

Evidence Discussion (HD-21)

Stroke/TIA

- Guidelines from the American Heart Association (AHA) and American Stroke Association support the role of neuroimaging in stroke triage and patient selection for endovascular therapy in the management of acute stroke.^{1,4,5} Current AHA guidelines also recommend non-invasive imaging of the carotid arteries for patients with TIA or stroke who may be candidates for carotid endarterectomy or stenting.^{1,5} This includes CT Angiography (CTA) of the head and neck or MR Angiography (MRA) of the head and neck.
- For clinically suspected stroke, initial imaging includes CT head to exclude intracranial hemorrhage, exclude other structural causes and assess for early ischemic changes.¹ CT Angiography (CTA) head is indicated during the initial evaluation to assess for large vessel occlusion and has high sensitivity of 93% and specificity of 100%.^{1,3} CTA neck is also a rapid modality for imaging the extracranial vasculature to identify carotid stenosis, occlusion and vertebral-basilar disease.¹
- CT Perfusion (CTP) can identify patients with large vessel occlusion who may be candidates for endovascular therapy in the acute stroke setting.¹
- A CT stroke protocol that includes unenhanced CT, CTA head, and CTP has effective radiation doses between 10-15 mSv, with newer generation scanners and optimized sequences with lower radiation doses closer to 2 mSv.⁵
- MRI brain with Diffusion Weighted Imaging (DWI) is the most sensitive test to detect an acute ischemic infarct, with a sensitivity of 94% and a specificity of 97%.^{1,5,6,7}
- MR Angiography (MRA) head and neck is an alternative to CTA for identification of vascular lesions in the setting of a stroke evaluation.¹ Diagnostic cervicocerebral catheter angiography has the highest spatial and temporal resolution of any vascular imaging study, however, is invasive and requires use of contrast.¹
- Compared with CT, a full stroke protocol with MRI is longer to acquire and susceptible to motion artifacts, in addition to contraindication with metallic devices, and certain implants.⁴ MRI, however, does have the advantage of increased sensitivity for acute ischemia, including in transient ischemic attack, and does not require radiation.⁴
- In the delayed stroke evaluation, CT head may identify complications such as hemorrhagic conversion, mass effect and herniation.¹ MRI brain in this scenario can confirm the extent of an ischemic stroke, evaluate for underlying pathology and identify any complications.
- For clinically suspected transient ischemic attack (TIA), CT head is useful to exclude hemorrhage and other intracranial abnormalities.¹ CT perfusion can identify abnormalities in the setting of TIA in up to one-third of cases.¹ CT Angiography (CTA) head and neck is a rapid modality for evaluating intracranial and extracranial vascular lesions.¹ MRA head and neck is an alternative modality, preferred in those with renal impairment and iodine contrast allergy.¹ MRI brain is the most sensitive modality for acute ischemic infarct.¹ MRI brain with Diffusion Weighted Imaging

(DWI) sequences can identify ischemic changes in approximately 40% of patients with TIA.⁸

- For clinically suspected venous sinus thrombosis, imaging is indicated to identify the clot and assess for complications, such as venous infarction or hemorrhagic transformation. In addition to imaging previously reviewed for the stroke protocol, CT Venogram (CTV) or MR Venogram (MRV) are appropriate to localize the clot within the venous system.¹
- For stroke or hemorrhage related to Cerebral amyloid angiopathy (CAA), Amyloid PET brain has a sensitivity that ranges from 82% to 91%, however, it's specificity is poor, ranging from 44% to 55%, therefore, this modality is not recommended.⁹

References

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