Use of Smartwatch Technology for People with Dysarthria*

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Purpose: Dysarthria is caused by a variety of neurological diagnoses resulting in decreased communicative effectiveness. Treatment of dysarthria could be improved if speech-language pathologists (SLPs) had the ability to obtain speech data during exercises and typical daily activities outside the clinic. This study evaluated the feasibility of smartwatch technology to collect reliable speech data in ecologically valid environments outside of the clinical environment.

Methods: Six people with hypokinetic dysarthria secondary to PD were recruited for this study, three men and three women. The length of the study was four weeks. Participants were randomized to use the smartwatch in weeks 1 and 3 or weeks 2 and 4 to allow comparison of exercises with and without the smartwatch technology. Participants completed voice and speech exercises twice each day consisting of sustained "ah", high and low pitch exercises, reading sentences aloud, and one functional speech task. Participants also completed questionnaires to assess their experience using the smartwatch. Results: Vocal intensity and pitch data were successfully obtained from the smartwatch during the field trial. Five of the six participants reported they completed their exercises more frequently during the trial with the smartwatch. Three participants indicated they would use the system regularly if it was available and three reported they would use it periodically. Five of the six participants found the smartwatch technology very easy or easy to use.

Discussion: Our previous research established proof of concept for the use of a smartwatch in the clinic for individual and group speech data collection. Results of the current study demonstrated the system collected accurate and reliable data when used outside the clinical setting in a field trial. Future research should incorporate the smartwatch in a treatment regimen to evaluate whether SLPs can use the system to improve treatment outcomes.