

# Parkinson's disease and exercise

## What is Parkinson's disease?

Parkinson's disease is a common and debilitating disorder. Nerve cells in a part of the brain that produce dopamine are affected. The nerve damage affects the brain's control of the muscles, which causes shaking (tremor), increased muscle tone (stiffness), slowed movements and balance problems. Parkinson's disease also affects some thinking abilities, especially the ability to control and regulate behaviour, and may cause anxiety and depression. After dementia, Parkinson's disease is the second most common degenerative condition of the brain. The incidence increases with ageing.

Drugs can control the symptoms in most patients, but unfortunately only for a limited time. The drugs either replace or maintain a chemical in the brain called dopamine. Dopamine is involved in sending nerve signals. Because the disease worsens with time, the drug dosage must gradually increase to control the symptoms. At these higher doses, the drugs cause serious side effects.

Doctors track the progress of the disease either on a special rating scale or by clinically assessing the symptoms. Tremor, balance, movement, speech, sense of smell, nerve function and depression are usually examined.

## Why is exercise important?

People with Parkinson's disease often do not do much exercise which is associated with a loss of fitness. This can worsen the effects of the disease and any other conditions they may have. For example, heart disease, muscle weakness, osteoporosis (weak bones), trouble sleeping, constipation and depression can all grow worse. Loss of fitness also increases the risk of falls, especially in people with Parkinson's disease, who are already much more likely to fall than healthy people. This tendency to fall and consequent injury (e.g. hip fractures) can eventually result in loss of independence and early admission to nursing homes. People often live with Parkinson's disease for a long time, which has profound implications for the care and treatment of individuals, and has significant impact for their families and the health-care system.

Exercise potentially benefits the health and wellbeing of people with Parkinson's disease in many ways. By increasing fitness, exercise protects against many complications of the disease. For example, better mobility may improve quality of life and prolong independent living. Exercise may also have positive effects on mood and improve their brain function and make drug therapy more effective. It also provides a means by which individuals can actively participate in the management of their disease.

## How does exercise help?

General physical activity and specific exercises are widely used to treat people with Parkinson's disease. Exercise provides many benefits. For example, exercise can improve nerve and physical function, reduce psychological symptoms, and help people socialise more easily. Some studies have shown that increased exercise reduces the death rate in people with Parkinson's disease.

Intensive cycling exercise improves both heart and lung (aerobic) fitness and muscle control and function. This exercise reduces the increased muscle rigidity and slowed movements caused by the disease, and also increases hand coordination.

Walking speed in people with Parkinson's disease is related to muscle strength in the legs, so exercise programs aim to increase leg strength. Programs of resistance (weights) training increase muscle mass and strength, and also improve stride (step) length, walking speed and walking distance. Studies show that exercise on a treadmill produces immediate and long-term benefits, especially when done for a long time at a low intensity.

Rhythmic stimulation of the brain via the eyes or ears while walking can help, and balance training (alone or combined with resistance training) can improve balance and stability. People also have better quality of life.



## What exercise is best?

**Resistance training** increases strength in older people and people with Parkinson's disease. Recent research indicates that high resistance progressive exercise is effective with initial levels of 30-40% 1RM being increased to 70% 1RM and from 1 to 3 sets of 8 repetitions. 1 RM is the maximum amount of weight one can lift in a single repetition for a given exercise. However, the best program for these exercises has yet to be determined. It is also important to be mindful that people with Parkinson's disease tire easily, and that it may be best to use an individually tailored approach that accounts for these limitations.

**Treadmill walking** is frequently used for people with Parkinson's disease. You can either walk slowly or use a training program that gradually increases your walking speed. Although the optimal program has yet to be determined recent research indicates that longer duration low intensity walking is more effective than high intensity short duration walking. If you have difficulty walking, body weight supports can be used.

Even if you have trouble walking or 'freeze' when trying to move, you may still be able to **cycle**. Stationary cycling is ideal if you have this problem. Pacing yourself or deliberately increasing the cycling rate can improve your heart and lung function and your walking ability. It also "exercises" other neural circuits important for movement other than those involved in locomotion.

'**Cueing exercises**' involve walking while listening or seeing cues that mimic the rhythm of walking. These exercises can help improve your walking movements and overcome difficulty with gait initiation and freezing.

'**Dance**' provides exercise to music that can facilitate functional and expressive movement. It also provides important social interaction and can lead to improvements in perceived quality of life.

In '**dual tasking**' exercises, you do a secondary task (e.g. forming words or counting backwards) while walking. These exercises usually try to improve one aspect of walking at a time (e.g. step length).

Supervised exercise programs do not suit everyone. In the Netherlands ParkFit study, personal coaches devised individual exercise programs for people with Parkinson's disease. These programs cater for individual abilities and preferences, and incorporate increased physical activity into your everyday life. An Accredited Exercise Physiologist can assist in designing individual exercise programs for people with Parkinson's disease.

## References and further information

Exercise is Medicine Australia [www.exerciseismedicine.org.au](http://www.exerciseismedicine.org.au)

Find an Accredited Exercise Physiologist [www.essa.org.au](http://www.essa.org.au)

Exercise Right [www.exerciseright.com.au](http://www.exerciseright.com.au)

Parkinson's Australia [www.parkinsons.org.au](http://www.parkinsons.org.au)

Michael J Fox Foundation [www.michaeljfox.org/](http://www.michaeljfox.org/)

Parkinson's UK [www.parkinsons.org.uk/](http://www.parkinsons.org.uk/)

Dance for Parkinson's Australia [www.danceforparkinsonsaustralia.org/](http://www.danceforparkinsonsaustralia.org/)

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