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63 A Literature Review of Cortical Mapping, fMRI, and Standards of Care in Pediatric Epilepsy Surgical Workup

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Objective: Epilepsy includes recurrent, unprovoked seizures and affects 470,000 children in the US, of which 7% have drug-resistant epilepsy due to failing two or more antiseizure medication trials. For some patients with drug-resistant epilepsy, surgery has been successful in reducing seizure burden. Functional MRI (fMRI) and intracranial mapping of neurocognitive functions, especially language, are increasingly done to assess potential functional loss from epilepsy surgery. However, these procedures vary by medical institute. The purpose of this review was to examine published literature on fMRI and intracranial mapping procedures for pediatric epilepsy surgery workup toward development of a standardized protocol that can be used across institutes as a guide to standard-of-care best practices for predicting loss of function associated with epilepsy surgery.

Participants and Methods: Our literature review includes information from 8 electronic databases for peer-reviewed, English language studies of evaluation for pediatric epilepsy surgery candidacy. Thirty-one studies were selected based on inclusion criteria. Only studies including fMRI and intracranial mapping conducted with pediatric patients being worked up for epilepsy surgery were selected.

Results: Our review revealed that the most common task used in fMRI and intracranial mapping procedures is visual-object naming, but type of naming tasks and the way they are administered varies widely across medical institutes and includes published measures and those created on site. Variability makes

examining findings across studies and designing best practice for these procedures challenging.
Conclusions: Creating gold-standard procedures for fMRI and intracranial mapping administration for epilepsy surgery evaluations is critical in optimizing treatment and functional outcomes for our pediatric patients. Our review is an initial step in this process.

Categories: Neurophysiology/EEG/ERP/fMRI

Keyword 1: epilepsy / seizure disorders

Keyword 2: neuroimaging: functional

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64 Effects of Age and Task Difficulty on the Presence of EEG Midline-Frontal Theta Power During Administration of the Repeatable Battery for the Assessment of Neuropsychological Status-Update (RBANS)

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Objective: Concurrent electroencephalography (EEG) during neuropsychological assessment offers a promising method to understand real-time neural and cognitive processes during task performance. For example, previous studies using experimental tasks suggest that midline-frontal theta power (MFT) could serve as a measure of mental exertion and subjective difficulty. The RBANS provides an opportunity to examine this issue in neuropsychological assessment, as a widely-used screening battery that was explicitly developed with subtests that vary according to difficulty within its five domains. This study investigated the effects of task difficulty, cognitive domain, and age on elicitation of MFT during rest and RBANS administration.

Participants and Methods: EEG was recorded during eyes-closed and eyes-open resting periods and RBANS administration in a sample of 45 healthy younger adults (n = 21; mean age = 23.29, SD = 3.27, range = 19-33; 48% female) and older adults (n = 24; mean age = 70.58, SD = 5.77, range = 59-83; 83% female). MFT was defined as the highest peak above the overall