"Stroke" is defined as sudden-onset nonconvulsive neurologic deficit of a cerebrovascular origin. Each year, in the United States, 350,000 people experience a first stroke, and another 100,000 have a recurrent attack. A total of 400,000 to 500,000 new strokes occur annually, and there are 3 million stroke survivors. Stroke is the #3 cause of death and the #1 cause of disability (1992 Heart and Stroke Facts. Dallas: American Heart Association, 1991:1–48). This article will review recent advances in echoplanar diffusion-weighted magnetic resonance imaging and intravenous thrombolytic therapy of acute stroke.

Strokes is a layman's term that encompasses many different etiologies for sudden neurologic deficit. These include nonhemorrhagic (80%) and hemorrhagic causes (20%) (Table 1). For nonhemorrhagic stroke (infarction), there is a new paradigm approach, with the new coined phrase "brain attack." There has been a shift in the approach to treatment of infarction akin to that for "heart attack." We are now entering an era of proactive, not reactive, stroke therapies. Thrombolytic therapy has been studied extensively for the past 8 years. Intravenous tissue plasminogen activator (t-PA) has been approved for use in patients within 3 hours of onset of an ischemic stroke.

**ACUTE STROKE PROGRAMS**

Thrombolytic therapy requires a coordinated effort to triage and streamline the delivery of health care from the recognition of the initial symptoms, emergency medical service (EMS) activation, prompt diagnosis, and infusion of thrombolytic agent. Many medical centers are implementing acute stroke...
Stroke team members typically include an emergency department physician, neurologist, stroke nurse, pharmacist, computed tomography (CT) technologist/radiologist, phlebotomist, intravenous therapist, and EMS. In many cities, EMS personnel are instructed to direct patients with sudden neurologic symptoms to acute stroke programs. The implementation of a multidisciplinary acute stroke program has been shown to decrease the length of stay and hospitalization costs of Medicare patients (1).

IMAGING

The neuroimaging approach for the radiologist until recently has been to determine the presence of hemorrhage, detect etiologies requiring emergency intervention/neurosurgery, and rule out nonischemic pathology (e.g., tumor). New additional roles include detecting acute stroke within the first few minutes, defining the area of the infarct, and determining the size of the ischemic penumbra. CT is currently the imaging modality of choice and is widely available. CT is exquisitely sensitive to acute intra-axial hemorrhage and subarachnoid hemorrhage but is incapable of reliably detecting nonhemorrhagic hyperacute stroke or the ischemic penumbra. Two of the earliest signs of acute infarction on CT are hyperdense middle cerebral artery (MCA) sign and insular ribbon sign (Fig. 1). Frequently, the initial CT is unremarkable. The CT findings in cerebral infarction are summarized in Table 2. Subacute infarction typically demonstrates mass effect (peak 3–5 days) and gyriform enhancement (Fig. 2). Chronic infarctions are near