

New study examines promising approach to treating attention and working memory difficulties in child

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An adaptive cognitive training program could help treat attention and working memory difficulties in children with sickle cell disease (SCD), a new study published in the *Journal of Pediatric Psychology* shows.

These neurocognitive difficulties have practical implications for the 100,000 individuals in the U.S. with SCD, as 20-40% of youth with SCD repeat a grade in school and fewer than half of adults with SCD are employed. Interventions to prevent and treat neurocognitive difficulties caused by SCD have the potential to significantly improve academic outcomes, vocational attainment and quality of life.

The study, led by Steven Hardy, Ph.D., director of Psychology and Patient Care Services at the Center for Cancer and Blood Disorders at Children's National Hospital, examined a promising approach using an adaptive cognitive training program (known as Cogmed Working Memory Training) that patients complete at home on an iPad.

Using a randomized controlled trial design, children were asked to complete Cogmed training sessions 3 to 5 times per week for about 30 minutes at a time until they completed 25 sessions. The Cogmed program involves game-like working memory exercises that adapt to the user's performance, gradually becoming more challenging over time as performance improves. The team found that patients with sickle cell disease (SCD) who completed the cognitive training intervention showed significant improvement in visual working memory compared to a waitlist group that used Cogmed after the waiting period. Treatment effects were especially notable for patients who completed a training "dose" of 10 sessions.

"Patients who completed at least 10 cognitive training sessions showed improved visual working memory, verbal short-term memory and math fluency," Dr. Hardy said.

SCD increases risk for neurocognitive difficulties because of cerebrovascular complications (such as overt strokes and silent cerebral infarcts) and underlying disease characteristics (such as chronic anemia). Neurocognitive effects of SCD most commonly involve problems with

attention, working memory and other executive functions.

"This study demonstrates that digital working memory training is an effective approach to treating neurocognitive deficits in youth with [sickle cell disease](#)," Dr. Hardy added. "We also found that benefits of the [training](#) extend to tasks that involve short-term verbal [memory](#) and math performance when patients are able to stick with the program and complete at least 10 [training sessions](#). These benefits could have a real impact on daily living, making it easier to remember and follow directions in school and at home, organize tasks or solve math problems that require remembering information for short periods of time."

To date, there have been few efforts to test interventions that address the neurocognitive issues experienced by many individuals with SCD. These findings show that abilities are modifiable and that a non-pharmacological treatment exists.

More information: Steven J Hardy et al, A Randomized Controlled Trial of Working Memory Training in Pediatric Sickle Cell Disease, *Journal of Pediatric Psychology* (2021). [DOI: 10.1093/jpepsy/jsab030](https://doi.org/10.1093/jpepsy/jsab030)

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