

# Research at a Glance

## Use of fMRI in the presurgical evaluation of patients with epilepsy

### What's known:

Neurologists assess a patient's baseline language and memory, and attempt to predict postsurgical impacts on language before the patient undergoes neurosurgical procedures to minimize the symptoms of epilepsy. In a standard intracarotid amobarbital procedure (IAP), a medication is injected through the carotid artery that isolates one hemisphere of the brain at a time followed by the patient performing memory tasks. More recently, neurologists have performed the assessment via functional magnetic resonance imaging (fMRI), an image acquisition technique that captures brain activity while the patient completes a set of memory and language tasks. Both approaches lack standardized implementation guidelines, making it difficult to fully assess when fMRI may be an effective alternative to IAP.

### What's new:

A Practice Guideline Summary published in *Neurology*, the journal of the American Academy of Neurology, establishes recommendations related to the diagnostic accuracy of fMRI for pre-surgical evaluation. An 11-member panel of international experts, including William D. Gaillard, M.D., Chief of Child Neurology, Epilepsy and Neurophysiology, and Director of the Comprehensive Pediatric Epilepsy Program at Children's National Health System, evaluated available evidence to determine when and if fMRI can reliably measure the extent that each brain hemisphere controls language, known as language lateralization, and as a predictor of postsurgical outcomes. For 20 years, Dr. Gaillard's team has led the field in the application of fMRI for language and memory assessment in children, and their work comprised a large portion of the pediatric-focused research assessed by the panel. The analyses found that fMRI is a viable option for measuring lateralized language functions in place of IAP in medial temporal lobe epilepsy, temporal epilepsy in general or extratemporal epilepsy. The assessment also identified that pre-surgical fMRI can serve as an adequate alternative to IAP memory testing for predicting verbal memory outcome. The authors recommend that clinicians carefully advise patients of the risks and benefits before recommending either approach.

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### Questions for future research:

**Q:** What is role of fMRI for pediatric epilepsy?

**Q:** Can a standard set of tasks be established as the guideline for assessment?