

Drug-induced Parkinsonism (DIP): A canary in the coal mine?

DIP associated with dopamine receptor blocking drugs (most often antipsychotics) is the second most common cause of Parkinsonism and can be clinically indistinguishable from PD. In some cases, when symptoms persist after drug withdrawal, DIP may represent “unmasking” of prodromal PD-with the offending drugs acting as a “stress test” for dopaminergic pathways. In two studies funded by a VISN 4 pilot award, we found that hyposmia, severe non-motor symptoms or the appearance of DIP with low-intensity dopamine blockers may signal underlying neurodegeneration. We are continuing to study the relationship between DIP and underlying PD using clinical and radiologic biomarkers.

The Immune System and Parkinson’s Disease

Dr. Morley and the PADRECC are collaborating with a local biotech company (Longevity Biotech) on a project recently funded by the Michael J. Fox Foundation to study whether the immune system plays a role in PD. The team will recruit *pairs of patients and their caregivers* to study whether immune cells and other blood markers are different in PD and are associated with disease severity or other PD characteristics. This study will begin recruiting subjects in June 2018.

Bacteria and Parkinson’s Disease

Dr. Fullard and Dr. Duda, in collaboration with Dr. Noam Cohen from the Ear Nose and Throat Department, continue to study how bacteria that colonize our body might contribute to the risk of Parkinson's disease. This study is trying to understand if there are genetic reasons why some people **with PD** have certain types of bacteria in the hopes of developing new therapies in the future. Once recruitment is complete, we will examine differences in the genetics of the taste receptors and in the bacteria of the nose and gut between those with Parkinson’s disease and those without.

Traumatic Brain Injury

Dr. John Duda, PADRECC Director and his colleagues, Drs. Kacy Cullen, Isaac Chen and John Wolf, from the Department of Neurosurgery at the University of Pennsylvania, continue studies funded by the Rehabilitation Research and Development Service of the Department of Veterans Affairs to study the relationship between brain trauma and neurodegeneration. The researchers have published several studies that have shown how the brain reacts to trauma and how that could possibly lead to chronic neurodegenerative disease development. It is hoped that these studies will lead to treatments to prevent the development of these neurodegenerative diseases in Veterans and others who have suffered head injuries.

Neurorestoration in Parkinson’s Disease

Dr. John Duda and his colleagues Kacy Cullen, PhD, and Isaac Chen, MD, PhD from the Center for Neurotrauma, Neurodegeneration, and Restoration (CNNR) at the Crescenz VA Medical Center, continue to investigate whether one of the main brain pathways affected in Parkinson’s disease, the nigrostriatal pathway, can be generated in a petri dish and transplanted in animal models to reverse the motor symptoms in PD. While studies are early, the success of their efforts to date have led to several publications and special recognition at several different scientific meetings.

Exercise in PD

Identifying early or prodromal PD that has been “unmasked” by DIP allows intervention at the earliest stages of disease. Dr. Morley continues his VA Rehabilitation R&D service Career Development Award entitled “**Effect of exercise on recovery in drug-induced Parkinsonism and Parkinson disease.**” Subjects with suspected DIP who are found to have abnormal DAT-SPECT are randomized to exercise (aerobic walking) or no intervention. We are examining the short term effects of exercise after 8 weeks and a potential disease modifying effect of exercise using serial DAT-SPECT and biochemical markers after 52 weeks.

If exercise can benefit our PD patients, how can we make sure they are getting enough? Dr. Sneha Mantri, PADRECC fellow, is finishing a study to better understand exercise and activity levels in PD. She is examining PD patients’ attitudes and barriers to exercise and comparing them to activity levels using both a self-reported survey and objective monitoring in the community using wearable devices. Dr. Mantri hopes to use this information to identify potential interventions to increase exercise and activity levels in PD patients.