The Preschool HABIT-ILE approach

- pre post analysis of best responders in young children with bilateral cerebral palsy

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* I have no conflicts of interest to declare

Background

Over arching study = Preschool HABIT-ILE

HABIT-ILE = Hand Arm Bimanual Intensive Therapy – Including the Lower Extremities

It is a form of goal directed functional training involving intensive structured practice of bimanual tasks

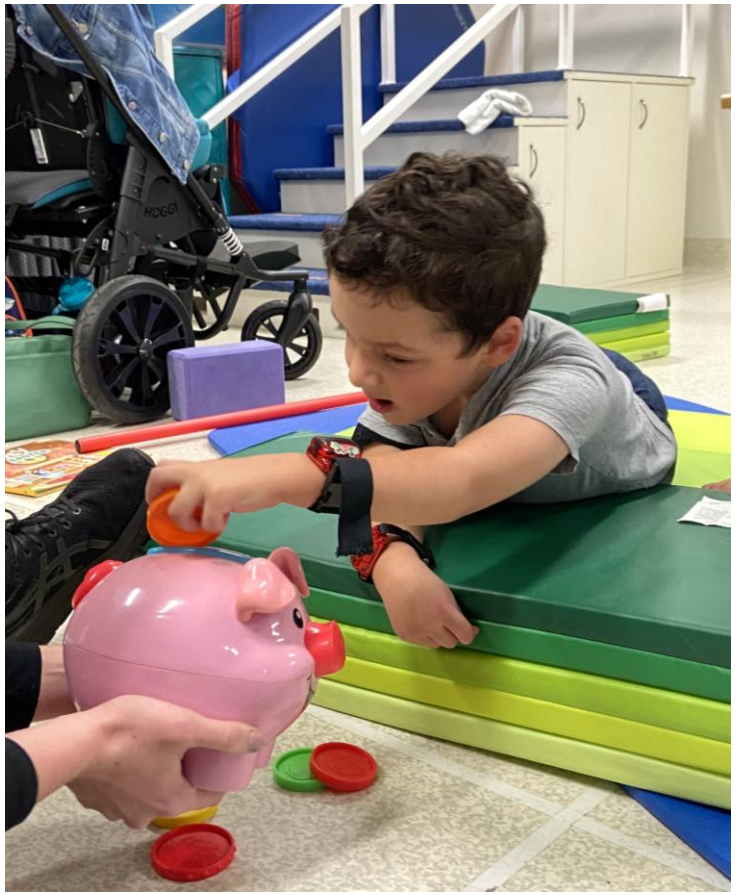
Intervention

- Individual goal directed
- Self driven active movements
- 30 hours (3 hours per day, 10 days)
- Home program approx. 1 hour per day
- Total hours 40

HABIT-ILE therapy is based on the key principles of experience dependent neuroplasticity

Principles of neuroplasticity

- Use it or lose it
- Use it and improve it
- Specificity
- Repetition
- Intensity
- Time
- Salience
- Age
- Transference
- Interference



Objective

To identify key factors associated with improved gross motor function and mobility

Study Participants

Inclusion

- 2-5 yrs
- Bilateral CP
- GMFCS II-IV

Exclusion

- Unable to follow instructions
- Recent orthopaedic/neurological surgery/seizures
- Visual impairment impacting assessment/intervention

Materials/Methods

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Primary outcome:

Gross motor skills

- PDMS-2; 75th percentile cut-off

Secondary outcomes:

Functional mobility

- PEDICAT mobility domain; 75th percentile cut-off

Gross motor function

- GMFM-66; MIC 1.58[a]

Performance of daily activities

- ACTIVLIM-CP; MIC 0.74[b]

