

Outcomes of an Intensive Amplitude-Specific Therapeutic Approach for Patients with Parkinson's Disease

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Purpose: The purpose of this abstract is to describe functional outcomes of an amplitude-specific therapeutic approach in patients with Parkinson's disease (PD).

Background: Evidence suggests that exercise can modify disease progression in patients with PD and contribute to behavioral recovery and neurochemical sparing.¹⁻³ Exercise that is high intensity/amplitude and repetitive has been shown to improve function in individuals with PD.¹ Behavioral recovery, a hallmark of neuroplastic-based interventions, is based on repetitive actions designed to prevent or reverse learned non-use. The intervention provided was based on strategies used in speech therapy for people with PD (Lee Silverman Voice Treatment [LSVT®] LOUD).¹ There is evidence to support that intensive, high effort, amplitude training taught with self-monitoring of vocal loudness results in improvements in loudness and speech intelligibility.⁹ These strategies are used for limb movement (LSVT "BIG") with a standardized approach and a focus on amplitude, reducing cognitive load and allowing intense focus on this aspect of movement. BIG intervention targets bradykinesia/hypokinesia by increasing amplitude of movement, sensory calibration, intensity of effort, and empowerment. The goal is to recalibrate perception of normal movement.

Subjects: Nineteen patients (14 men, 5 women) with mean age 67.21 years (sd 8.53; median 66.5), Hoehn and Yahr 1-4, were treated in an outpatient PT clinic by LSVT BIG certified therapists 4 times a week for 4 weeks; avg. # visits 17 (sd 2.40, median 17); avg. length of stay (LOS) 33.84 days (sd 10.36, median 32.5). Sessions lasted 45 to 60 minutes. Seven daily exercises focused on whole body movements. Movements were performed at the individuals' maximum effort. Patients were cued to move as "big" as they could with each exercise. Gradually external cues were reduced. Functional tasks focused on self-reported difficult everyday movements. Hierarchical tasks added to functional tasks by including an extra step. The complexity of the functional tasks and hierarchical tasks were increased as patients improved.

Outcome: Berg Balance Scale scores improved from 47.84 (sd 7.68) to 54.36 (sd 2.63), indicating a genuine change in function had occurred.¹¹ Timed Up and Go (TUG) improved from 13.76 sec (sd 13.48) to 8.27 sec (sd 7.08). Norms for individuals aged 60-69 are 8.1 seconds (sd 1.0) indicating that subjects fell within this range at discharge.¹² Gait speed increased from 0.96 m/s (sd 0.24) to 1.31 m/s (sd 0.25), an improvement of 0.35 m/s (comfortable pace) and from 1.39 m/s (sd 0.44) to 1.73 m/s (sd 0.31), an improvement of 0.34 m/s (fast pace). A meaningful change for older adults has been defined as 0.10 m/s.¹⁴ At discharge, subjects were ambulating at usual adult walking speed of 1.2-1.3 m/s.¹⁵ For the fast pace, subjects scored above the 95th percentile for their age group (65-74) at discharge.¹⁶ Forward Functional Reach on admission was 7.95" (sd 2.18). Scores between 6-10" indicate patients are twice as likely to have >1 fall in the next 6 months.¹⁷ Subjects came out of this risk group at discharge (12.74" [sd 1.92]) and approached age and gender-based norms.¹⁷ The Reedco's Posture Score is a measure of variance from normal observed posture (100 points).¹⁸ Any improvement signifies improved observed posture. Subjects improved 21.12 points on this tool. Patients in this protocol improved in a clinically meaningful way on every measure used.

Conclusion: This outcome study indicates that amplitude-specific therapeutic approaches used by trained physical therapists may have positive effects on function.