

What did we learn?

- Short-term improvements on grasping ability were observed in 2/3 children (**primary outcome**), whereas one child's ability deteriorated
- Only one child had consistent improvements across most outcomes, suggesting a **positive treatment effect**
 - The remaining two cases had inconclusive clinical responses.
- **All children showed improvements in some of our sensory measures**
 - Any possible therapeutic effects of FES on these measures are of limited value unless accompanied by meaningful improvement in functional ability
- Most of the positive benefits observed immediately post-treatment were **not maintained** at the 6-months follow-up assessment
- FES was **well tolerated** with minimal discomfort
- **Willingness to participate in the study was low** and limited by the burden of high time commitment to attend sessions

Impact for clients, families, and clinical practice

- To date, **only a handful of studies** have evaluated the impact of FES therapy in upper limb for children with HCP
- The results of our exploratory study will **help guide the use of possible alternative treatment strategies** that can minimize or eliminate the potential for continued impairment by progressing the rehabilitation process with the end goal of increasing children's hand functional ability

Next Steps

- Our preliminary findings suggest that FES is a **safe and tolerable clinical intervention** for the upper limb in children with HCP
- **Stronger evidence** of the degree of added benefit(s) for functional is required
- We are currently finalizing the analysis of the data collected during the 6-month follow-up assessments to guide the **significance of the short-term improvements** observed immediately after treatment ended.
- **Future research on FES would need to consider** multi-site participant-recruitment, modifying eligibility criteria (i.e., age, presence of additional clinical features), intensiveness of FES training, and outcome measurement to confirm any treatment effect and suitability

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To learn more about this study please contact Lauren Switzer at lswitzer@hollandbloorview.ca

Improving hand function in children with hemiplegic cerebral palsy

Is there evidence to support using functional electrical stimulation?



An evaluation of the effectiveness of Functional Electrical Stimulation paired with intensive therapy to improve hand function in children with hemiplegic cerebral palsy

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What was this study about?

- Children with hemiplegic cerebral palsy (HCP) have motor impairments that particularly affect **one upper extremity**
- The reduced upper limb function often **limits their performance in functional activities** and participation at home, school, and later vocational roles
- Functional electrical stimulation (FES) involves the administration of electrical impulses using skin electrodes that can activate muscles and **generate functionally useful movements**
- FES has been used to improve upper limb motor function in both adult and pediatric stroke populations, and studies have shown **very positive results**



Objectives

Given that a stroke is often the underlying mechanism of injury in children HCP, we wanted to:

1. Evaluate the **effectiveness and feasibility** of a multichannel FES system to improve hand function in children with HCP
2. Determine whether the results of the proposed treatment were sufficiently robust to justify conducting a subsequent **larger clinical trial**

What did we do?

- **Sample:** Three children with HCP (1 male-2 females, 9 +/- 3.6 years old, age range: 6 years – 13 years)
- **Intervention:** 2 sessions LOK/week and 3 sessions/week of gym-based PT over 8-weeks
- **Assessments:** Each child underwent a battery of assessments before starting treatment (baseline), immediately upon completion of treatment (post-FES), and 6 months after completion of treatment (6 months post-FES)