

Title: Preliminary results of a 2 year prospective cohort study investigating the influence of a home based therapy on the health and well-being of cerebral palsy patients

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Background: Severely affected cerebral palsy (CP) patients (GMFCS 4 and 5) struggle to benefit from conventional non-invasive rehabilitation platforms.

Aim: The feasibility of a high frequency home-based therapy that utilizes parents as the primary caregiver was explored.

Methods and Subjects: A total of 274 American and South American cerebral palsy patients participated. An inclusion criterion further limited patients to GMFCS type 4 and 5. Exclusion criteria restricted use of patients having undergone limb surgery or botulinum toxin A treatments 6 months prior to or over the course of the study leaving 60 relevant candidates. Parents of CP patients were instructed by an experienced physical therapist a home based therapy. Specific stimulation guidelines (pressure magnitude and frequency) were instructed and were monitored using a custom force gauge integrated into the therapy. Therapy was encouraged for at least 30 minutes 5 times a week. CPCHILD questionnaires were completed and collected before treatment and consecutively every 6 months by the parent. Therapy and study directives respect ethical norms. Non-parametric Wilcoxon tests were utilized to perform post-hoc analyses.

Results and discussion: Baseline CPCHILD scores agreed with published mean values. To date, GMFCS type 4 patients improved their CPCHILD scores by 5 points (8%, $p=0.2$), 9 points (18%, $p=0.3$), and 6 points (12%, $p>0.5$) over initial measures after 6, 12, and 18 months of home therapy respectively. Correspondingly, GMFCS type 5 patients improved their CPCHILD scores by 3 points (5%, $p=0.4$), negligible variation, and 9 points (19%, $p=0.1$) after 6, 12, and 18 months. Although further data is required to achieve statistical significance, preliminary trends in results suggest home based therapy using high frequency manual stimulation is a feasible platform for the improved health and wellbeing of severely affected cerebral palsy patients.