

Physical Therapy Management of a Patient with Stroke Utilizing Muscular Facilitation



UNIVERSITY OF
NEW ENGLAND

Techniques in a Skilled Nursing Facility: A Case Report

Erin Bayne, BS, DPT Student
University of New England

Background

- Stroke is the leading cause of serious long term disability in the United States
- Hemiparesis is a well-known impairment following stroke
- Trunk musculature asymmetry is also common and often overlooked when assessing a patient's muscular control
- Trunk musculature is an essential link between the upper extremities and lower extremities during activities of daily living.
- Impairments in trunk musculature can result in decreased safety and balance.

Purpose

The purpose of this case is to provide the framework for treatment and an overview of a care plan for a patient following stroke, with special attention to trunk musculature facilitation, in a skilled nursing facility.

Case Description

- Elderly Caucasian woman
- Right cerebrovascular accident and left hemiparesis
- 18 days in acute care at her local hospital, where she received daily physical therapy, occupational therapy, and speech therapy
- Transferred to a skilled nursing facility for continued therapy services, which she received 5-7 days per week for 8 weeks.
- Prior to admission she was living independently in a multi-level home and reported community ambulation, driving, and independence with all mobility and age appropriate activities of daily living.

Examination

Tests and measures were done at admission and again at discharge to get an objective picture of the patient's progress. Standardized functional testing, using the 10 meter walk test, was also administered at admission and discharge and intermittently throughout the episode of care in order to monitor progress and make adjustments to the plan of care, as well as for justification for continued physical therapy services.

Table 1: Tests and Measures at Admission and Discharge	Initial Evaluation	Discharge
Bed Mobility	S and increased time to complete task, less than optimal technique	I
Supine to Sit	S and increased time to complete task, less than optimal technique	I with increased time to complete task, min v/c for technique
Transfers	CGA, using RUE as part of BOS and v/c	I at best with UE as part of BOS, occasionally increased attempts required to stand; consistently demonstrates DS level with v/c for SHP and technique
Stand to Sit	CGA, using RUE as part of BOS and v/c to reach back to surface for controlled descent, 12" surface	DS, MI with increased time to complete task and occasional v/c for SHP
Surface to Surface	CGA, using RUE as part of BOS, moving to L and R; moving L requires increased v/c to effectively sequence step prior transfer	I with 1 UE as part of BOS
Ambulation	CGA, 30'	80' with S, DC
With 4 Wheel Walker	CGA, 30'	30' with S, occasional CGA secondary to increased confusion
Without Assistive Device	CGA, 30'	30' with S, occasional CGA secondary to increased confusion
Stairs	Ascending: Descending: 4 steps at 6.5" with B mls, CGA, and reciprocal pattern	12 steps at 6.5" with B mls, S, and reciprocal pattern
Safety	Fair	Good; occasionally Fair secondary to periods of confusion
Behaviors	4/5 for all motions	4/5
Strength	3+ for all motions	4/5
Trunk Extensors	Ability to activate and sustain	Ability to activate and sustain
Trunk Flexors	Ability to activate and sustain	Ability to activate and sustain
Lateral Trunk Flexors	L: able to activate, unable to sustain without v/c during mobility tasks	L: able to activate and sustain 75% of the time without v/c during mobility tasks with increased fatigue
Posture	Neck: Neutral	Neck: Neutral
Standing	Posterior pelvic tilt	Posterior pelvic tilt and slightly forward head
Active Tolerances	Normal activities cause fatigue	Age appropriate activities do not cause increased fatigue
Edema	None noted	None noted
Proprioception	Diminished in LLE	Diminished in LLE (increased from baseline)
Coordination (as reported by DT)	L: decreased accuracy	L: increased accuracy with increased time
Range of Motion	L: Dysdiadochokinesia	L: minimal dysdiadochokinesia
Rapid Alternating Movement (RAM)	L: Impaired	L: increased accuracy with increased time
Serial Organization	L: Impaired	L: increased accuracy with increased time
Gait Analysis	L: Downward pelvic tilt with L stance, corrected with v/c to L lateral lumbar flexors	Narrow BOS with occasional scissoring gait pattern
Without Assistive Device	L: Downward pelvic tilt with L stance, corrected with v/c to L lateral lumbar flexors	Unsteady at times with narrow BOS and occasional scissoring gait pattern
Balance	Static: Fair	Good
Sitting: Static	Fair	Good
Sitting: Dynamic	Fair	Good
Standing: Static	CGA with RUE support	Fair -> Good; static stability L
Standing: Dynamic	Post	Fair -> with 4WW, Post -> without AD
Post	0:0	0:0
CVAS Scale	0:0	0:0
Conclusion	A & O x 3 in person, place, and time	A & O x 3 in person, place, and time; occasionally A & O x 2 in person, place, and time

