

Stabilization Method for Selective Motor Control Testing in Children with Cerebral Palsy

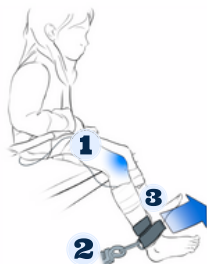
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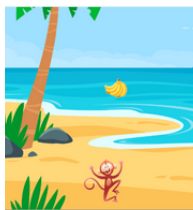
Problem

CHOP researchers in Neuromotor Performance Lab (NMPL) conducting lower extremity selective motor control testing for children with Cerebral Palsy (CP)

Current Testing Method at CHOP



- 1 Electrode**
Muscle activity
- 2 Load Cell**
Force from movements
- 3 Angular displacement**



Perform movements to complete biofeedback game



Objective

Develop an NMPL-compatible, adjustable device that provides upper body stabilization¹ in children [ages 3-7]² with CP to reduce test time³, facilitating a smoother testing process

1 Counter the max expected moment (knee extension)

2 Adjustable for 3-7 yr. old subjects

3 50% time decrease

Verification Testing

< 15° displacement when 47 N-m is applied



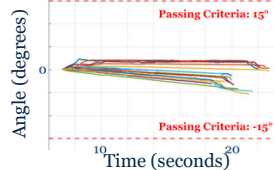
≥ 29 cm through entire weight range



Inconclusive



Angular Displacement of Solution During Largest Child Knee Extension



AVG: 1.1° ± 0.55°



Tested:
13 kg - 40 kg

Conducted one test with solution:

~27% decrease

Impact

Quicker, cheaper, easier testing

Standardized test procedure

Increase consistency and reliability

Inspire innovation for other clinicians

Revisions

Current
Additional dampening support under chair

Future
Continue gathering time & EMG data

Add ankle stabilization methods

References



Demo



Solution



High back booster seat
Weight tolerance: ≤ 50kg
Height tolerance: ≤ 57"

50 cm adjustable track system

Table tightener (A)

Aluminum plates (+Dense Foam)

Modular frame 1" x 1" aluminum profiles