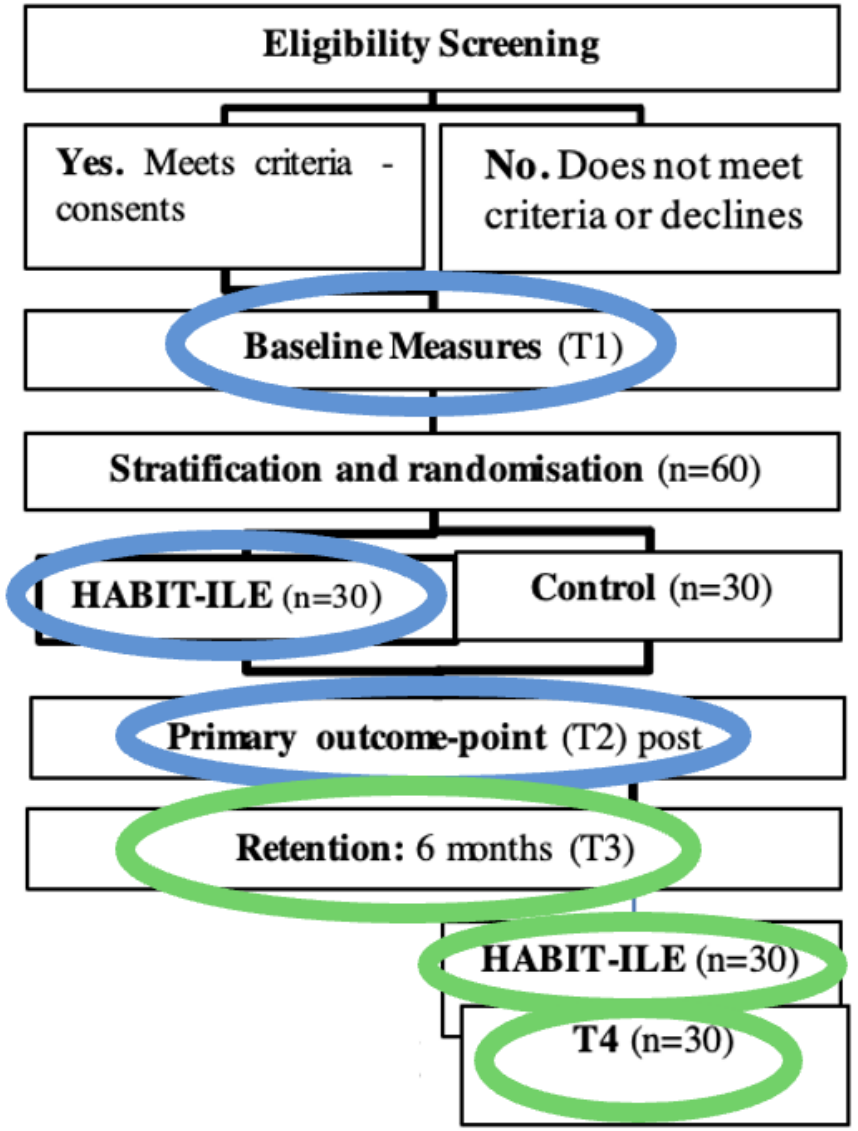
Parent-identified goals

- COPM performance; MIC 2.0[c]

[a] Wang et al 2006, [b] Wang et al 2006b, [c] Fragala-Pinkham et al 2016, [d] Eyssen et al 2011

