

## 88 Considering Lateralization and Localization of Neurosurgical Intervention for Predicting Treatment Response to Computerized Cognitive Remediation (CCR) Targeting Attention and Working Memory: A Case Series

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**Objective:** Lateralization and localization of neuropathology helps determine the extent to which eloquent cortex and diseased brain tissue share loci, important information for neurosurgical decision-making, and predicting neurocognitive outcomes. Emerging data suggest that lateralization and localization can inform specific neurorehabilitation approaches following acquired brain injury (ABI). In recent years, computerized cognitive remediation (CCR) of attention and working memory (WM) has been included among treatment guidelines to enhance cognition in post-acute recovery following ABI. Although CCR has shown promise for improving attention and executive functioning in ABI, it is unknown how treatment response may be predicted by locus of ABI. Even less is known about the effects of CCR following neurosurgery. The current study explores neurosurgical lateralization and localization as potential variables for predicting treatment response to CCR.

**Participants and Methods:** Adult patients with a variety of neurological diagnoses (N = 17; ~47% women) completed a full course of Cogmed Working Memory Training (CWMT) s/p neurosurgical intervention. All participants engaged in 30 sessions of CWMT over eight weeks, as well as neuropsychological (NP) assessment at pre-training baseline, immediate post-training, and at 3-month follow-up. Objective and subjective indices of attention, working memory, executive functioning, and emotional well-being were evaluated at three time-points. Neurosurgical loci included left-hemisphere frontal, temporal, and temporoparietal lobes, as well as right-hemisphere frontal, frontotemporal, and temporal lobes.

**Results:** NP data were reviewed and yielded a clinical impression of cognitive and affective functioning for a cohort of patients with heterogeneous diagnoses (e.g., brain tumor, epilepsy, NPH). Preliminary NP findings suggested that treatment response to CCR for WM was consistent with extant literature on brain-behavior relationships according to lateralization and localization of neurosurgical intervention.

**Conclusions:** Neurosurgical patients experience neurocognitive and affective dysfunction that may respond well to cognitive rehabilitation (CR) that includes CCR. Additionally, it is possible that lateralization and localization of surgical intervention may contribute to individual differences in treatment response. Further neurorehabilitation research is warranted to identify patients most likely to benefit from CCR and better tailor CR modalities to optimize recovery s/p neurological surgery.

**Categories:** Cognitive Intervention/Rehabilitation

**Keyword 1:** brain injury

**Keyword 2:** cognitive rehabilitation

**Keyword 3:** laterality

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## 89 A Pilot Study of a Parent-Delivered Game-Based Cognitive Intervention in Children Born Preterm

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**Objective:** Preterm birth (gestational age < 37 weeks) is associated with delays in the development of executive functions and their precursors, including controlling attention and retaining task-relevant information. In the current study, we aim to examine the potential therapeutic effects of a novel cognitive tablet game, Dino Island (DI), and its implementation through a parent-delivered intervention program on cognitive development in preterm children.

**Participants and Methods:** In total, 34 participants (M = 4.99 years old) were recruited from a perinatal follow-up clinic or through the community in Calgary, AB. Participants were randomly assigned to either the DI intervention (n = 20) or tablet-based educational control games (C; n = 14). Parents completed a 2-hour training program that included information about how to support their child through the intervention using behavioural supports and metacognitive strategies.

Neuropsychological assessment was done prior to beginning the intervention and after 12 weeks of intervention. Various tests were used to assess near transfer measures of sustained attention, shifting attention, executive function, verbal working memory and inhibition, and to assess far transfer measures of language skills and early numeracy. Families tracked weekly progress using journals, with the goal of 3-4 30-minute sessions per week. Multiple ANCOVA analyses were run to analyze quantitative data using the pre-test score as a covariate.

**Results:** A total of 21 participants completed the 12 weeks of intervention (DI: n = 11 and C: n = 10). Those who did not complete the intervention withdrew from the study or were unable to make a follow-up assessment due to COVID-19 restrictions. Groups did not significantly differ in age (DI: M = 4.92, C: M = 4.61), sex (DI: Female = 6, C: Female = 6), or in weeks preterm (DI: M = 29.49 weeks, C: M = 32.7 weeks).

Multiple ANCOVAs were run to determine the effect of either the DI or Control intervention on the cognitive measures after controlling for the pre-intervention score of participants. As compared to the Control group, the DI intervention group showed near transfer gains in sustained attention ( $F(1,7) = 5.1, p = 0.043$ ), and executive functions ( $F(2,18) = 5.41, p = 0.014$ ), as well as far transfer gains in phonetic awareness ( $F(2,16) = 11.63, p = 0.001$ ), vocabulary and oral language skills ( $F(2,7) = 5.54, p = 0.014$ ), and number identification fluency ( $F(2,17) = 11.37, p = 0.001$ ). Detailed analyses will be discussed in the poster.

**Conclusions:** This study provides preliminary support for the potential efficacy of the DI intervention when delivered by parents to children born preterm. Pre-post testing after 12 weeks of intervention indicated both near and far transfer gains. These results highlight the benefits of utilizing a tablet game format to facilitate collaborative parent-child interactions in cognitive intervention. This intervention provides

a potential affordable and engaging alternative to existing cognitive interventions. Further investigation with a larger and more diverse sample is required.

**Categories:** Cognitive Intervention/Rehabilitation

**Keyword 1:** cognitive rehabilitation

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## 90 School-based Implementation of Educational and Neurocognitive Interventions in Children with Neurodevelopmental Disorders.

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**Objective:** Children with neurodevelopmental disorders (NDDs) commonly experience attentional and executive function (EF) difficulties that are negatively associated with academic success, psychosocial functioning, and quality of life. Access to early and consistent interventions is a critical protective factor and there are recommendations to deliver cognitive interventions in schools; however, current cognitive interventions are expensive and/or inaccessible, particularly for those with limited resources and/or in remote communities. The current study evaluated the school-based implementation of two game-based interventions in children with NDDs: 1) a novel neurocognitive attention/EF intervention (Dino Island; DI), and 2) a commercial educational intervention (Adventure Academy; AA). DI is a game-based attention/EF intervention specifically developed for children for delivery in community-based settings.

**Participants and Methods:** Thirty five children with NDDs (ages 5-13 years) and 17 EAs