L: Left; R: Right; B: Bilateral; UE: Upper Extremity; LE: Lower Extremity; AD: Assistive Device; 4WW: Four Wheel Walker; CGA: Contact Guard Assistance; CBS: Close Supervision; S: Supervision; DS: Distance Supervision; MI: Modified Independence; I: Independent v/c; Serial: One at a Time; Coord: Coordination; SHP: Side Hand Placement; BOS: Base of Support; AD: Aid & Control; DT: Occupational Therapy

Table 2: 10 Meter Walk Test	Initial Evaluation	4 Weeks	Discharge (8 weeks)
Without	CGA	CGA/Close Supervision	Supervision
With 4WW	CGA	Close Supervision	Supervision
Without	CGA	CGA/Close Supervision	Supervision
With 4WW	CGA	Close Supervision	Supervision

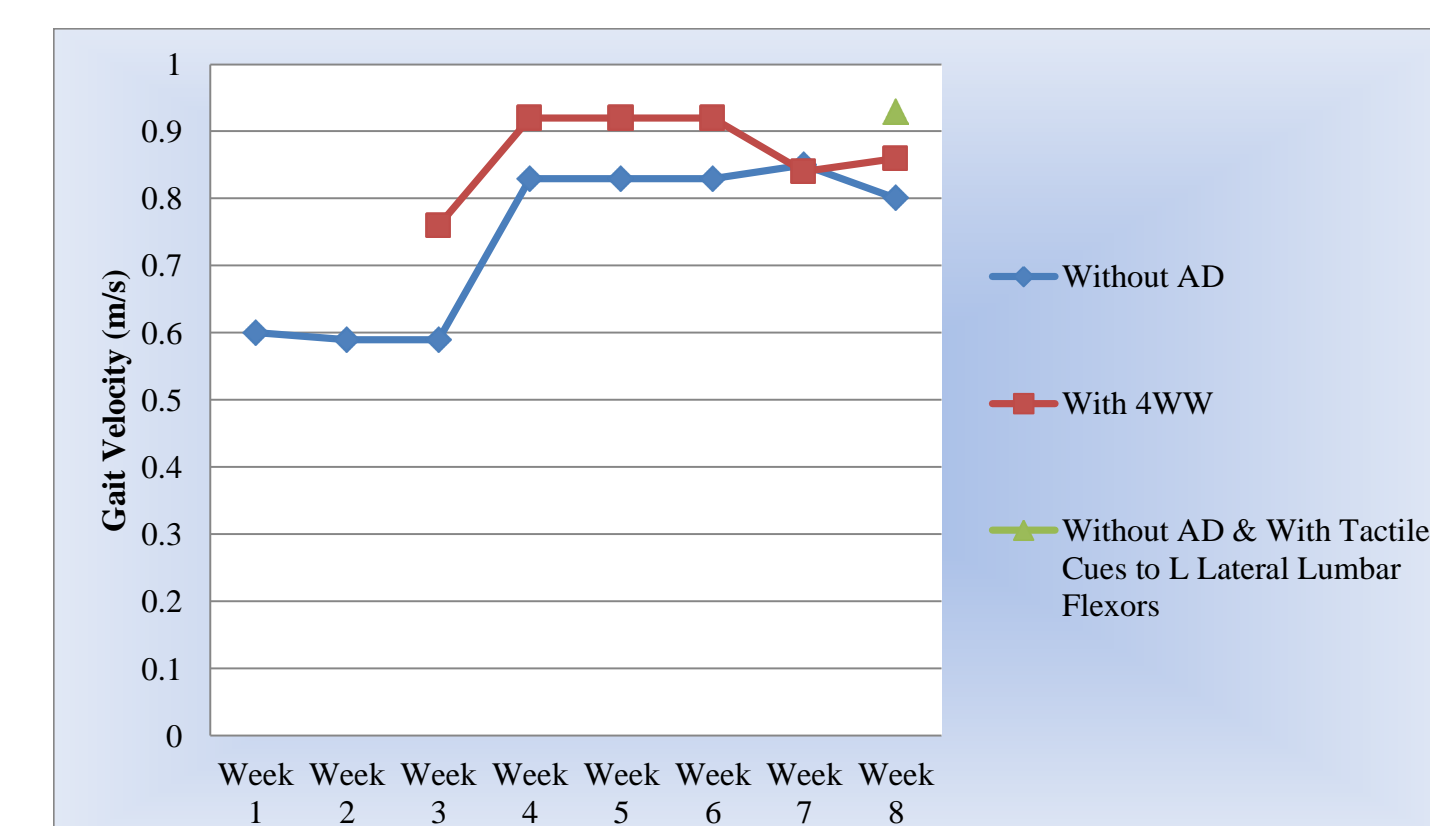


Figure 1: Change in gait velocity as seen on the 10 meter walk test over 8 weeks in physical therapy at a skilled nursing facility