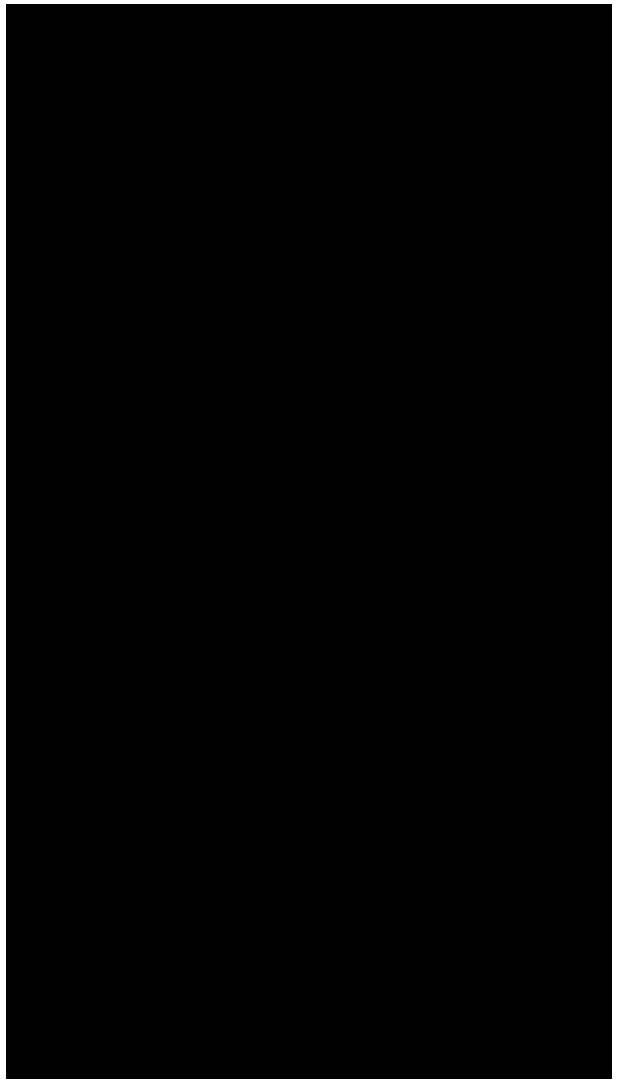
Statistical analysis

- Pre/post-intervention data from immediate and waitlist groups
- Descriptive statistics calculated
- Dichotomised based on 75th cut-off score or MIC
- Logistic regression to explore associations between participant characteristics and achievement of 75th percentile cut-off score or MIC
- Statistical significance was set at $p<0.05$.



Elements of the intervention

The goals are specific, relevant and contextual



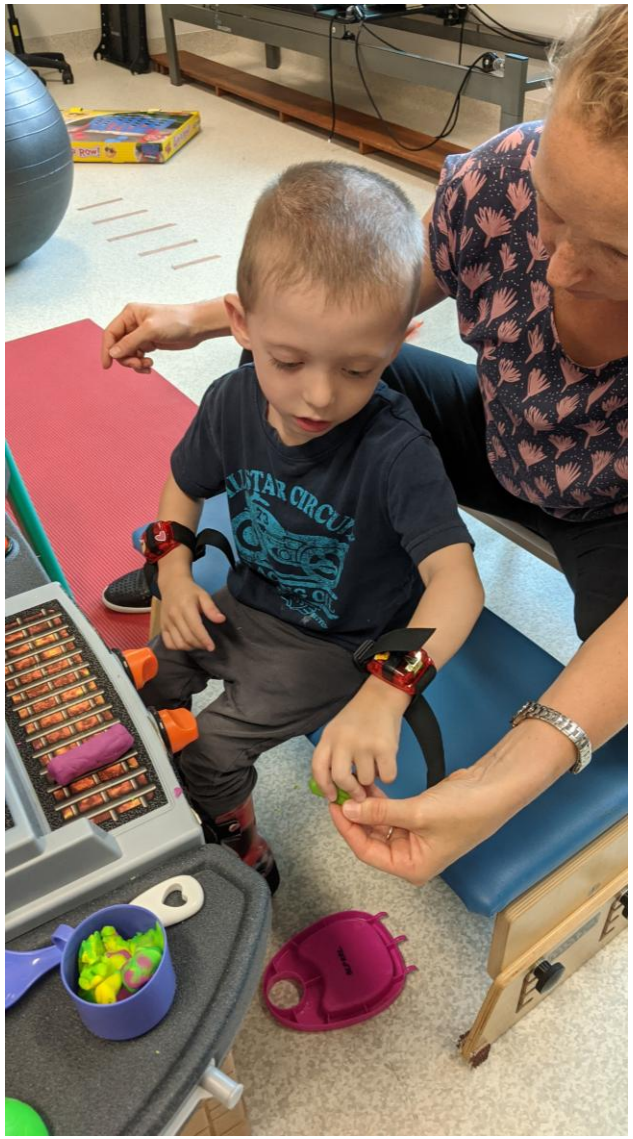
Goal: take socks off while sitting on the floor

Task breakdown

- forward trunk position
- hip and knee flexion
- upper limb extension
- thumb and fingers push down and off leg/foot

Challenges

- limited strength and balance
- weakness in finger flexors
- difficulty coordinating upper + lower limb



