

RSNA Statement on Stroke Imaging
Updated: 4/17/2018

The Radiological Society of North America (RSNA) is committed to excellence in patient care through education and research.

- Stroke is a leading cause of death and disability worldwide. Imaging plays a critical role in evaluating patients suspected of acute stroke and transient ischemic attack, especially prior to initiating treatment. Major advances have occurred including approval of recanalization therapies by the Food and Drug Administration (FDA).
- The primary goal of imaging patients with acute stroke symptoms is to distinguish between hemorrhagic and ischemic stroke. In ischemic stroke patients, secondary goals of imaging prior to initiating revascularization interventions with intravenous (IV) thrombolysis or endovascular therapies include identification of the location and extent of intravascular clot as well as the presence and extent of “infarct” (irreversibly damaged tissue), “ischemic penumbra” (hypoperfused tissue at risk for infarction) and/or collateral circulation.
- There is strong evidence supporting the use of IV tissue plasminogen activator (tPA) as a recanalization therapy to improve clinical outcomes during the 0-3-hour time window and during the 3-4.5-hour time window following symptom onset. This benefit is despite an increased risk of symptomatic intracranial hemorrhage after infusion.
- The timely use of imaging of the brain to exclude hemorrhage in patients with the clinical diagnosis of stroke and before initiating IV thrombolytic therapy is supported by strong evidence and is part of FDA, CMS and Joint Commission guidelines. In acute stroke patients who are candidates for IV thrombolysis (0-4.5-hour time window), either non-contrast CT or MRI of the brain is recommended to exclude intracranial hemorrhage and determine the extent of ischemic changes. Importantly, imaging in patients who are potential candidates for IV thrombolysis should not delay administration of IV thrombolysis, as “time is brain.”
- There is strong evidence coming from several positive clinical trials (MR CLEAN, ESCAPE, SWIFT-PRIME, EXTEND IA, DAWN, DEFUSE 3, etc.) supporting the use of endovascular thrombolytic devices up to 24 hours after stroke onset.
- In acute stroke patients who are candidates for endovascular therapy, vascular imaging (CTA, MRA, conventional angiography) is strongly recommended during the initial imaging evaluation. Perfusion and collateral imaging were used successfully in some of the trials listed above to select patients for reperfusion therapy.
- Early identification of the stroke etiology or mechanism (carotid atherosclerotic disease or other treatable causes) is critical to treatment decisions and long-term management. More specifically, vascular imaging of the head and neck should be performed to evaluate the mechanism of stroke and assess risk of future stroke.
- To improve patient health and safety, appropriate precautions should always be taken to minimize radiation exposure through the use of the “As Low As Reasonably Achievable (ALARA)” principle and also to minimize the time required for imaging in order not to delay treatment.

RSNA is a strong advocate for quality, safety and strict adherence to appropriateness criteria in medical imaging and radiation oncology. Through its peer-reviewed journals and education programs, RSNA continually informs radiologists, medical physicists, radiation oncologists and other radiology professionals of the latest technologies and research developments designed to optimize dose and improve patient safety.