

# High-intensity exercise delays Parkinson's progression

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Immunohistochemistry for alpha-synuclein showing positive staining (brown) of an intraneural Lewy-body in the Substantia nigra in Parkinson's disease. Credit: Wikipedia

High-intensity exercise three times a week is safe for individuals with

early-stage Parkinson's disease and decreases worsening of motor symptoms, according to a new phase 2, multi-site trial led by Northwestern Medicine and University of Denver scientists.

This is the first time scientists have tested the effects of high-intensity [exercise](#) on patients with Parkinson's disease, the second most common neurodegenerative disorder and the most common movement disorder, affecting more than a million people in the United States.

It previously had been thought high-intensity exercise was too physically stressful for individuals with Parkinson's disease.

The paper will be published in *JAMA Neurology* Dec. 11, 2017.

Parkinson's symptoms include progressive loss of muscle control, trembling, stiffness, slowness and impaired balance. As the disease progresses, it may become difficult to walk, talk and complete simple tasks. Most people who develop Parkinson's are 60 and older.

"If you have Parkinson's disease and you want to delay the progression of your symptoms, you should exercise three times a week with your heart rate between 80 to 85 percent maximum. It is that simple," said co-lead author Daniel Corcos, professor of physical therapy and human movement sciences at Northwestern University Feinberg School of Medicine.

Because medications for Parkinson's have adverse side effects and reduced effectiveness over time, new treatments are needed.

The randomized clinical trial included 128 participants ages 40 to 80 years old from Northwestern University, Rush University Medical Center, the University of Colorado and the University of Pittsburgh.

Participants enrolled in the Study in Parkinson Disease of Exercise (SPARX) were at an early stage of the disease and not taking Parkinson's medication, ensuring the results of the study were related to the exercise and not affected by medication.

"The earlier in the disease you intervene, the more likely it is you can prevent the progression of the disease," Corcos said. "We delayed worsening of symptoms for six months; whether we can prevent progression any longer than six months will require further study."

Scientists examined the safety and effects of exercise three times weekly for six months at high intensity, 80 to 85 percent of maximum heart rate, and moderate intensity, 60 to 65 percent of maximum heart rate. They compared the results to a control group who did not exercise.

After six months, participants were rated by clinicians on a Parkinson's disease scale ranging from 0 to 108. The higher the number, the more severe the symptoms.

Participants in the study had a score of about 20 before exercise. Those in the high intensity group stayed at 20. The group with [moderate exercise](#) got worse by 1.5 points. The group that did not exercise worsened by three points. Three points out of a score of 20 points is a 15 percent change in the primary signs of the disease and considered clinically important to patients. It makes a difference in their quality of life.

"We are stopping people from getting worse, which is significant, particularly if we catch them early in the disease," Corcos said.

What sets this study apart from others is the high number of participants, and that they exercised for a relatively long period of time. Most exercise studies are 12 weeks, Corcos said.

"We gave them a proper workout," Corcos said. "This is not mild stretching. This is high intensity. It's part of the idea that exercise is medicine."

Corcos and colleagues confirmed it was safe for the participants to do high-intensity exercise by giving them a cardiologist-supervised graded exercise test to evaluate the heart's response to exercise.

Previous studies in humans suggest [high-intensity](#) exercise improves motor symptoms, but the evidence wasn't sufficient to determine whether [exercise intensity](#) modifies symptoms or disease progression. In addition, most studies have not precisely measured or controlled exercise intensity and none have been conducted at 80 to 85 percent [maximum heart rate](#).

"Several lines of evidence point to a beneficial effect of exercise in Parkinson's disease," said Dr. Codrin Lungu, program director at the National Institute of Neurological Disorders and Stroke. "Nevertheless, it's not clear which kind of exercise is most effective. The SPARX trial tries to rigorously address this issue. The results are interesting and warrant further exploration of the optimal exercise regimes for Parkinson's."

Provided by Northwestern University

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