

# Parkinson's disease and physical activity

## What is Parkinson's disease?

Parkinson's disease (PD) has an annual incidence rate ranging from 5 to 346 cases per 100 000 in Europe [1]. PD is a progressive and neurodegenerative type of movement disorder. It is a multisystem disorder affecting nerve cells (among others), in a region of the brain which produces dopamine, an essential substance for the control of motor and cognitive function. PD results in tremor, stiffness, slowness of movements and postural disorders, as well as depression, sleep and cognitive disorders [2]. The main risk factor for PD is age. However, exposure to pesticides, traumatic brain injury and physical inactivity may also be associated with PD [3].

## What are the effects of physical activity on Parkinson's disease?

Aerobic exercise, such as treadmill training, Nordic walking or dance, improves motor function, postural control and gait [4]. Exercise may protect neuronal cells and mitochondria (i.e. the energy factory of the cells) from degeneration and dysfunction. It may activate factors that are involved in the survival of the current neurons and in the generation of new neurons in some regions of the brain [5]. Obviously, aerobic exercise attenuates the negative effects of PD-induced inactivity on the cardiovascular system. Furthermore, resistance exercise improves force production, muscular endurance and muscle size in individuals with PD [6]. Training which includes two concomitant exercises (e.g. walking and counting) may enhance the performance in both tasks in individuals with PD [7].

## What are the risks?

With the evolution of PD, the risk of falls increases. In addition, patients in the later stages of the disease may suffer from orthostatic hypotension and general physical impairment. Physical activity should be supervised, and spotters should be used, in order to prevent falls, especially during exercises, which challenge postural control.

## Recommendations

Physical activity is strongly recommended throughout the evolution of PD, and should be adapted to disease stage. Resistance training increases strength and should be performed as 1-3 sets of 8-12 repetitions for exercises at 70% of maximal weight that can be lifted on 2-3 days per week. For individuals in the later stages of the disease, training frequency can be increased to 4-5 days per week and the number of repetitions can be decreased to 1-6 [8]. Recommendations for aerobic exercise include 2-4 hours per week of mild to moderate intensity activity (40-50% of the heart rate reserve) [9]. Treadmill walking and cycle-ergometer can be used, especially to prevent falls. Like dance (waltz, Argentine tango, etc.) [6], boxing-based exercises involve the use of external cues, the practice of different movement strategies and dynamic postural control [10]. Therefore, these play-based physical activities are also recommended.

## References

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- Full references are available on [www.sport-sante.lu](http://www.sport-sante.lu)

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