**Abstract**

Objective: To review existing studies evaluating the effectiveness of physical exercise on mortality, strength, balance, mobility, and activities of daily living (ADL) for sufferers of Parkinson's disease (PD).

Data Sources: The following databases were searched (1) Cochrane Database of Systematic Reviews, (2) Cumulative Index to Nursing and Allied Health Literature (CINAHL), (3) PubMed and (4) Medline/NARIC (National Rehabilitation Information Center) using combinations of key words Parkinson's disease and physical exercise. Only articles written in English were included. References cited were also examined.

Study Selection: Studies were eligible if (1) only patients with PD were included in the intervention study (there were many studies that evaluated the benefits of exercise after stroke, cardiac arrest, sports injuries, surgery, and arthritis, but only a few for patients with PD), (2) the intervention included some form of physical or therapeutic exercise, (3) the effects of the physical exercise were evaluated, and (4) the studies were published in a refereed journal. Because few studies were found that dealt with PD patients exclusively, all studies that evaluated the effectiveness of physical exercise for only PD patients were included. Seven studies met our criteria and were selected. Three of the selected studies were randomized controlled studies, 1 was an open trial, and the other 3 relied on patients' own assessments.

Data Synthesis: Outcomes in the studies were measured in terms of physical improvements in patients with PD, such as improved axial rotation, functional reach, flexibility, balance, muscle strength, short-step gait, and mobility. All studies reviewed show that exercise improves overall performance in PD patients. Improvements were measured using standardized tests and other measurement scales.

Conclusions: The results of the present research synthesis support the hypothesis that patients with PD improve their physical performance and activities of daily living through exercise. Future studies should include the development of standardized exercise programs specific for problems associated with PD as well as standardized testing methods for measuring improvements in PD patients. There is also a need for longer term studies (over 1 year) to assess if improvements achieved during the intervention stage are retained long term.

#### Abstract

Purpose of review: Gait disorders and balance impairments are one of the most incapacitating symptoms of Parkinson's disease. Here, we discuss the latest findings regarding epidemiology, assessment, pathophysiology and treatment of gait and balance impairments in Parkinson's disease.

Recent findings: Recent studies have confirmed the high rate and high risk of falls of patients with Parkinson's disease. Therefore, it is crucial to detect patients who are at risk of falling and how to prevent falls. Several studies have shown that multiple balance tests improve the prediction of falls in Parkinson's disease. Difficulty turning may be caused by axial rigidity, affected interlimb coordination and asymmetries. Turning difficulties are easily assessed by timed performance and the number of steps during a turn. Impaired sensorimotor integration, inability of switching between sensory modalities and lack of compensatory stepping may all contribute to the high incidence of falls in patients with Parkinson's disease. Similarly, various studies highlighted that pharmacotherapy, neurosurgery and physiotherapy may adversely affect balance and gait in Parkinson's disease.

Summary: Insights into the pathophysiology of Parkinson's disease continue to grow.

At the same time, it is becoming clear that some patients may in fact deteriorate with treatment. Future research should focus on the development and evaluation of multifactorial fall prevention strategies.