

Walkin' On Air: Alter-G Gait Training in a Male with Hereditary Spastic Paraplegia

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BACKGROUND AND PURPOSE:

Hereditary spastic paraplegia (HSP) is a rare neurodegenerative disease affecting the corticospinal tract.¹ Characteristics include progressive loss of strength, lower extremity spasticity, increased metabolic demand of ambulation.^{1,2} These impairments then limit the patient's functional mobility, including gait. Lower body positive pressure supported (LBPPS) treadmill training is a form of body weight supported treadmill training both of which are useful for locomotor training.³

The purpose of this case report is to determine the effectiveness of LBPPS treadmill training, using the Alter-G, to improve the spatiotemporal parameters of gait for a patient with HSP.

CASE DESCRIPTION:

51-year-old male with Hereditary Spastic Paraplegia

Body Structure/Function

- Bilateral extensor tone
- Bilateral lower extremity weakness

Activity Limitations

- Decreased speed of gait
- Decreased tolerance to exercise
- Confined to use of w/c for functional mobility

Participation Restrictions

- Patient not working
- Speaks in the community

METHODS:



Alter-G treadmill



Alter-G display panel

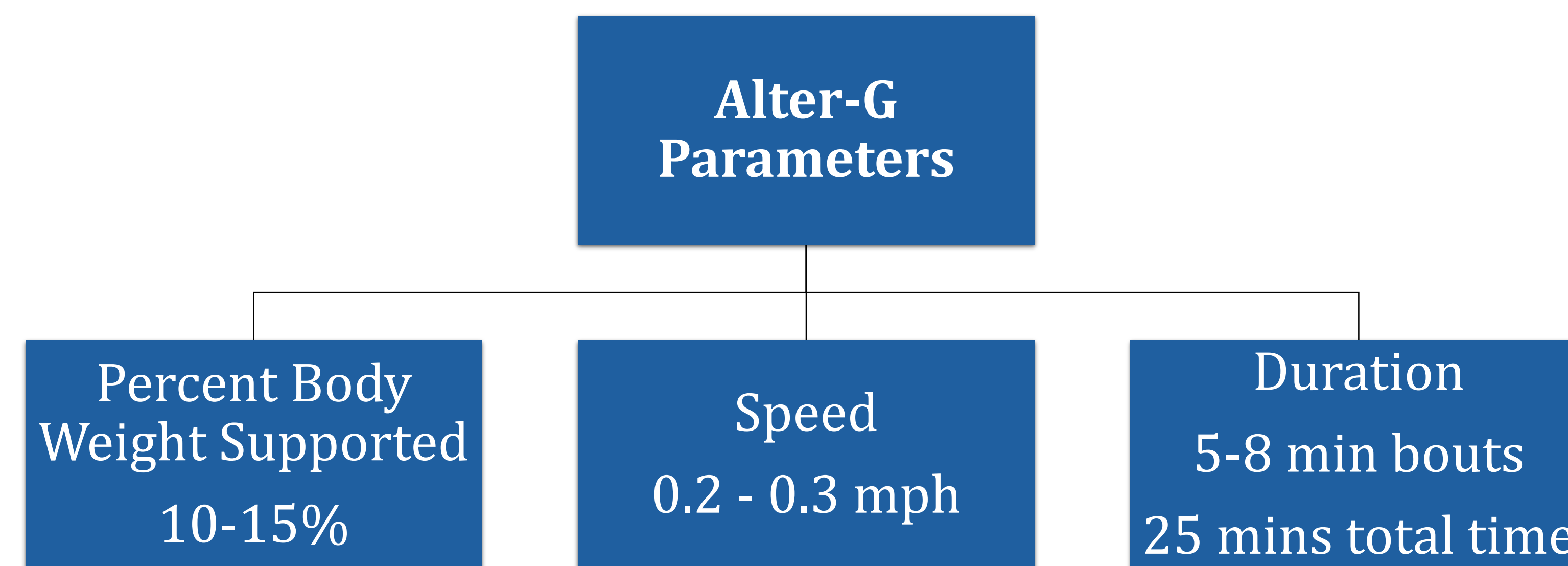


Table 1. Procedure for intervention

Procedure	<ul style="list-style-type: none"> • Alter-G training began once patient was able to ambulate overground with a harness and bilateral crutches. • Five minute warm up at 0.2mph • 5-8 min bouts of ambulation on treadmill with 2-3 min rest between bouts
Feedback	<ul style="list-style-type: none"> • Visual: Used cameras on L and R sides of inflatable bag. Video was projected onto a screen positioned in front of Alter-G to give patient real-time visual feedback. • Verbal: Pt. received verbal cues throughout treadmill training

RESULTS:

Table 2. Changes observed in outcome measures

Outcome Measure	Initial Measurement (week 1)	Final Measurements (week 16)	Amount of Change
Activities-specific balance scale	13%	16%	3%
3-m walk test	0.08 m/s (with Rifton gait trainer)	.26 m/s (with axillary crutches)	0.18 m/s*
10-m walk test	n/a	.27 m/s (with axillary crutches)	n/a
Gait distance	30 ft.	400 ft.	370 ft.

*MDC: 0.05 m/s⁴

CONCLUSION:

Task specific training using LBPPS treadmill training is effective to improve gait evidenced by increased speed of gait and increased distance of ambulation. A gait distance of 400ft is within the range for community ambulation distances, however, speed must to improve before this patient can safely ambulate in the community.⁵

While there is minimal research on physical therapy interventions for treatment of HSP, this case report demonstrates the utility of physical therapy to improve functional mobility in a patient with HSP.

REFERENCES:

