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Dr. Emily Plowman Awarded Three-Year NIH Grant to Study Neural Mechanisms of Swallowing Dysfunction in Parkinson's Disease

Parkinson's Disease (PD) is a chronic, progressive and non-curable neurodegenerative disease associated with substantial morbidity, increased mortality and high economic burden (Weintraub et al., 2008). Approximately 1.5 million Americans are currently diagnosed with PD at a cost of \$23 billion dollars annually (Weintraub et al., 2008) and a three to four fold increase in disease rate is expected to occur over the next ten years (Tanner & Ben-Shlomo, 1999). Although impairments in gross motor function such as gait and upper extremity movement are the most common deficits associated with PD, swallowing impairments are reported to occur in 90% of individuals with PD (Sapir et al., 2008) and have been associated with significant reductions in quality of life, social interactions and mental wellbeing (Plowman-Prine et al., 2009a). Further, aspiration pneumonia (a consequence of swallow dysfunction) represents the leading cause of death in PD (Hely et al., 2008).

Current medical interventions for PD include levodopa replacement therapy and deep brain stimulation of basal ganglia structures. While these pharmacological and surgical interventions have been efficacious at alleviating general limb motor symptoms, they have failed to provide consistent and significant benefit for swallowing dysfunction in PD (Krack et al., 2003; Plowman-Prine et al., 2009b, Rousseaux et al., 2004; Schulz & Grant, 2000). This suggests that cranial nerve and limb deficits are mediated by different underlying neural pathologies. The nature of these differences, however, is uncertain.

Dr. Plowman has received a three-year grant from the National Institute of Health to investigate differences in the neural mechanisms mediating limb and cranial motor impairments in an animal model of PD and to test novel behavioral and pharmacologic rehabilitation for swallowing dysfunction. The results have the potential to guide the development of innovative therapies for PD. More effective treatment strategies of swallowing dysfunction will improve patient quality of life, reduce individual health care cost, aspiration pneumonia and ultimately morbidity in this disease population.



Emily Plowman, PhD