

Disclaimer: This document is not intended to provide definitive guidance on diagnosis and treatment of patients with Parkinson's Disease. It provides clinicians with general information on certain disease processes that may assist in clinical decision making. Specifically, Empi/VitalStim has not requested nor received specific clearance from the US FDA for the use of NMES for dysphagia in this patient population. Clinicians are advised to consult the professional literature for information specific to that condition and use best practice guidelines in determining treatment intervention.

### Description

Parkinson's Disease (PD) is a chronic and progressive disease of the motor system that results in difficulty initiating and controlling rate and accuracy of movement.

### Pathophysiology and Presentation

PD occurs when a group of cells in part of the mid-brain, the substantia nigra, begin to malfunction and die. These cells produce dopamine which is a neurotransmitter responsible for the brain's control of movement and coordination. As the messages from the brain telling the body how and when to move are decreased, the person becomes incapable of initiating and controlling movements in a normal way.<sup>1</sup>

It has a gradual onset, slowly progressing to eventual severe disability.

Symptoms of PD include bradykinesia (slowing of movement, difficulty initiating), rigidity, tremor, postural instability, loss of dexterity, gait disturbance, depression, nervousness, psychiatric disturbance, speech disturbances, and dysphagia.<sup>3</sup> Patients can also suffer from central fatigue (cortical or mental fatigue, decreased outflow to motor impulses).

### Typical dysphagia dysfunction

Oral: Drooling, piecemeal deglutition, tongue pumping, slow oral transit, premature loss of bolus.

Pharyngeal: Delay in initiating a swallow, reduced pharyngeal squeeze, decreased laryngeal elevation, incomplete laryngeal closure.

Esophageal: Reduced peristalsis, poor timing of UES opening, CP spasm

### Management

Basic treatment of PD has typically involved dopamine replacement using Levodopa (Sinemet®).<sup>1</sup> A newer treatment for patients that do not respond to medication involves the placement of a deep brain stimulator (DBS). A DBS blocks electrical signals that cause Parkinson's Disease from certain parts of the brain.<sup>4</sup>

Management of dysphagia: Typically patients in the earlier stages of this disease respond best to treatment efforts. Treatment consists of the following:

1. Modification of food/fluid consistency and quantity
2. Recommend small, frequent, highly nutritious meals
3. Exercise for strengthening of weak muscles (due to dyscoordinated movements).  
Patients may require more frequent rest breaks during the session.

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4. Adjust the level of treatment intensity to meet the changing energy levels that may occur within a session or from session to session.<sup>2</sup>
5. Biofeedback may be used in an effort to minimize extraneous movements (such as tongue pumping).
6. The Lee Silverman Voice Treatment (LSVT) program has also proven beneficial for swallowing with PD patients.<sup>5</sup>

**Role of NMES:** Electrical stimulation may be used to improve muscle strength which may assist with coordination of swallowing musculature and maintaining functioning. This may delay PEG placement. Treatment tends to be most effective with individuals who have mild to moderate PD.

### Literature review

While there are numerous published articles about dysphagia and PD, there are very few about dysphagia, PD, and exercise. Information from the PT literature provides information about the possible benefits and effects of exercise with PD in general.

- Crizzle AM, Newhouse IJ. **Is physical exercise beneficial for persons with Parkinson's disease?** *Clin J Sport Med* 16(5):422-5 (2006).

Findings: The authors reviewed existing studies evaluating the effectiveness of physical exercise for sufferers of Parkinson's disease. Seven studies were selected that met set criteria. All studies reviewed show that exercise improves overall performance in PD. Improvements were measured using standardized tests and other measurement scales.

- Dibble LE, Hale T, Marcus RL, Gerber JP, Lastayo PC. **The Safety and feasibility of high-force eccentric resistance exercise in persons with Parkinson's disease.** *Arch Phys Med Rehabil* 87(9): 1280-2 (2006).

Findings: 10 persons with PD trained 3 days/week for 12 weeks performing high-force eccentric resistance exercise with lower extremities. No indication of muscle damage was reported at any time. The authors concluded that persons with mild to moderate PD can safely and feasibly participate in high-force eccentric resistance training.

### References

1. Parkinson's Disease: An Overview. Parkinson's Disease Foundation, 2008. [www.pdf.org](http://www.pdf.org)
2. Parkinson's Disease. Medical Encyclopedia, Medline Plus. May 10, 2007. <http://www.nlm.nih.gov/medlineplus/ency/article/000755.htm#Definition>
3. Parkinson Primer. National Parkinson Foundation. [www.parkinson.org](http://www.parkinson.org)

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4. NINDS Deep Brain Stimulation for Parkinson's Disease Information Page. National Institute of Neurological Disorders and Stroke. December 11, 2007.  
[http://www.ninds.nih.gov/disorders/deep\\_brain\\_stimulation/deep\\_brain\\_stimulation.htm](http://www.ninds.nih.gov/disorders/deep_brain_stimulation/deep_brain_stimulation.htm)
5. Sharkawi A El, Ramig L, Logemann JA, Pauloski BR, Rademaker AW, Smith CH, Baum S, Werner C. Swallowing and voice effects of Lee Silverman Voice Treatment (LSVT®): a pilot study. *Journal of Neurology Neurosurgery and Psychiatry* 2002;72:31-36