

Evidence Discussion (HD-24)

Other Imaging Studies

- Functional magnetic resonance imaging (fMRI) is useful for localizing eloquent cortex in relation to a focal brain lesion, for pre-surgical planning and therapeutic follow up.¹ Overall functional MRI imaging sensitivity is 83% with a specificity of 82%, for mapping language and motor functions.⁶ Functional MRI is a useful tool for predicting post-operative outcomes in patients with a single brain tumor.⁷ Overall, fMRI studies are used in preoperative decision making in 89% of tumor patients and in 91% of epilepsy surgery patients.^{8,9} In 63% of epilepsy patients undergoing surgical evaluation, fMRI imaging results helped to avoid further studies, including the Wada test.⁹
- For cases when conventional imaging by magnetic resonance imaging or computed tomography provides limited information regarding specific clinical questions, magnetic resonance spectroscopy (MRS) provides further characterization of brain tumors, radiation treatment changes, cerebral abscess, seizure disorders, and inherited metabolic disorders.^{2,11,12} MRS has a 90% sensitivity and 86% specificity in distinguishing tumoral tissue from non-tumoral tissue.¹¹
- Pulse-gated MRI imaging or MRI CINE is performed as part of an MRI brain study and allows qualitative and quantitative analysis of oscillatory cerebrospinal fluid (CSF) movement in normal and abnormal conditions.^{5,13} This imaging technique is useful for evaluation of hydrocephalus, Chiari syndromes, Normal Pressure Hydrocephalus, intracranial hypertension, and spontaneous intracranial hypotension.^{13,14}
- MRI perfusion is useful for the diagnosis and characterization of mass lesions, surgical planning and therapeutic follow up.^{4,16} MR perfusion allows localization of tumor for higher yield on stereotactic biopsy and noninvasive differentiation between radiation necrosis from recurrent tumor when conventional MR findings are equivocal.¹⁶
- CT perfusion has multiple uses including in stroke diagnosis and treatment planning, characterization of neoplastic disease and response to treatment, and is alternative modality for those with contraindication to MRI-based perfusion imaging.^{3,15}
- The American Heart Association/American Stroke Association guidelines for acute stroke management recommend CT Perfusion for selecting candidates for mechanical thrombectomy within 24 hours after last known well.¹⁵

References

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