Table 3: Patient Goals	Short Term Goals: To be completed within 1 week	Long Term Goals: To be completed within 4 weeks
1.	The patient will transfer supine <-> sit with verbal cues for technique and supervision in order to decrease burden of care.	1. The patient will independently transfer supine <-> sit in order to decrease burden of care.
2.	The patient will transfer sit <-> stand with supervision and verbal cues from an 18" surface with use of bilateral UEs as part of BOS, in order to decrease burden of care.	2. The patient will independently transfer sit <-> stand and surface <-> surface from a height greater than or equal to 17" without the use of UEs as a part of BOS, in order to decrease burden of care and to increase access to her environment.
3.	The patient will ambulate without an AD x 400 feet, with tactile cues less than 100 feet of the total distance in order to decrease her risk of falls.	3. The patient will ambulate without an AD and with distance supervision greater than 1000 feet and a gait velocity of 1.0 m/s or greater in order to increase access to her environment and to decrease fall risk.
4.	The patient will ascend and descend 12 stairs at 6.5" with bilateral handrails and supervision in order to increase her safe access to her environment.	4. Patient will ascend and descend 12 stairs at 6.5" with supervision and the use of one handrail in order to increase access to her environment.

UE: upper extremities; BOS: base of support; AD: assistive device

PT Diagnosis

Practice Pattern 5D: Impaired Motor Function and Sensory Integrity Associated with Non-Progressive Disorders of the Central Nervous System – Acquired in Adolescence or Adulthood.

Interventions

Table 4: Interventions	Weeks 1 & 2	Weeks 3 & 4	Weeks 5 & 6	Week 7 & 8
ROM	PROM to B hamstrings and gastrocnemius	Dynamic standing	Dynamic standing	Dynamic standing
Strengthening	Optimal sitting, seated LE exercises with 1# and red threshold	Dynamic standing	Dynamic standing	Dynamic standing
Activity Tolerance	Continuous walking x 5 minutes with 10# BOS	Dynamic standing	Dynamic standing	Dynamic standing
Bed Mobility	Supine <-> sit	Supine <-> sit	Supine <-> sit	Supine <-> sit
Transfers	Rolling R and L	Rolling R and L	Rolling R and L	Rolling R and L
Patient Education	Use of the call bell to alert the nursing staff that the needs assistance	Safe use of 4WW during transfers and ambulation	Safe use of 4WW during transfers and stair training	Family education regarding patient's DC to home & need for 24 hours of S
Gait Training	150' x 2 at best without AD	100' with 4WW, inside over level surfaces	800' with 4WW, inside over level surfaces	125' x 2 without AD
Stair Training	Ascend and descend 12 steps at 6.5" with R handrail and reciprocal gait pattern	Ascend and descend 12 steps at 6.5" with B mls and reciprocal gait pattern	Ascend and descend 18 steps at 6.5" with R handrail and step to negotiation	Ascend and descend 12 steps at 6.5" with R handrail and reciprocal gait pattern
Balance Training	Static Standing	Static Standing	Static Standing	Static Standing
Body Weight Support System	6.7-10% BWS	0% BWS used for increased safety with new tasks	0% BWS used for increased safety with new tasks	0% BWS used for increased safety with new tasks
Kinesiotaping	7" strip to toe L lateral lumbar flexors	7" strip to toe L lateral lumbar flexors	7" strip to toe L lateral lumbar flexors	7" strip to toe L lateral lumbar flexors
Aquatic Therapy	Stair in and out of the pool	Stair in and out of the pool	Stair in and out of the pool	Stair in and out of the pool

PROM: Passive Range of Motion; R: Right; L: Left; UE: upper extremity; PF: Plantarflex; DF: Dorsiflex; LAQ: long arch quad; R: raised; BWS: body weight support; ADD: Addition; AID: Addition; 4WW: four wheel walker; min: minimal; mod: moderate; max: maximal; BOS: base of support; SH: scissoring; SHP: Side Hand Placement; PPT: physical performance testing; PFD: foot placement; LOMB: limit of stability; S: supervision; DC: discharge

Interventions were progressed over time including longer and more complex neuromuscular reeducation activities, increased ambulation distances and decreased rest breaks. The patient did endure some regression during weeks 6 and 7 due to pain and confusion.



Figure 2: (from left to right) ambulation with tactile cues to the left lateral lumbar flexors; static reaching with tactile cues to left lateral lumbar flexors; sit to stand with tactile cues to the lumbar extensors.

Outcomes

- She met all of her short term goals and two of her long term goals. (LTG 1 & 4)
- She made significant progress towards her two unmet long term goals (LTG 2 & 3)
- She was able to complete ADLs, as well as transfers with modified independence and increased time.
- Due to cognitive changes and increased confusion, there was concern for her safety with return to independent living.
- Discharged to home with 24 hours of assistance provided by a private nursing company and her family
- Discharged with a 4WW for use in the community to increase stability and safety with ambulation
- She was able to participate in all of her prior activities, although she was unable to return to her prior level of independence in those activities.
- She increased her strength, activity tolerance, and ability to activate and sustain contractions of left lateral trunk flexors; however, she continued to experience increased fatigue in the left sided musculature compared to the right.

Discussion

Physical therapy has the potential to make significant improvements in a patient's overall function following a stroke. With proper muscular facilitation techniques it is possible that patients may make even greater gains during their time in rehabilitation

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