

Evidence Discussion (HD-36)

Nuclear Medicine

- Nuclear medicine studies are adjunct, functional imaging modalities in the evaluation of a variety of neurologic conditions, and are generally helpful when structural brain imaging modalities are unable to provide answers to complex clinical questions.
- The American Academy of Neurology practice guideline recommends brain SPECT to assist with prognostication in adults with traumatic brain injuries.²
- Single-photon emission CT (SPECT) is the most readily available nuclear medicine technique for assessment of cerebral hemodynamics.¹ Brain SPECT has also been validated for evaluation of cerebrovascular reactivity to acetazolamide (ACZ) challenge in patient with various types of vaso-occlusive disease, including Moyamoya disease.^{1,5}
- Brain SPECT has been used in the evaluation of stroke, TIA, monitoring of medical or surgical therapy, assessment of cerebral blood flow reserve, and estimation of prognosis.⁴ The sensitivity of brain SPECT for acute stroke localization is 85.5% with a specificity of 97.6%.⁴
- Brain SPECT used with specific perfusion agents is useful in distinguishing radiation effects from residual or recurrent tumor, and/or for distinguishing cerebral lymphoma from infection, a distinction not always possible with CT or MRI.⁴
- Dacryocystography is supported to localize the lacrimal drainage system and evaluate for suspected obstruction in the nasolacrimal duct.⁷
- Radionuclide CSF shunt studies can evaluate shunt patency, differentiate proximal versus distal obstruction, and localize the site of obstruction.⁶ The combination of CT and radionuclide is more sensitive than CT alone in diagnosing shunt malfunction.⁶
- CT head cisternography in the evaluation of CSF leak has a sensitivity range between 85%-92%.³ This modality is particularly useful when there are multiple potential CSF leak sites.³ Radionuclide cisternography is useful for confirming the presence of a CSF leak.³

References

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