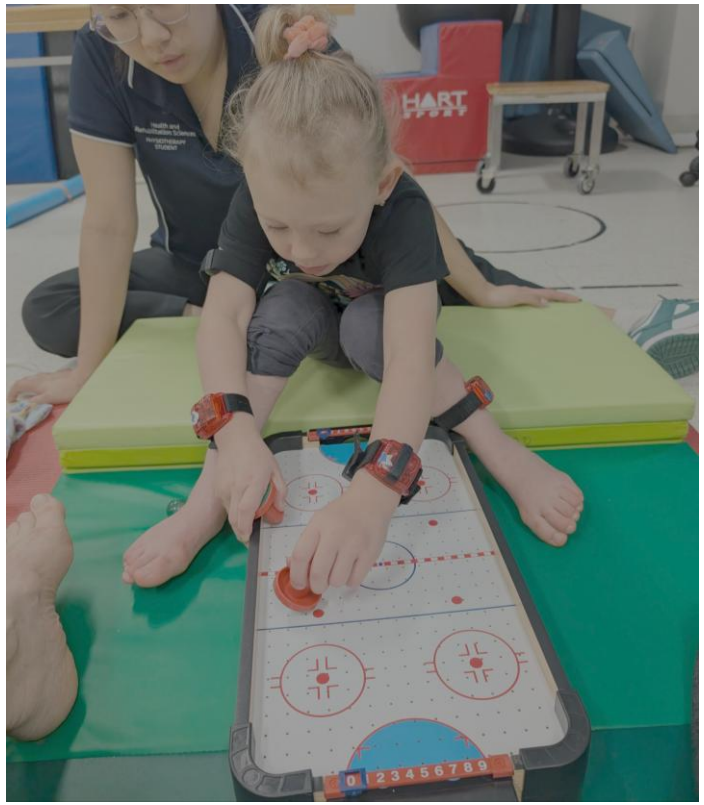
Identify strategies and adaptations

- We practice the task as a ‘part-task’ to develop the child’s ability to perform the goal

