



# **Intensive voice treatment (the Lee Silverman Voice Treatment- LSVT® LOUD-) for individuals with Wilson's disease and adult cerebral palsy: two case reports**

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## Introduction

- LSVT® LOUD is a standardized speech treatment with strong evidence supporting its effectiveness in improving speech difficulties in Parkinson's disease.
- Positive outcomes have also been reported in other neurological conditions, including stroke, traumatic brain injury, multiple sclerosis, ataxia, Down syndrome, and Parkinson-plus syndromes.
- Although originally developed for vocal weakness in Parkinson's disease, its broader effects suggest benefits beyond this population.



## Introduction-cont.

- In this study, LSVT® LOUD. was selected to address the participants' speech characteristics, including reduced loudness, monotone voice, pitch breaks, imprecise consonants, and disrupted speech rhythm.
- Previous studies in individuals with ataxic and spastic dysarthria have shown improvements in voice, articulation, intelligibility, and communication after treatment.
- Based on this evidence, we applied LSVT® LOUD in these two cases and hypothesized that training normal loudness would lead to broader improvements in speech.



## Objectives and Methods

- This case report aimed to examine the effects of an intensive voice intervention, Lee Silverman Voice Treatment (LSVT® LOUD), in individuals with Wilson's disease (WD) and adult cerebral palsy (CP) presenting with dysarthria.
- Two participants received LSVT® LOUD therapy four times per week for four weeks.
- Acoustic and perceptual voice analyses were conducted before and after treatment; acoustic measures included fundamental frequency (Hz), jitter (%), shimmer (%), and harmonics-to-noise ratio (HNR, dB). Perceptual voice quality was assessed using the Grade, Roughness, Breathiness, Asthenia, Strain (GRBAS) scale.
- Voice-related self-perception was evaluated using the Voice Handicap Index (VHI).



## Results

- Post-treatment results demonstrated significant improvements ( $p < .05$ ) in fundamental frequency, jitter, and shimmer values for both participants, with the exception of HNR values in the participant with WD.
- Both participants showed significant increases ( $p < .05$ ) in the duration (s) and sound pressure level (SPL, dB) of sustained vowel phonation (/a/), as well as significant increases ( $p < .01$ ) in SPL during pitch range tasks (high and low /a/), reading, and conversational speech.
- High-frequency pitch values (Hz) improved in both participants, whereas low-frequency pitch values did not improve in the participant with WD.
- Perceptual GRBAS ratings for sustained vowel phonation and paragraph reading indicated overall improvements in voice quality for both participants.
- Additionally, perceived vocal loudness increased following therapy.



## Conclusions

- These findings provide preliminary evidence that individuals with Wilson's disease and adults with cerebral palsy may respond positively to intensive speech treatments such as LSVT® LOUD.
- Further research with larger samples is warranted to establish evidence-based speech intervention protocols specific to WD and adult CP populations.



## References

- Ertan-Schlüter E, Gürvit H, Hanağası H, Bilgiç B, Tunçer M, Yılmaz C. Intensive voice treatment (the Lee Silverman Voice Treatment-LSVT LOUD-) for individuals with Wilson's disease and adult cerebral palsy: two case reports. *Logopedics Phoniatics Vocology*, 2021; 47(4): 262-270.
- Boliek CA, Fox CM. Individual and environmental contributions to treatment outcomes following a neuroplasticity-principled speech treatment (LSVT LOUD) in children with dysarthria secondary to cerebral palsy: a case study review. *J Speech-Lang*. 2014;16(4):372–385.
- Ramig L, Fox C. Voice therapy: clinical case studies: use of LSVT LOUD (Lee Silverman voice treatment) in the care of a patient with Parkinson disease. San Diego (CA): Plural Publishing; 2019.
- Lowit A, Egan A, Hadjivassiliou M. Feasibility and acceptability of Lee Silverman voice treatment in progressive Ataxias. *Cerebellum*. 2020;19(5):701–714.
- Boliek CA, Fox CM. Therapeutic effects of intensive voice treatment (LSVT LOUDV R ) for children with spastic cerebral palsy and dysarthria: a phase I treatment validation study. *Int J Speech Lang Pathol*. 2017;19(6):601–615.