

Finding the proper dose

Study Takes another Run at Exercise Benefits for Parkinson's Patients

By Tyler Smith

Can moving more help people with Parkinson's disease, a movement disorder? And if it can, how much movement – and at what intensity – is safe and effective?

These are among the questions to be answered by a clinical trial now underway at the University of Colorado Denver Anschutz Medical Campus. The SPARX (Study in Parkinson Disease of Exercise) trial seeks to evaluate whether or not different levels of high-intensity exercise improve the symptoms of Parkinson's disease.

The U.S. Food and Drug Administration phase 2 study, funded by the National Institute of Neurological Disorders and Stroke (NINDS), is now enrolling patients in Colorado and at sites in Chicago and Pittsburgh.



For Margaret Schenkman, PT, PhD, director of the Physical Therapy Program at the CU School of Medicine, the SPARX trial continues 25 years of research into how exercise might slow the progression of Parkinson's disease.

None, some, or a lot. The SPARX trial divides enrollees into three groups. For a period of six months, the control group does no exercise. A second group performs "moderate" endurance exercise

at 60 to 65 percent of maximum heart rate four times a week for six months. The third group performs "vigorous" exercise – 80 to 85 percent of maximum heart rate – following the same six-month regimen as the second group. All participants are invited to continue to exercise for an additional six months after the trial period.

At the end of the trial, researchers will use the Unified Parkinson's Disease Rating Scale (UPDRS) to evaluate the progression of the disease in each of the three groups, said Margaret Schenkman, PT, PhD, director of the Physical Therapy Program at the CU School of Medicine, and principal investigator for the study in Colorado.

"We want to see if people with Parkinson's can do high-intensity exercise safely and with no adverse events beyond the ordinary ones, such as occasional soreness, that would be expected with exercise," Schenkman said.

The larger question, however, is whether the UPDRS scores in one or both of the exercise groups are sufficiently superior to those in the no-exercise group to justify moving on to the next study.

Brain gain. In the past 25 years, Schenkman and other researchers have produced studies demonstrating that varieties of exercise can alleviate symptoms of the disease and improve quality of life.

"Our clinical impression is that people who exercise are not declining at the rate we expected," Schenkman said.

The long-term goal, however, is to determine whether vigorous exercise produces positive changes in the brains of people with Parkinson's disease.

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Interest in that question expanded about a decade ago, Schenkman said, when neurophysiologists began looking into the question of whether exercise could protect brains from the ravages of neurologic disease. Animal studies suggested vigorous exercise could help to shield the brain from neurotoxins linked to Parkinson's disease and improve cognition. Human studies, meanwhile, demonstrated that exercise improved cognition and slowed memory loss in individuals with Alzheimer's disease.

Schenkman was eager to follow those promising study paths with colleagues Anthony Delitto from the University of Pittsburgh; Daniel Corcos from the University of Illinois-Chicago; and Deborah Hall from Rush Medical Center in Chicago.

"We wanted to look at exercise and neuro-protection in people with Parkinson's and pitched the idea to the National Institutes of Health," Schenkman said. But the NIH considered the idea very expensive and encouraged the group to begin with the proposal that became the SPARX trial, she explained.

"We want to know if the exercise is safe, if patients can do it three to four times a week and if one of the two intensities is different than doing no exercise at all," Schenkman said. "Once we have those data, we can look at the brains of people with Parkinson's. Do brain changes occur less quickly if they exercise?"

Moving targets. The study has thus far enrolled 75 people with Parkinson's, with a goal of 126 by the time the study concludes, probably in August of 2015, Schenkman said. It's somewhat slow going, she said, because enrollees can't be on medications during the trial. But the net is wide. At University of Colorado Hospital, neurologists Maureen Leehey, MD; Benzi Kluger, MD; and Brian Berman, MD, have referred patients, while community physicians in Fort Collins, Colorado Springs, Boulder, and other cities have also participated.

Enrollees wear heart rate and activity monitors from which researchers download data for the study. Some people use the Exercise Research Lab on the third floor of UCH's Leprino Building for the required activity, while others work from home or community centers, Schenkman said. The process makes some demands on participants, but almost none have dropped out during their six-month stints, she said.

More than two decades since launching her research, Schenkman said it's satisfying to see the growing recognition in the medical and research communities that exercise can play an important role in helping people manage Parkinson's disease.



An exercise class for people with Parkinson's disease led by UCH physical therapists at the Anschutz Health and Wellness Center in April 2013.

"It's a piece of the solution," she said. "It can help people live with the disease and maintain their ability to function."

But the SPARX trial, she added, aims to sharpen understanding of the benefits of exercise in treating Parkinson's. There are no cut-and-dried answers. Duration, intensity, and delivery method – treadmills, boxing, dancing – all can be beneficial, she noted.

"If we are careful to give patients dopamine at the right dose, we should give exercise at the right dose," Schenkman said. "There are lots of different applications. It's helpful if we can give people guidance."

For more information the SPARX trial, contact Toby Wellington at 720-848-6376 or toby.wellington@ucdenver.edu.