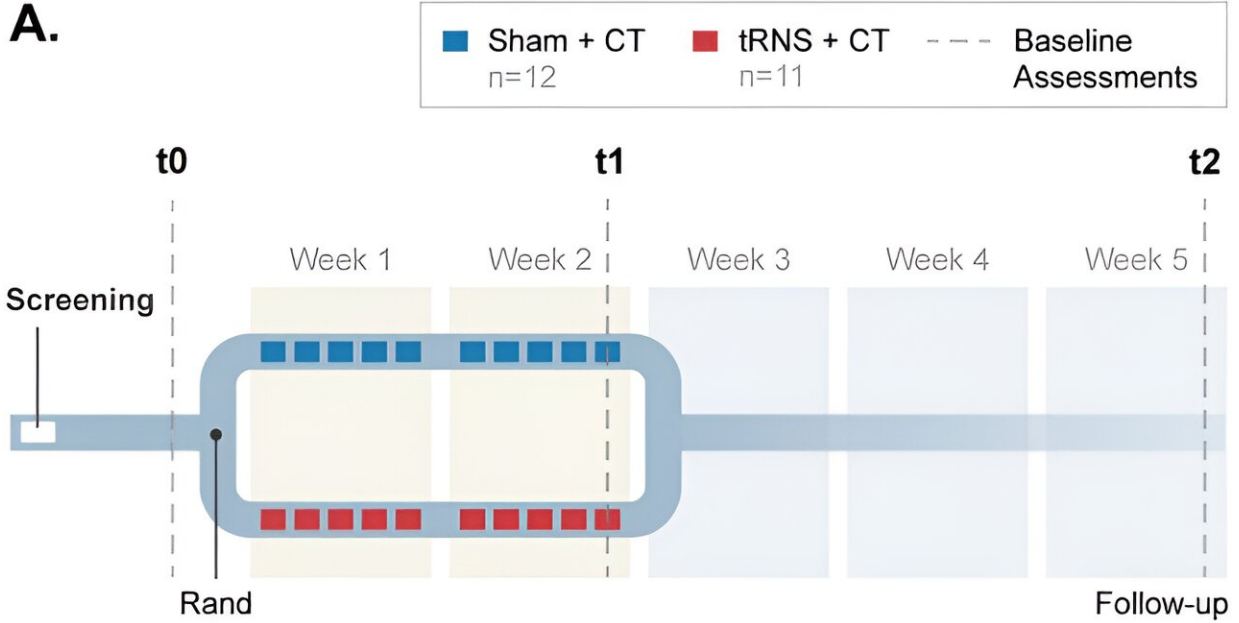


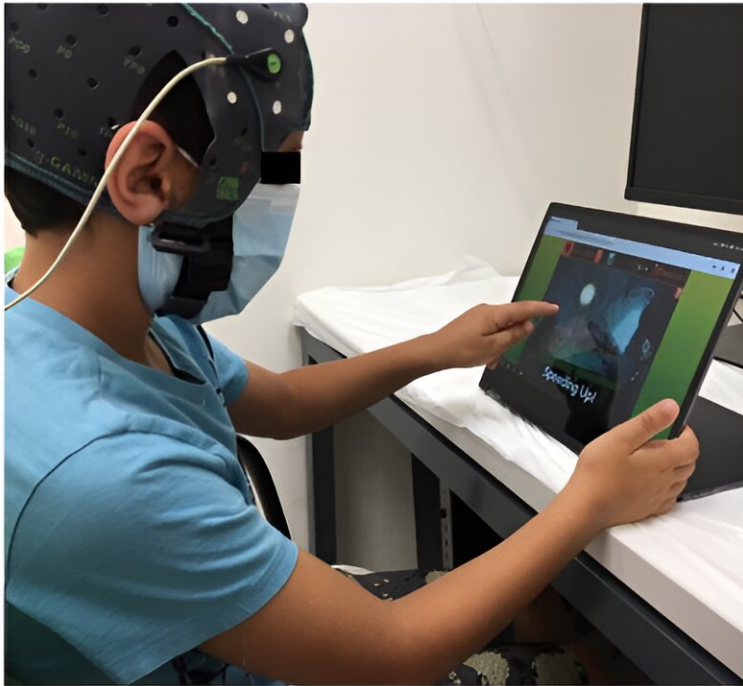
ADHD: Study finds that noninvasive brain stimulation treatment can ease symptoms

