

# Lay Summary

June 4, 2025

## **Noninvasive Brain Stimulation Therapy for Children with Cerebral Palsy: A Random Selection Study**

### **Why was the research done?**

Hemiplegic cerebral palsy (CP) is usually caused by perinatal stroke. Hemiplegic CP affects motor function on one side of the body. This physical disability can impact quality of life for children with CP. There are few interventions that are effective for helping children with CP improve motor function. There is a need for new ways to improve motor function for children with CP. Current research shows that some children experience benefits from hand movement therapy.

Noninvasive brain stimulation may improve hand movement therapy outcomes. In this study, the noninvasive brain stimulation used is called transcranial direct current stimulation (tDCS), which uses a low-intensity electrical current to influence brain activity. This technology is safe, painless, inexpensive, and portable. Previous research shows that noninvasive brain stimulation helps adults with stroke. The researchers wanted to study if this intervention works with children with hemiplegic CP.

### **How was the research done?**

All participants in this study were between six and 18 years old and had hemiplegic CP due to perinatal stroke. Participants signed up for a 10-day camp. This camp included 75 hours of hand movement therapy. Participants were split into two groups through random assignment. One group received real tDCS and the other group received fake tDCS ("sham"). This happened during 30 minutes of hand movement therapy everyday. Sham tDCS looked the same as real tDCS, but

there was no brain stimulation. This made it seem like all participants were receiving real tDCS. This was important so that everyone thought they had the same chance to improve.

Before the intervention, the research team measured participants' motor function using a standardized tool. They then measured motor function at regular intervals throughout the study, for a total of 8 assessments. They also measured quality of life, social outcomes, and participation in daily activities. The occupational therapist who did the assessment was blinded to each participant's group. This means they did not know who was receiving real tDCS and who wasn't. Safety was measured with three validated tests.

### **What were the results of the study?**

A total of 89 participants went to one of three camps in Calgary, Edmonton, and Toronto, Canada. Forty-four participants were assigned to the real tDCS group. Forty-five participants were assigned to the sham group. The median age of participants was 10.7 years, so half of the participants were younger than 10.7 years and half were older than 10.7 years. Researchers looked at outcomes for 83 participants who completed the study and all of the assessments. No difference was seen between the tDCS group and the sham group. However, a measured improvement in hand function was noted for most participants 6 months after the intervention. This means that the hand therapy camp helped improve children's hand function. In this study, tDCS did not add any benefit to the hand therapy.

### **What should youth with disabilities and their caregivers know?**

Research already shows that movement therapy improves hand function for children with CP. This study confirms existing research about hand therapy. It also showed that tDCS is safe. However, this specific approach to brain stimulation did not add to the benefits of therapy. Future research may examine whether other ways of using tDCS could be helpful. This study highlights again that personalized intensive movement therapy helps children with CP.



### Glossary of terms

tDCS – transcranial direct current stimulation

CP – Cerebral Palsy

CHILD-BRIGHT Network – A national network in Canada that works to support children with disabilities and their families

### This summary is based on the following article:

Hilderley A.J., Dunbar M., Andersen J., et al. Neuromodulation for Children With Hemiparesis and Perinatal Stroke: A Randomized Clinical Trial. *JAMA Neurol.* 2025;82(3):267–275. doi:10.1001/jamaneurol.2024.4898

### Where can I learn more about this study?

The original article reports on the research done by the University of Calgary [SPORT project](#) which is funded by [CHILD-BRIGHT Network \(Phase 1\)](#). A visual abstract of the study can be found [here](#).

This lay summary was prepared by the CHILD-BRIGHT Network Knowledge Mobilization Program. To provide feedback on this summary, please complete [this survey](#) or scan the QR code below.

