

Treating Parkinson's Physical Therapy in PD



The traditional view of how to treat people with neurodegenerative conditions is that exercise has little or no effect, or that it can actually worsen the disease. However, recent research in both humans and animal models suggests that physical therapy — including gait and balance training, resistance training for the lower extremity muscles and regular exercise — can be an important component of an exercise program that may help improve or hold the signs and symptoms of Parkinson's disease (PD) at bay.

Gait and Balance

Gait and balance impairments are cardinal symptoms of PD. If left untreated, impairment can lead to falls, fractures, hospitalization and loss of independence. In fact, roughly 40 percent of nursing home admissions are preceded by a fall, and falls occur more frequently in people with PD than they do among other individuals.

Recently, a large number of studies have focused on improving gait in people with PD through a training exercise known as “cueing.” People with PD sometimes have difficulty generating internal cues to take a step. They may “freeze” while standing or walking, which can cause falls and injuries. External cues, such as providing a cane to trigger a stepping movement, placing horizontal lines on the floor, giving instructional cues (such as asking the person to “take long steps”) or walking to a rhythmic metronome, can all improve stride length and walking velocity, and reduce shuffling and freezing.

In one such study, cueing training was used to improve walking in participants' home environments. The results, though modest, showed measurable improvements in gait and balance, as well as reduced freezing and greater confidence in carrying out functional activities. However, after the training ended, the improvements were gradually lost, reminding us that it is important to continue exercising if those improvements are to be long lasting.

Recent research has also suggested that a person with PD needs to exaggerate his or her effort of movement for it to have the same impact as normal movement in a person without PD.

Improving Strength

Studies have generally shown that exercise improves speech and swallowing, posture, tremor, dexterity, cognition and depression. Other studies have shown that treadmill training, lower extremity resistance and balance training can be effective at improving muscle strength, gait and balance.

There has been considerable interest recently in therapies designed to increase muscle mass, known as “muscle hypertrophy.” Several studies have shown that individuals who improved the size of their muscles also demonstrated improvements in functional activities such as climbing or descending stairs or balancing. Muscles shrink when they are not used and grow with intense resistance training. As we age, we often become more sedentary and muscle loss becomes inevitable — underscoring the need for exercise.

In the late 1980s, studies began to show that older adults — many already in their 80s and 90s, and some of them in nursing homes — could improve strength, muscle bulk and function in response to high-intensity resistance training. Despite this evidence — and because some researchers and therapists believed that resistance training might itself increase muscle stiffness — strengthening was not advised for people with PD out of fear that it might be harmful.

More recent studies have further challenged this view. Results of one study of people with mid-stage PD suggest that high-intensity resistance training results in a six percent increase in muscle volume, 17 percent improvement on how far participants

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could walk in six minutes, and a 22 percent and 13 percent improvement in stair descent and ascent time. In another study, high-intensity resistance training for the lower extremity muscles was found to improve balance and to reduce the occurrence of falls.

While resistance training does pose risks that other types of training do not (e.g., risk of hernias and other musculoskeletal injuries), the risks of not participating in such a program and remaining sedentary are not insignificant.

Animal Studies on Exercise and the PD Brain

In addition to helping with movement, researchers believe that exercise may influence the progression of Parkinson's. While the mechanism for these effects in Parkinson's are poorly understood, researchers are coming to believe that when a person with PD engages in a novel activity such as beginning an exercise program — especially when there are opportunities to interact socially — changes in brain structure and function may result. Most of this research is based on animal models of Parkinson's, but some of the findings may apply to humans.

The timing of training in relation to a PD diagnosis may also be relevant. In a recent series of studies, rats were forced to rely on an impaired forelimb during exercise, while their less impaired forelimb was restricted from movement by a cast. In these studies, animals forced to exercise immediately after a PD lesion demonstrated greater retention of the nerve cells that produce dopamine and less severe symptoms down the road. Rats that began the exercise program later (three to seven days after the PD lesion) fared far worse. They had more pronounced Parkinson's symptoms and showed greater PD-related damage in the brain. In other words, the earlier the training is begun after a diagnosis, the better.

In another animal study, it was shown that exercise (represented by rats running on a wheel) increased the number of new dopamine-producing neurons in rats that exercised as compared to rats that did not. In these animal models of Parkinson's, exercise seems to have a neuroprotective effect on the brain. Studies showing the effect of exercise and physical therapy on the human PD brain struc-

ture and function are forthcoming.

What Does This Mean for People with PD?

If the animal studies are found to hold up in humans, it would appear that early exercise may prevent or delay some disabling aspects of Parkinson's. We will not know this for sure until more human trials have been done. What we do know is that people with PD are advised to begin or continue exercise and therapy after a diagnosis has been made.

A major problem in getting people with PD to exercise is that many health professionals still do not understand the value of exercise. Education of people with Parkinson's and families could certainly improve this situation, as could the availability of health clubs or wellness facilities that are equipped to provide services for special groups, such as people with PD. It is important to ask your doctor for a referral for physical therapy, as it may be essential for coverage from insurance or Medicare.

In addition, motivating older adults to exercise requires skills from the practitioner that are not usually taught in allied health care programs. People with PD often require hands-on guidance during exercise in order to minimize the occurrence of injuries, to stay motivated and to continue with a program. Anyone thinking of beginning an exercise program should consult a physician beforehand.

Both younger and older people living with PD can benefit from physical therapies, or a home-based exercise program. The age of the person and the stage of PD should not be limiting factors in the decision to exercise. The results of studies to date are encouraging and the message to people with PD is clear: look for opportunities to exercise!

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Please contact PDF for a list of the research studies referenced in the article.

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- Falls Prevention
- Nutrition and PD

If you have or believe you have Parkinson's disease, then promptly consult a physician and follow your physician's advice.

This publication is not a substitute for a physician's diagnosis of Parkinson's disease or for a physician's prescription of drugs, treatment or operations for Parkinson's disease.