



AOTA Evidence Briefs

Parkinson's Disease

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

P #8

Physical rehabilitation improves motor performance and functional status of clients with Parkinson's disease

Patti, F., Reggio, A., Nicoletti, F., Sellaroli, T., Deinite, G., & Nicoletti, F. (1996). Effects of rehabilitation therapy on Parkinsonians' disability and functional independence. *Journal of Neurological Rehabilitation, 10*, 223–231.

Level IIB2a

Nonrandomized controlled trial, 2 groups, less than 20 participants per condition, moderate internal validity, high external validity

Why research this topic?

Researchers have proposed that physical rehabilitation (rehabilitation with occupational, physical, and speech therapy) become an integral part of the treatment of clients with Parkinson's disease. However, little is known about the potential benefits of such a program.

What did the researchers do?

To provide information about the role of physical rehabilitation in the care of clients with **idiopathic** (see *Glossary*) Parkinson's disease, Patti and colleagues (1996) from the University of Catania (Italy) conducted two parallel studies. Twenty-eight inpatients at the University's Institute of Neurology participated: 8 in the first study (5 men and 3 women) and 20 in the second (14 men and 6 women). The average ages of the two groups were 61.7 and 67.9 years, respectively, and the average durations of disease were 5.7 and 6.5 years, respectively. Three of the inpatients were in **stage 2** (see *Glossary*) of the disease, 15 were in **stage 3** (see *Glossary*), 8 were in **stage 4** (see *Glossary*), and 2 were in **stage 5** (see *Glossary*). None had dementia. All had idiopathic Parkinson's disease.

In the first study, the researchers examined the effects of physical rehabilitation on the 8 participants, who remained on L-dopa or other drugs for the entire period of the study. The rehabilitation was specifically designed for the needs of each participant. For participants in stage 2, physical rehabilitation focused on correcting and preventing musculoskeletal problems. For participants in stage 3 or higher, physical rehabilitation focused on active and passive movements to control rigidity; enhance gait training; and facilitate use of assistive devices, such as walkers or canes. The rehabilitation, which was delivered by physical, occupational, and speech therapists, lasted for 4 weeks. The occupational therapy portion of the program consisted of instruction in compensatory techniques for performing self-care activities and assistance in choosing assistive devices for accomplishing particular tasks.

In the second study, the researchers tested whether a regular personalized program of physical rehabilitation would improve clinical function in participants with Parkinson's disease. The 20 participants were randomly divided into treatment or control groups whose members were similar in age, gender, and duration of disease. The treatment group received rehabilitation like that delivered to the participants in the first study, plus drug treatment. The control group received drug treatment only.

The outcome areas of interest were *disability* (as measured by the Unified Parkinson's Disease Rating Scale [UPDRS], the Webster Rating Scale [WRS], and the Northwestern University Disability Scale [NUDS]); *activities of daily living* (ADL) (as measured by the Functional Independence Measure [FIM]sm and the Barthel ADL Index); and *motor coordination* (as measured by timed tests of upper- and lower-extremity skills, including speed and amplitude [length] of step). A neurologist evaluated all the participants at baseline; at the end of the program; 2 months after the end of the program; and, in the second study, 5 months after the end of the program. In the second study, the neurologist was unaware of the group assignments.

What did the researchers find?

In the first study, from baseline to the end of the program, the participants showed **significant** (see *Glossary*) reduction in disability (as measured by the UPDRS but not the WRS or the NUDS) and significant improvement in function (as measured by both the FIMsm and the Barthel Index). They also had significantly improved walking speed. However, at the follow-up, they had not sustained these improvements.

In the second study, from baseline to the end of the program, the treatment group showed a significant reduction in disability (as measured by the WRS and the NUDS but not the UPDRS) and significant improvement in function (as measured by the FIMsm but not the Barthel ADL Index). They also had significantly improved walking speed and amplitude of step. The control group showed significant worsening disability (as measured by the UPDRS but not the WRS and the NUDS) during this interval. At the second follow-up, in comparison with baseline, the treatment group showed a significant worsening of disability (as measured by the UPDRS but not the WRS and the NUDS) and significantly slower walking speed. The control group showed a significant worsening of disability (as measured by the UPDRS and the NUDS but not the WRS) and a significant decrease in function (as measured by the FIMsm but not the Barthel ADL Index). The control group also showed significantly slower walking speed and significantly decreased amplitude of step.

Comparing the two groups, the researchers found significantly less disability among participants in the treatment group on all three measures at the second follow-up. They also found significantly better function for the treatment group on both measures. Further, walking speed was significantly faster in the treatment group than in the control group.

What do the findings mean?

- For therapists and other providers, the study supports the positive effects of intensive, individualized, hospital-based physical rehabilitation therapy on the motor performance and functional outcomes of clients with Parkinson's disease. There was, however, a tendency for participants to experience decreased function after therapy was discontinued. Further, although the participants in the second study were randomly assigned to the treatment or the control group, participants in the control group appear to have had less disability, according to baseline scores.
- The physical rehabilitation therapy approach is labor-intensive and expensive but might decrease the cost of medical and personal care and increase clients' compliance with medications.

What are the study's limitations?

The results of the study may have limited generalizability because participants were not randomly selected and the sample sizes of both studies were small (n=8, and n=20, respectively). These design flaws threaten internal validity because the findings may not be applicable to the population of persons with Parkinson's disease.

Glossary

idiopathic—"arising spontaneously or from an obscure or unknown cause" (*Merriam-Webster's Medical Dictionary*)

Hoehn & Yahr—system of classifying symptoms

Stage 1: unilateral involvement only, usually with minimal or no functional impairment.

Stage 2: bilateral or midline involvement, without impairment of balance.

Stage 3: first sign of impaired righting reflexes. This is evident by unsteadiness as the patient turns or is demonstrated when he is pushed from standing equilibrium with the feet together and eyes closed. Functionally, the patient is somewhat restricted in his activities but may have some work potential depending upon the type of employment. Patients are physically capable of leading independent lives, and their disability is mild to moderate.

Stage 4: fully developed, severely disabling disease; the patient is still able to walk and stand unassisted but is markedly incapacitated.

Stage 5: confinement to bed or wheelchair unless aided.

Hoehn, M. M. & Yahr, M. D. (1967). Parkinsonism: Onset, progression, and mortality. *Neurology*, 17(5), S11–S26.

significance (or significant)—A statistical term, this refers to the probability that the results obtained in the study are not due to chance, but to some other factor (such as the treatment of interest). A significant result is likely to be generalizable to populations outside the study.

Significance should not be confused with clinical effect. A study can be statistically significant without having a very large clinical effect on the sample. For example, a study that examines the effect of a treatment on a client's ability to walk may report that the participants in the treatment group were able to walk significantly longer distances than the control group. However, if you read the study you may find that the treatment group was able to walk, on average, 6 feet, whereas the control group was able to walk, on average, 5 feet. Although the outcome may be statistically significant, a clinician may not believe that a 1-foot increase will improve his or her client's function.

■ Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

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For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.



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