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Who: 67-year-old female with long standing history of Normal Pressure Hydrocephalus (NPH) with moderate balance deficits, loss of balance during ambulation, difficulty negotiating stairs, and history of falls.

What: AlterG Anti-Gravity Treadmill™ was used to help patient safely perform gait and dynamic balance training with increased confidence and safety. Pt. was able to significantly improve TUG, Berg Balance Score, and function. At discharge, patient was Independent with household mobility.

Why: Body weight support provided a safe controlled environment for this patient to work on gait training and dynamic balance.

Introduction

The patient is a 67 year old female with long standing history of Normal Pressure Hydrocephalus (NPH). She presents with moderate balance deficits, staggering and loss of balance during ambulation, difficulty negotiating stairs, and a history of falls. She also presents with poor sitting and standing posture, and significant soft tissue restrictions in the right side of her neck which cause right cervical deviation secondary to her shunt placement. The patient has difficulty maintaining her head in an upright position secondary to loss of balance, weakness, and soft tissue restrictions. She lives in a 1 story, double-wide mobile home with her daughter. There are two sets of stairs to enter the home. The stairs at the front of the home are the standard 8" rise height with one handrail. The stairs at the back of the home have a 10" rise height with two handrails. The patient used to be active around the home; performing household chores, cooking, cleaning, negotiating stairs independently, and walking short distances outside independently. Four months ago, she fell down the steep set of stairs at the back of her house and has been experiencing neck, shoulder, and back pain since. She also lost her confidence in negotiating stairs and ambulating without close supervision.

Goals

3 Weeks

- Stand with feet together for 2 minutes with no loss of balance to decrease risk of falling
- Increase cervical ROM to 90% WNL in order to be able to put away dishes overhead with minimal c/o symptoms

6 Weeks

- Walk 400 feet with head turns and no loss of balance
- Negotiate 10 stairs with no handrails and no loss of balance in order to get into the home safely
- Increase Berg balance score to 41/56 in order to demonstrate improvement in balance
- Reduce her TUG turning to the right to less than 11.5 seconds

History

Staggering and drifting to the right while walking

- Loss of balance during walking when looking up from the ground or performing right head turns
- Staggering to the right when standing at her kitchen counter washing dishes
- Right sided cervical deviation
- Neck, shoulder, and lumbar pain
- Fear of falling
- Bumps into the right side of door frames when passing

Objective Data At Initial Evaluation

- Berg Balance Score of 45/56
- Dynamic Gait Index Score of 17/24
- Core Strength 4/5
- Functional Gait Assessment 26/40 at week 4.

Considerations

The patient has a shunt in the right cervical region. Significant soft tissue restrictions noted throughout the cervical musculature (right > left) which restrict cervical mobility and contribute to

Progression Table

Days	Initial WB%	Incline/Speed	Speed (mph)
<i>Week 2</i>	80%-85%	1.2/1.2	10/10 min
<i>Week 3</i>	80%-85%	1.2/1.2	11/15 min
<i>Week 4</i>	85%	1.2	17min
<i>Week 5</i>	85%	1.2	18 min

right sided cervical deviation. Patient has history of seizures and falls.

Treatment

The AlterG Anti-Gravity Treadmill was implemented the second week of physical therapy. See progression table for details.

Physical therapy treatment for this patient also included gait training, static & dynamic balance training, soft tissue and spinal mobilization, Kinesiotaping, stretching, and postural strengthening.

Results

After training on the AlterG:

- Patient able to walk in a straight line with her head upright with no loss of balance or right sided deviation
- Patient able to perform head turns while walking with no loss of balance
- Patient able to pass through doorways without bumping into the doorframe
- Patient able to negotiate stairs using one handrail with no loss of balance
- Patient able to wash dishes without staggering to the right side
- Patient demonstrated increased confidence and decreased fear of falling at home
- Berg balance score improved from 33/56 to 50/56
- Timed Up and Go scores improved
 - At initial evaluation: 13.03 sec (turning right), 11.91 sec (turning left)
 - At discharge: 8.75 sec (turning right), 8.90 sec (turning left)

Patient progressed quickly through her physical therapy rehabilitation. Patient was seen for 5 weeks prior to moving out of state. At discharge, she was independent with household mobility. Her posture, cervical restrictions, and right sided cervical deviation all improved with physical therapy intervention. The AlterG allowed the patient to perform gait and dynamic balance training with increased confidence and safety. Training on a regular treadmill and over ground were limited by fear of falling, loss of balance, and fatigue. The AlterG allowed the patient to focus on maintaining an upright posture and taking longer steps with direct carryover to over ground walking.

The rehabilitation program incorporating the AlterG enabled this 67 year old patient with Normal Pressure Hydrocephalus to return to an independent lifestyle without fear.