

**Objective:** Little research exists characterizing the neuropsychological profile of pediatric insular epilepsy. Accurate diagnosis of insular epilepsy is challenging due to difficulties localizing deep brain structures with current non-invasive neurodiagnostic tools, as well as seizure semiology that may mimic temporal, frontal, and parietal seizures for this patient population [1]. Therefore, we investigated trends across neuropsychological data to help characterize the cognitive profile of pediatric insular epilepsy. This is important because studies that could accurately characterize insular epilepsy into cognitive phenotypes could potentially provide supporting evidence for insular localization during epilepsy surgery work-up. The insula is situated underneath the temporal, parietal, and frontal opercula, and has a number of diffuse projections to key brain structures involved in language, executive functioning, motor coordination, and sensory function [2]. Therefore, we hypothesized that children with insular epilepsy will demonstrate particular weaknesses in language and executive functioning skills.

**Participants and Methods:** Retrospective medical records review identified 19 children with insular epilepsy who completed neuropsychological assessment (Age:  $M=8.2$  years,  $SD=3.4$ ) at Boston Children's Hospital. Insular epilepsy was defined by ictal insular localization on long-term monitoring EEG. The current sample includes 59% males and 41% females. The majority of participants (69%) had left sided lateralization and more than one seizure type (63%). MRI findings were widely distributed across frontal, temporal, and multiple lobes as well as insular and perisylvian brain regions. A lesion was identified on MRI findings for most participants (63%).

**Results:** Descriptive analyses showed that overall IQ (FSIQ:  $M=84$ ,  $SD=12$ , range=68-102) fell in the Low Average range. Verbal and visual reasoning skills were equally developed in the Low Average range (VIQ:  $M=88$ ,  $SD=12$ , range=70-104; PIQ:  $M=88$ ,  $SD=16$ , range=53-117). Participants exhibited lower performance on speeded expressive language measures, including measures of phonemic fluency ( $M=5.5$ ,  $SD=1.5$ , range=2-8) and semantic fluency ( $M=6.7$ ,  $SD=2.5$ , range=3-11). With regard to executive functioning, reduced cognitive flexibility was observed on D-KEFS Trail Making Test (Trial 4, Number-Letter Switching:  $M=5.9$ ,  $SD=4.9$ , range=1-12). Additionally, working

memory skills fell in the Below Average range (WMIQ:  $M=77$ ,  $SD=8.5$ , range=67-88).

**Conclusions:** Our results indicate that pediatric patients with insular epilepsy present with reduced scores across aspects of speeded expressive language and executive functioning, including working memory and cognitive flexibility. Additional research is needed to replicate these preliminary findings with a larger sample size and determine whether these trends in cognitive profile would help with seizure localization. Future research should investigate whether insular epilepsy has a clearly identifiable and distinct cognitive phenotype that could be helpful in differential diagnostic workup.

**Categories:** Epilepsy/Seizures

**Keyword 1:** cognitive functioning

**Keyword 2:** pediatric neuropsychology

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## 42 Social Problems in Childhood Epilepsy as it Relates to Overall Intellectual and Adaptive Functioning and Social Skills

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**Objective:** Previous studies have demonstrated a high prevalence of social and emotional problems in young adults with a history of childhood epilepsy, with social skill impairment hypothesized to play a significant role in these outcomes. Few studies have examined social skills within children with epilepsy and very few have examined this within the context of other neuropsychological and neurological variables. This study aims to examine the association between social problems and other relevant neuropsychological variables (IQ, adaptive functioning, social skills) within the pediatric epilepsy population.

**Participants and Methods:** Participants were 86 epilepsy patients between the ages 5 and 18 years of age who were referred for neuropsychological assessment as a part of

their surgical candidacy work-up. Pearson correlation analysis was conducted to examine the correlations between performance on objective measures of full-scale IQ, and parent ratings on questionnaires assessing parent perception of the patients' overall adaptive functioning, social skills, and social problems.

**Results:** As expected, earlier age of onset was associated with lower IQ, which itself was associated with weaker overall daily living skills and social skills. Later age of seizure onset was associated greater social problems. Social skills were not correlated with social problems.

**Conclusions:** The results of this study suggest that children with later age of onset of seizures, are at increased risk of social problems and that these problems may not related to social skill impairment. Implications for clinical practice and future directions are discussed.

**Categories:** Epilepsy/Seizures

**Keyword 1:** epilepsy / seizure disorders

**Keyword 2:** adaptive functioning

**Keyword 3:** social cognition

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### 43 Laterality of Hippocampal Volume Differentially Predicts Verbal Versus Nonverbal Memory Performance

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**Objective:** Epilepsy is a chronic neurological disease, and surgery is a common treatment option for persons who do not respond to medication. Neuropsychology plays an important role in the epilepsy presurgical workup, characterizing the cognitive functioning of patients with epilepsy as well as assisting in the determination of which hemisphere seizures originate in the brain through testing of different cognitive functions. NeuroQuant is a relatively newer software that analyzes clinical neuroimaging to quantify brain volume. The objective of this study was to determine if changes in left versus right total hippocampal volume predicted changes in verbal versus nonverbal memory performance.

**Participants and Methods:** Cognitive performance and NeuroQuant bilateral hippocampal volume were examined in a cross-sectional sample of 37 patients with epilepsy. All patients had undergone a comprehensive presurgical neuropsychological evaluation as well as magnetic resonance imaging (MRI) and these results were analyzed using a series of linear regression analyses.

**Results:** Total left hippocampal volume was a significant predictor of delayed verbal free recall (RAVLT  $F(1, 31) = 4.79, p < .036, R^2 = 0.13,$  and  $\beta = .37, p < .036$ ). Even when controlling for the effects of biological sex, education, and depression, left hippocampal volume remained a significant predictor ( $\beta = .42, p < .025$ ). Total left hippocampal volume did not predict other verbal memory scores. Total right hippocampal volume was a significant predictor of delayed nonverbal figure recall (RCFT  $F(1, 31) = 6.46, p < .016, R^2 = .17$  and  $\beta = .42, p < .016$ ). When controlling for the effects of biological sex, education, and depression, right hippocampal volume remained a significant predictor ( $\beta = .404, p < .026$ ). Total right hippocampal volume did not predict other nonverbal memory scores.

**Conclusions:** These findings validate prior research demonstrating the importance of the left hippocampus in verbal memory and right hippocampus in nonverbal memory. Findings also demonstrate the clinical utility of neuropsychological evaluation in determining laterality in the epilepsy presurgical workup process, as well as support NeuroQuants' inclusion as an additional consideration in that process.

**Categories:** Epilepsy/Seizures

**Keyword 1:** epilepsy / seizure disorders

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### 44 Finding the Onramp: Understanding Access to Neuropsychological Evaluation in New Onset Pediatric Epilepsy

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