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Study design. Credit: *Translational Psychiatry* (2023). DOI: 10.1038/s41398-023-02547-7

Non-invasive brain stimulation, combined with cognitive training, could significantly improve symptoms of attention deficit hyperactivity disorder (ADHD) in children, according to new research jointly led by the University of Surrey and the Hebrew University of Jerusalem.

In a clinical trial involving 23 unmedicated [children](#) (six to 12 years old) with ADHD, researchers set out to find out whether a novel form of brain stimulation that involves a mild electrical current on the brain through two electrodes, during cognitive training, can improve the symptoms of ADHD.

After a two-week program of brain stimulation, the study found that 55% of children showed significant clinical improvements in ADHD symptoms, as reported by their parents. This was compared to 17% in the [control group](#) who received sham (placebo) brain stimulation, during cognitive training.

The study also found that these improvements were maintained three weeks after the end of the treatment, with 64% reporting clinically meaningful responses to the treatments. This is compared to 33% in the control group. The study has been published by *Translational Psychiatry*.

Professor Roi Cohen Kadosh, co-lead of the study, head of the School of Psychology and professor of cognitive neuroscience at the University of Surrey, said, "I believe that the [scientific community](#) is duty-bound to investigate and develop evermore effective and longer-lasting treatments for ADHD. The findings we demonstrate in our study suggest that a combination of transcranial direct current stimulation (tRNS), which is shown to be safe with minimal side effects, has the potential to transform the lives of children and their families."

"The results from this proof-of-concept study, together with previous results we received using tRNS, increase our confidence that in the

future non-invasive brain stimulation may be able to provide an alternative to medication as a treatment pathway for children. However, our important test will be the results from a multi-center clinical trial with a larger sample that we will start soon. If successful, this approach will be approved as a [medical device](#) for ADHD by the United States Food and Drug Administration."

ADHD is a brain condition that affects people's attention, activity, and impulsivity. Around 5.2% of children worldwide have the condition, which usually manifests itself with children struggling with focus, memory, and self-control.

Following the treatment, the research team also noticed changes in the children's [brain](#) electrical activity patterns that continued even at the three-week follow-up.

Dr. Mor Nahum, co-lead of the study and Head of the Computerized Neurotherapy Lab at the Hebrew University where the study took place says, "This is an important first step in offering new therapeutic options for ADHD. Future studies, with larger and more varied samples, should help establish this as a viable therapy for ADHD, and help us understand the underlying mechanisms of the disorder."

Professor Itai Berger, co-lead of the study, previously head of pediatric neurology at Hadassah, currently at Assuta-Ashdod University Medical Center, who recruited the study participants, says, "If the results will be replicated in future larger studies we will be able to offer a novel, promising non-invasive, and safe treatment to large number of children and their families not only in the field of ADHD but in other neuro-developmental disorders."

Ornella Dakwar-Kawar, a post-doctoral researcher at The Hebrew University of Jerusalem, says "ADHD is one of the most common

neurodevelopmental disorders affecting children across the world. Treating the condition with medication improves a child's attention span and overall mood, however in certain cases there can be side effects including headache and a loss of appetite."

"There is therefore a pressing need for developing and testing novel, non-pharmacological interventions for ADHD. Results from the current proof-of-concept study provide a preliminary direction towards a novel intervention in pediatric ADHD."

More information: Dakwar-Kawar Ornella et al, Transcranial random noise stimulation combined with cognitive training for treating ADHD: a randomized, sham-controlled clinical trial, *Translational Psychiatry* (2023). [DOI: 10.1038/s41398-023-02547-7](https://doi.org/10.1038/s41398-023-02547-7)

Provided by University of Surrey

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