Feasibility and Functional Outcomes of Dynamic Standing Therapy in Paediatric Cerebral Palsy

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INTRODUCTION

- Children with cerebral palsy (CP) at Gross Motor Functional Classification System (GMFCS) levels III–V often have limited access to task-specific, whole-body mobility training.
- Dynamic supported standing enables rhythmic, weight-bearing movement, potentially supporting:
  - Function
  - Participation
  - Quality of life (QoL)
- Emerging evidence suggests that dynamic and robotic-assisted interventions may improve functional outcomes and QoL, while also eliciting systemic physiological responses.

OBJECTIVE

To explore feasibility and describe functional outcomes of dynamic supported standing in children with CP in real-world clinical and educational settings.

METHOD

Design

Retrospective clinical case series / service evaluation.

Participants

Children aged 5–18 years with CP (GMFCS II–V) and one child with a high cervical spinal cord injury

Intervention

Dynamic supported standing therapy (Innowalk)

- Frequency: 2-5 sessions/week
- Duration: 30-60 minute sessions
- Total intervention: 2 weeks to 6 months
- Post-operative follow-up in selected cases

Outcome measures

- Passive range of motion (PROM) assessed clinically
- Spasticity (Modified Ashworth Scale)
- Bowel function (reported)
- Goal attainment scaling (GAS)
- Family-reported quality of life (QoL)

Analysis

- Descriptive comparison of pre–post changes
- Comparison with existing literature.

CLINICAL IMPLICATIONS

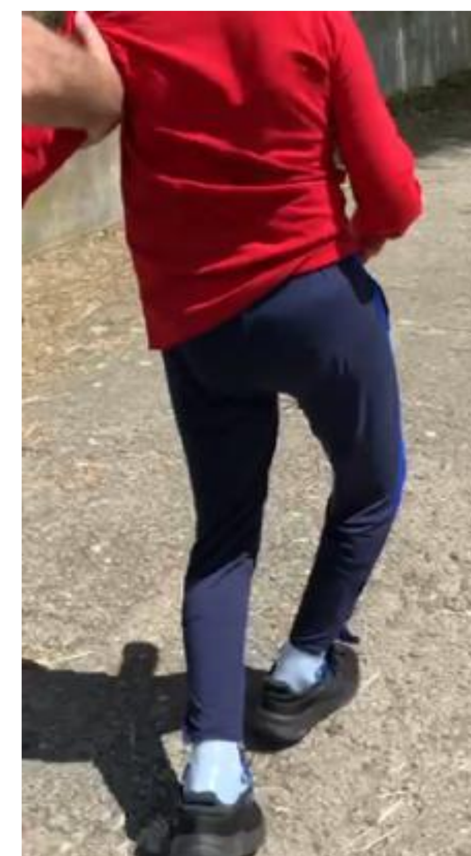
- Dynamic supported standing enables task-specific, repetitive, weight-bearing movement not achievable with static standing
- May support maintenance or recovery of function in children with limited mobility (GMFCS III–V)
- Can be integrated in post-operative rehabilitation pathways
- Provides an opportunity to address participation and engagement, not only body structure/function

CONCLUSION

Dynamic supported standing appears feasible and well accepted in children with cerebral palsy. It was associated with observed improvements in mobility, participation, and perceived quality of life in real-world clinical practice. Further controlled studies are needed to determine optimal dosing, long-term effects and cost-effectiveness.

CLINICAL CASES

Case 1 – Functional decline (GMFCS III)



15 year old adolescent with CP presented with loss of independent ambulation following a growth spurt.

Intervention:
- 5 sessions/week, 60 min, 2 weeks

Outcomes:
- ↑ lower limb PROM
- ↑ endurance
- Recovery of independent gait

19 SEC VIDEO

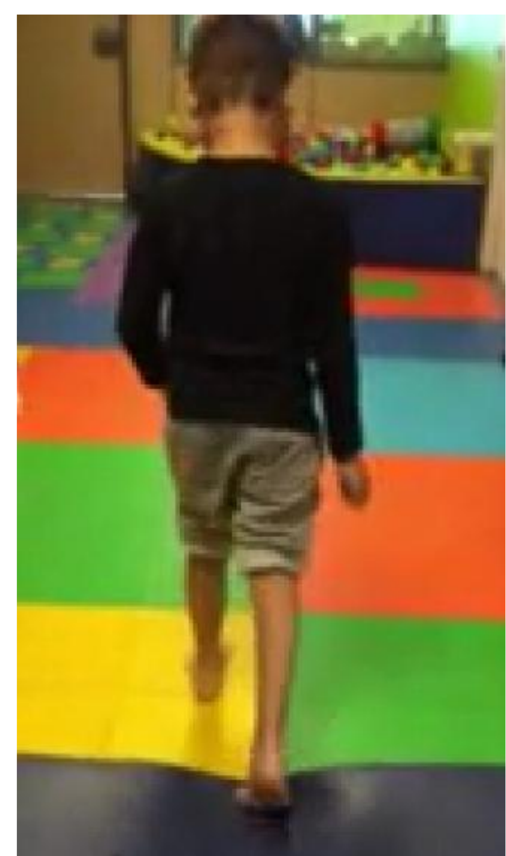
Case 2 – Post-operative rehabilitation (GMFCS II)

6 year old following Achilles tenotomy.

Intervention:
- 2 sessions/week, 50 min, 6 months

Outcomes:
- Improvement in gait pattern
- Supported functional recovery and progression towards greater independence

24 SEC VIDEO



Case 3 – High support needs (SCI C2/C3)

10 year old with complete spinal cord injury using diaphragmatic pacing.

Intervention:
- 3 sessions/week, 45 min, 6 months

Outcome:
- Access to whole-body movement
- ↑ engagement and participation as reported by family
- Improvement in self-esteem

18 SEC VIDEO

DISCUSSION

Observed improvements in mobility, participation, and well-being are consistent with emerging evidence, including:
- Improvements in function and QoL (Gordon et al., 2023)
- Systemic physiological responses associated with dynamic standing (Varga et al., 2024)

Dynamic supported standing may be particularly relevant for children with limited mobility (GMFCS III-V), post-op rehabilitation and long-term management of severe CP.

Limitations:
- Small sample size
- Lack of control group
- Heterogeneous population
- Reliance on clinical and reported outcomes

KEY REFERENCES

- Grodon et al. (2023) – QoL and function
- Varga et al. (2024) – physiological plausibility
- Strobl et al. (2016) – post-surgery relevance

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