





*Suzuki et al. (2013)*: This single-subject study involves a 61-year-old male Japanese speaker with a diagnosis of PD, who developed palilalia subsequent to implantation of a deep brain stimulator. It uses perceptual measures of intelligibility as an indicator of progress. Sixteen features<sup>1</sup> of the client's speech were rated on a 0-4 scale ("0" being normal; "4" being severely abnormal) by three independent speech-language pathologists, and the average ratings were reported for each feature. Treatment included the LSVT protocol and pacing board training. Perceptual ratings were carried out under three conditions: before treatment, after 16 sessions of LSVT, and after treatment with a pacing board. Prior to treatment, the most disordered features were impaired loudness (rated as 1), rough hoarseness (rated as 1.5) abnormality of utterance speed (rated as 2), changes in utterance speed (rated as 1.5) and repetitive speech phenomena (rated as 3). After 16 sessions of LSVT, all of these features had improved somewhat, however rough hoarseness, abnormality of utterance speed, and changes in utterance speech continued to be rated mildly abnormal (both rated as 1), and repetitive speech phenomena was rated moderately abnormal (with a rating of 2). After

### Procedures

The participant completed a total of 22 therapy sessions, which included eight 60-minute LSVT-only sessions, eight 60-minute LSVT+pacing therapy sessions, and six 60-minute sessions of exclusively pacing therapy.

### Objective measures

*Repetitive speech:* A spontaneous monologue sample was recorded pre- and post- intervention, and the number of partial and whole word repetitions was counted (Rep/M). Rep/M was also determined for each intervention session based on a set of 10 client-generated utterances pertaining to daily life.

## Discussion

During this course of treatment, the client received a combination of LSVT and pacing therapy. In the LSVT-only condition, modest improvements were observed in both dB SPL and Rep/M, and a pacing board was introduced when palilalic repetitions severely hindered the client's ability to produce functional speech. The pacing board resulted in immediate reduction of Rep/M, however speech intensity initially dropped below pre-treatment baseline. During the LSVT+pacing condition, intensity levels recovered, and Rep/M decreased sharply. Finally, the pacing-only condition resulted in even greater reductions in Rep/M. Though the relative contributions of intensity and Rep/M to intelligibility are unclear, pre-post perceptual intelligibility ratings suggest a marked improvement in

*Neurology, Neurosurgery, and Psychiatry*, 52  
805–807.

- Adams, S. G. (1994) Accelerating speech in a case of hypokinetic dysarthria: descriptions and treatment. In J. Till, K. Yorkston, & D. Beukelman (Eds.), *Motor speech disorders: advances in assessment and treatment*. Baltimore, MD: Paul H. Brookes. Pp. 213-228.
- Benke, T. H., Hohenstein, C., Poewe, W., & Butterworth, B. (2000). Repetitive speech phenomena in Parkinson's disease. *Journal of Neurology, Neurosurgery & Psychiatry*, 69(3), 319-324.
- Beukelman, D. R., & Yorkston, K. (1977). A communication system for the severely dysarthric speaker with an intact language

