

### 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](mailto:lswitzer@hollandbloorview.ca)

# Improving hand function in children with hemiplegic cerebral palsy

## Is there evidence to support using functional electrical stimulation?

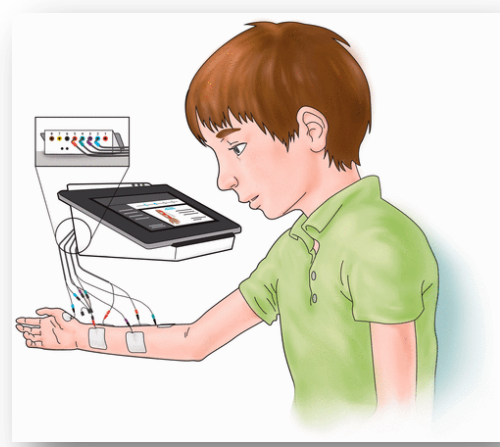


### An evaluation of the effectiveness of Functional Electrical Stimulation paired with intensive therapy to improve hand function in children with hemiplegic cerebral palsy

Darcy Fehlings<sup>1,2,3</sup>, Yvonne Ng<sup>1,2,3</sup>, Betty Chan<sup>1,2</sup>, Lauren Switzer<sup>1,2</sup>, and Luisa Garzon<sup>1,2,3</sup>  
<sup>1</sup>Holland Bloorview Kids Rehabilitation Hospital, <sup>2</sup>Bloorview Research Institute, <sup>3</sup>University of Toronto

### 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)