

What's Hot in Parkinson's Disease Column
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Breaking a Sweat: Is Exercise On Its Way Back Into the Armamentarium for Treatment and Protection Against Parkinson's Disease?

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Many years before adequate medication treatments were developed to address the symptoms of Parkinson's disease, some doctors recommended exercise, staying busy, and when engaging in activities being as "physical" as possible. There are stories of institutionalized Parkinson's disease patients (prior to the levodopa era) who were asked to push the chart cart for doctors on rounds, or to fold towels for hospital staff. Early observations about improvement in Parkinson's disease patients following task specific physical exertion have contributed to the belief that exercise may be beneficial. For years in my own practice, I have expressed to patients that exercise is "like a drug," and that a daily stretching and exercise routine may be of significant benefit. I have also noticed that patients who receive physical therapy the hour prior to their appointment with me, seem brighter and more optimistic. Though, I personally believe in exercise for Parkinson's sufferers, we have until now, lacked a strong scientific rationale to prescribe it.

Smith and Zigmond reviewed the topic of whether exercise could be neuroprotective or disease modifying in Parkinson's disease in article in *Experimental Neurology*. These investigators began studying the effects of exercise in a 6-hydroxydopamine model of Parkinson's disease in the animal. Forced exercise in their animals seemed to reduce their vulnerability to developing Parkinson's disease symptoms. They speculated that exercise increased certain chemicals in the brain called trophic factors, and this change may have resulted in protection of brain cells (Smith and Zigmond 2003).

Beth Fisher and colleagues have now moved their research group's recent observations on exercise and Parkinson's disease from an animal model into a human study. Published in July 2008 in the *Archives of Physical Medicine and Rehabilitation*, this group aimed to "obtain preliminary data on the effects of high-intensity exercise on functional performance in people with Parkinson's disease." They also wanted to determine whether improved performance was accompanied by positive physiological alterations in the brain. In this study there was a small improvement in the motor subscale for Parkinson's disease (called the UPDRS). More importantly though, "the high-intensity group of subjects showed post-exercise increases in gait speed, step and stride length, and hip and ankle joint excursion during self-selected and fast gait and improved weight distribution during sit-to-stand tasks. Improvements in gait and sit-to-stand measures were not consistently observed in low- and zero-intensity exercise groups. The high-intensity group also revealed positive physiological changes in the brain." The findings were supportive of symptomatic benefits, particularly with high intensity

exercise. Perhaps we should be telling our patients that regardless of the exercise program, they need to break a sweat!

Canning, Murray and colleagues reported in the January issue of the Journal BMC Neurology their intentions of performing a randomized study of fall prevention in Parkinson's disease utilizing exercise as their intervention. "The main objective of this randomized controlled trial (of 230 patients) will be to determine whether fall rates can be reduced in people with Parkinson's disease using exercise-- targeting three potentially remediable risk factors for falls (reduced balance, reduced leg muscle strength and freezing of gait). In addition we will establish the cost effectiveness of the exercise program from the health provider's perspective." Participants will be randomly allocated to a usual-care control group or an intervention group which will undertake weight-bearing balance and strengthening exercises and use cueing strategies to address freezing of gait. The intervention group will choose between the home-based or support group-based modes of the program(Canning, Sherrington et al. 2009)." This large study will address symptomatic benefits of exercise, especially with falling.

Nowadays in Parkinson's practices all over the world, exercise is being prescribed more and more. The evidence trail seems to be pointing toward beneficial effects, but more studies are needed. Hopefully these studies will reveal to us what kind of exercise, at what intensity, and at what frequency will be best. Although many practitioners believe that prescribing exercise earlier in the course of Parkinson's disease may yield disease modifying or neuroprotective benefits, this remains unknown (Fisher, Wu et al. 2008). Exercise seems to offer the possibility of both motor and non-motor benefits, as well as general health benefits--- it is therefore reasonable to consider a daily exercise program but remember, if you don't break a sweat it probably doesn't count as exercise!

Selected References

- Canning, C. G., C. Sherrington, et al. (2009). "Exercise therapy for prevention of falls in people with Parkinson's disease: A protocol for a randomised controlled trial and economic evaluation." BMC Neurol **9**(1): 4.
- Fisher, B. E., A. D. Wu, et al. (2008). "The effect of exercise training in improving motor performance and corticomotor excitability in people with early Parkinson's disease." Arch Phys Med Rehabil **89**(7): 1221-9.
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