

Critical Review:

The Effect of Expiratory Muscle Strength Training (EMST) on Dysphagia in individuals with Idiopathic Parkinson's disease.

Natasha Bouchard

M.Cl.Sc (SLP) Candidate

University of Western Ontario: School of Communication Sciences Disorders

The current critical review investigates the impact of Expiratory Muscle Strength Training (EMST) on Dysphagia in individuals with idiopathic Parkinson's disease, as well as the clinical implications of the effects. Study designs evaluated in this review include two randomized, controlled clinical trial designs.

protection capability (Sapienza, Wheeler, 2006). This increase in muscle force generation has been associated with not only increased cough generation, but also increased laryngeal elevation, and therefore increased swallowing safety (Troche et al., 2010). Of particular importance is the potential relationship between expiratory muscle function and dysphagia in individuals with PD.

### Objectives

The primary objective of the current paper is to critically evaluate the existing literature related to the effect of Expiratory Muscle Strength Training (EMST) on dysphagia in individuals with PD.

### Methods

#### Search Strategy

The sources for this paper were collected using the following computerized databases: Pubmed, Psych Info, Medline, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). The following search strategies were employed:

[Expiratory Muscle Strength Training], OR [muscle strength training], OR [EMST] OR [Respiratory Strength Training] AND [Parkinson's Disease], AND [dysphagia], OR [swallowing], OR [aspiration].

#### Selection Criteria

Inclusion criteria for the selection of research to be included in the current review was as follows; the articles had to be written and/or published in English, and they had to involve an investigation of the effects of Expiratory Muscle Strength Training on dysphagia or swallowing disturbances in Parkinson's patients. No limits of publication year, or geographical demographics were placed.

#### Data Collection and Analysis

The outcome of the literature search yielded 1 qualitative and 3 quantitative studies that matched the aforementioned search criteria, they are as follows; randomized, sham controlled clinical trials (2), non-randomized, within groups, pretest/posttest studies (1), and single subject repeated measures studies (1). The relative strength of the evidence presented by each study was determined through the analysis of their research

This study by Sapienza and colleagues (2011) is judged to represent a level I research design according to Archibald's (2013) system for the evaluation of research designs. The Sapienza et al (2011) study yielded important clinical findings. Following 4-weeks of EMST, individuals with PD showed significantly increased MEP values, and thus voluntary control of expiratory muscles. There are several limitations to current study. First, only individuals with moderate clinical disability were included, which is a fairly limited representation of this clinical population. Second, no assessment of swallowing function was performed. Finally, the study population had a very small proportion of females (n: 47; f: 13) relative to the typical population. This study did however have many strengths including; a large sample size, pre-post measurements that were obtained during stable medication states, strict inclusion criteria, exclusion of participants with cognitive impairments and age equivalence across the treatment and sham groups. The results then, provide restrictive and limited support for the use of EMST for dysphagia in individuals with PD, but strong support for EMST on Maximum Expiratory Pressure changes in PD.

Saleem, Sapienza, and Olanow (2005) level I study involved a single subject repeated measures design, and examined the effects of 4-weeks of EMST on the generation of maximum expiratory pressure. They hypothesized that 4-weeks of EMST would yield a strengthening of expiratory muscles in the same way that strength training targets weakness of limb muscles in the Parkinson population.

The participant in this study was a 54-year-old female with tremor-dominant idiopathic Parkinson's disease and disease duration of 5 years. Two baseline measure sessions were carried out one week apart, followed by a 4-week EMST program. Post-treatment measures were completed in the seventh week. Due to self-perceived functional gains, the participant requested that the program be extended. The program was extended for an additional 16 weeks of EMST, and post-treatment data was collected again following a 4-week





Michou, E., & Hamdy, S. (2010). Dysphagia in