Developing Grip strength

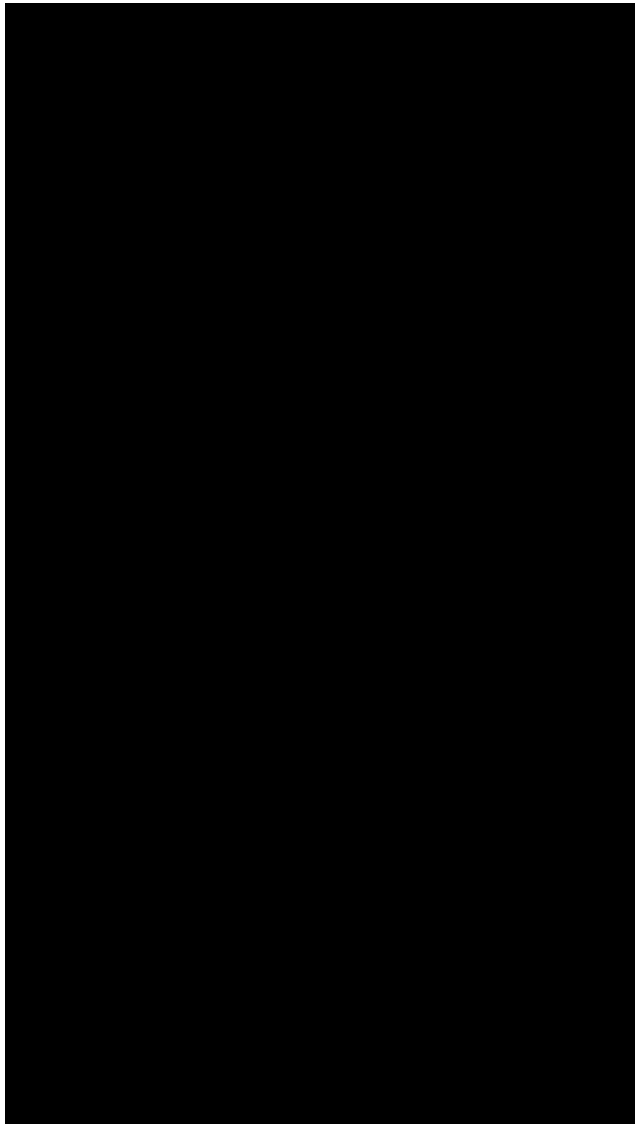
Developing Trunk strength

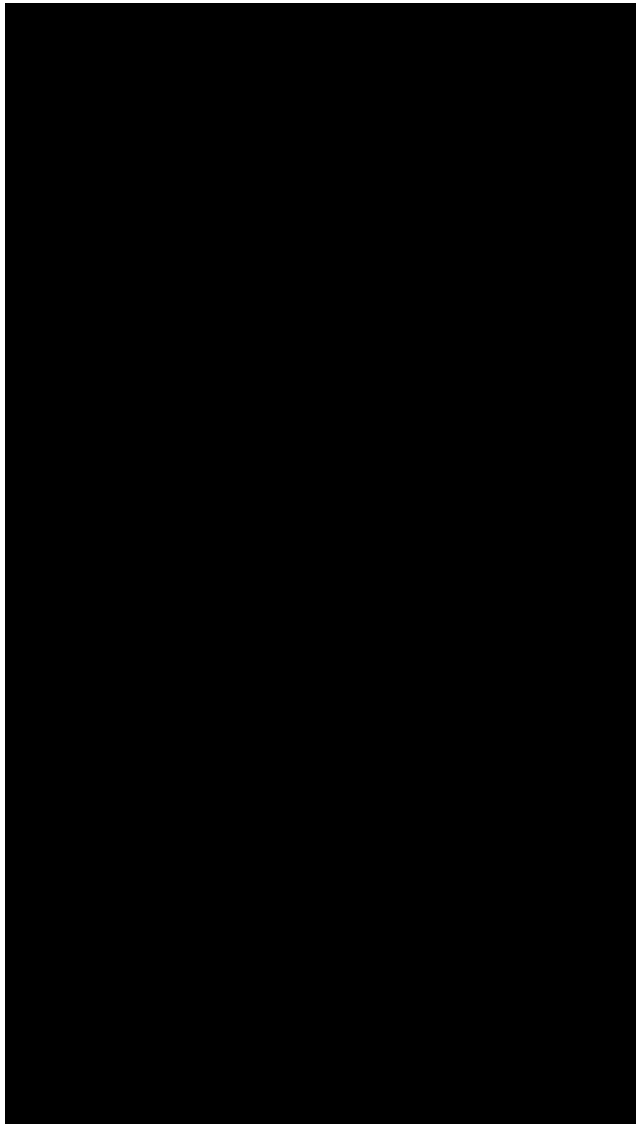
Developing upper and lower limb coordination in sitting position



Whole task practice

Goal attainment





Results

- 20 males/6 females
- Mean age =3.5 years, (SD)= 0.90
- GMFCS levels II =4, III =14, and IV =8
- Diplegia =7, triplegia =5, quadriplegia =14
- Motor types spastic =17, dyskinetic =9
- 15/26 one or more comorbid diagnoses
- Dose (median) =28.5 (range = 9.3 – 43.7)

Results

- 6/26 achieved 75th percentile cut-off :
  - PDMS2 gross motor quotient
  - PEDICAT mobility domain
- 26/26 achieved MIC : COPM performance
  - (6/26 achieved 75th percentile cut-off)
- 8/26 achieved MIC : GMFM66
- 7/26 achieved MIC : ACTIVLIM-CP

Best Responders

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PDMS2 gross motor quotient

- Younger in age

  (OR: 0.85, 95% CI: 0.74 – 0.98, p= 0.03)

- Females

  (OR: 18, 95% CI: 1.92 – 168.99, p = 0.01)

PEDICAT mobility domain

- Lower pre assessment PEDICAT scores

  (OR: 0.63, CI:0.43 to 0.94, p = 0.02)

Limitations

- Sample size small
  - Recruitment

- Many participants did not meet anticipated dose
  - Health reasons
  - Competing commitments
  - Covid restrictions

Conclusion

Children are variable in the way they respond to intervention

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