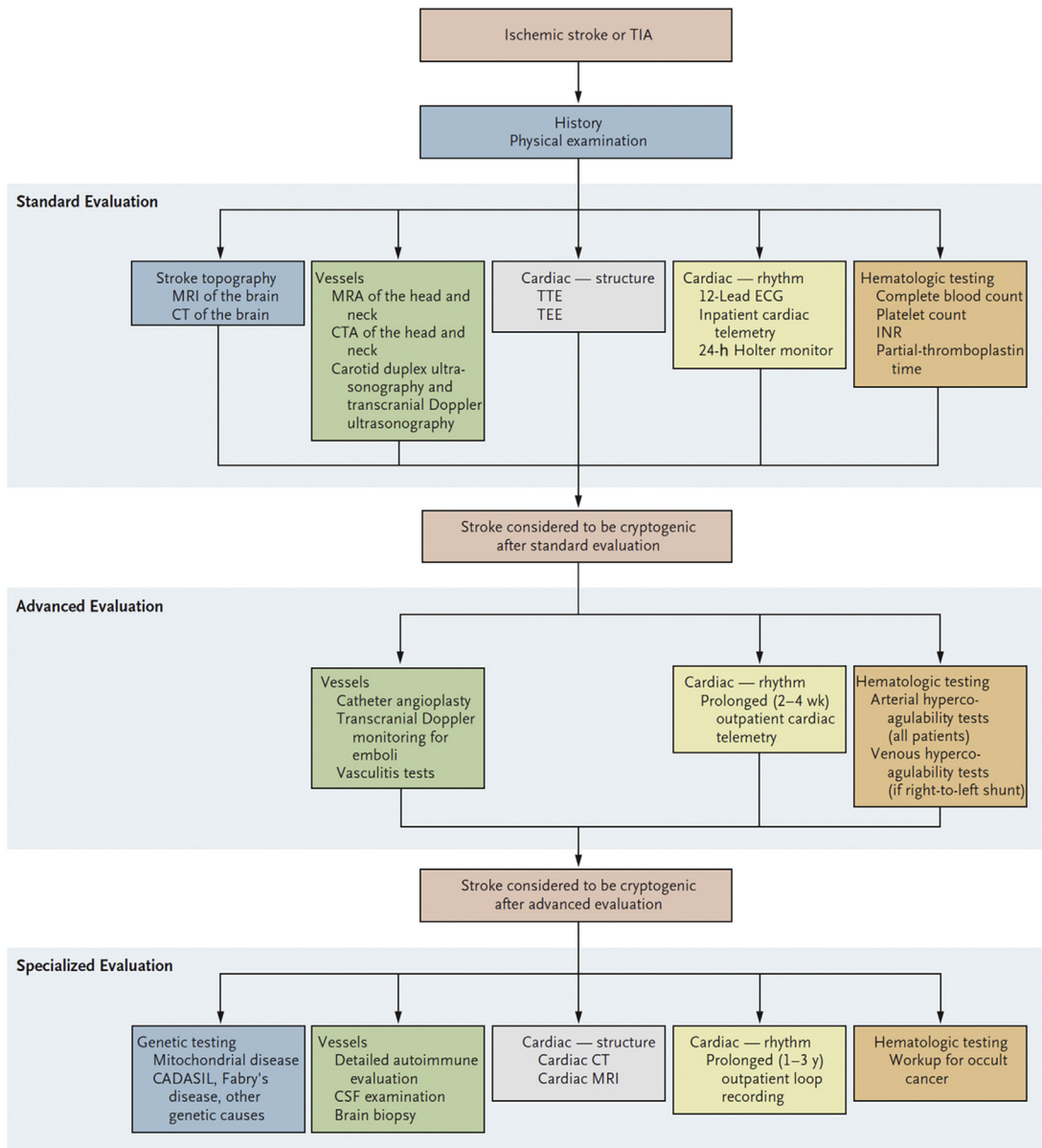
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**Fig. 1.** Algorithm for the identification and diagnostic evaluation of patients with cryptogenic ischemic stroke or transient ischemic attack (TIA). CADASIL, cerebral autosomal-dominant arteriopathy with subcortical infarcts and leukoencephalopathy; CSF, cerebrospinal fluid; CT, computed tomography; CTA, computed tomographic angiography; INR, international normalized ratio; MRA, magnetic resonance angiography; TEE, transesophageal echocardiography; TTE, transthoracic echocardiography. (Reproduced from Saver JL. Clinical practice. Cryptogenic stroke. *N Engl J Med* 2016;374(21):2068; with permission.)

the presence of a patent foramen ovale and CS and the role of patent foramen ovale closure as a strategy to mitigate against recurrent stroke. However, only one randomized trial has suggested a benefit and a recent meta-analysis showed the benefit of patent foramen ovale closure to be only marginal.<sup>6,7</sup> Similarly, empiric anticoagulation was considered a possible solution. However, in

patients with CS, empiric treatment with warfarin was not superior to aspirin alone in preventing recurrent stroke, but was associated with a significant increase in bleeding events.<sup>8</sup> For these reasons, current guidelines do not recommend empiric anticoagulation in patients with CS.

Because the benefit of anticoagulation is well established in patients with atrial fibrillation (AF),

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