

# Parkinson's disease



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**Parkinson's disease:** Parkinson's disease (PD) is a chronic progressive neurological disorder characterised by motor symptoms of resting tremor, rigidity, bradykinesia, and postural instability.

## Causes:

- Usually idiopathic
- Mutation in parkin or alpha-synuclein genes
- Exposure to MPTP (synthetic opioid)

## Pathophysiology:

- Degeneration of dopaminergic neurons in substantia nigra → tremor, rigidity, akinesia, postural instability
- Dopamine depletion from basal ganglia → disruption of connection to thalamus + motor cortex → Parkinsonism
- Build up of Lewy bodies in neurons, with death of astrocytes + increase of microglia in substantia nigra

## Presentation

Mnemonic: **TRAPS**

- Tremor
- Rigidity
- Akinesia
- Postural changes (stooped)
- Stare

Psychiatric:

- Depression
- Anxiety
- Mood disturbance
- Impairment of cognitive function
- Dementia



- **Gait rehabilitation** with **visual/auditory cueing** – strips of tape on the floor to initiate or continue walking through areas that cause slowing or freezing (visual)/ counting 1-2-3 to initiate walking or stepping to the beat of a metronome
- **Tango dancing, boxercise and cycling** - improves balance and locomotion
- **Assessment:** 1. Gait assessment (speed, distance, forward & backward movement, stride length, cadence, ability to alter speed), 2. Transfers, 3. Handwriting, 4. Joint passive range of movement, 5. Global strength, 6. Static + dynamic balance 7. Dual tasking

Medical: Selegine, Anticholinergics, L-Dopa + Carbidopa (inhibit peripheral metabolism of L-Dopa), Amantadine, Bromocriptine (dopamine agonist)

## Diagnosis

- Based on clinical presentation: resting tremor, rigidity, bradykinesia
- Levodopa medication response: reduced tremor after dose suggests PD
- MRI brain: reduced density of the dorsolateral substantia nigra

## Management

Physiotherapy:

- Progressive strength training through **increasing repetitions** of body weight activities (for example, sit-to-stand repetitions), weights (for example, progressive resistance exercise), or resistance exercise on machines such as stationary cycles.
- **Repetitive task training:** range of tasks for upper limb weakness (such as reaching, grasping, pointing, moving and manipulating objects in functional tasks) and lower limb weakness (such as sit-to-stand transfers, walking and using stairs)

## Want to learn more?

With AcePhysio the learning journey doesn't stop here! Take a look at our further reading recommendations below to become an expert in Parkinson's disease:

1. Wu, P.L., Lee, M., & Huang, T.T. Effectiveness of physical activity on patients with depression and Parkinson's: a systematic review. PloS one, 2017:12(7).
2. Medijainen, Kadri et al. "Versatile guideline-based physiotherapy intervention in groups to improve gait speed in Parkinson's disease patients." NeuroRehabilitation vol. 44,4 (2019): 579-586.
3. Radder DLM, LÍgia Silva de Lima A, Domingos J, Keus SHJ, van Nimwegen M, Bloem BR, de Vries NM. Physiotherapy in Parkinson's Disease: A Meta-Analysis of Present Treatment Modalities. Neurorehabil Neural Repair. 2020 Oct;34(10):871-880.