



# Parkinson's Disease Information Sheet 2.8

## Mobility and Parkinson's Disease

**Idiopathic Parkinson's disease (Pd)** is a progressive neurological condition which is characterised by motor (movement) and non-motor symptoms.

Pd is classified as a movement disorder as all aspects of movement and mobility can be affected. This is due to a variety of reasons:

- Involvement of the basal ganglia
- Muscle rigidity
- Bradykinesia (slowness of movement)
- Postural instability
- Motor fluctuations
- Impact of Parkinson's medications

### Involvement of the Basal Ganglia

The basal ganglia lies in the midbrain and is partly responsible for controlled movement, especially learned or acquired skills such as walking and rising from a sitting position. Initiation of these skills is affected in people with Parkinson's (PWP).

### Muscle Rigidity

Rigidity is the term used to describe the muscle stiffness felt when a limb is passively moved by a clinician. It is described as either 'cogwheel' or 'lead pipe' rigidity. 'Cogwheel' refers to resistance impacted by tremor and 'lead pipe' describes resistance without tremor. Rigidity contributes to the classical flexed posture seen in Pd.

### Bradykinesia

Bradykinesia (slowness of movement) is a cardinal sign of Pd. Bradykinesia is a major factor in mobility and functional changes. It can impact on large voluntary movements such as standing up, walking and bed mobility. This also accounts for slowness in performing tasks such as eating, showering and dressing.

### Postural Instability

Postural instability occurs later in the disease process and results in poor balance and falls. Postural instability is assessed by the 'pull test'. In Pd this may result in a backward fall due to impaired balance.

### Motor Fluctuations

Motor fluctuations are both a sign of disease progression and a complication of medication used in the treatment of Pd. It is estimated that 40% of PWP will experience motor fluctuations within four to six years after commencing levodopa. Motor fluctuations initially take the form of 'end of dose failure'. This describes a wearing off of treatment benefit before the next dose is due and may result in increased bradykinesia or mobility changes. A further motor fluctuation is dyskinesia (involuntary movements) which is a side effect of long-term levodopa use.

### Impact of Parkinson's Medications

The aim of Pd medications is to improve symptoms such as bradykinesia and mobility changes. A common side effect is hypotension (lowering of blood pressure) especially on standing. This can result in dizziness and an increased risk of falling.

Movement changes related to Pd are:

- Postural changes
- Shuffling/festinating gait
- Freezing of gait and start hesitation
- Turning changes
- Dual tasking problems
- Falls

### Postural Changes

Postural changes are seen as a stooped, forward flexed stance with reduced arm

swing. Initially one arm is affected. As the disease progresses, this becomes bilateral (affecting both sides).

### **Shuffling/Festinating Gait**

As Pd progresses shortened stride length and stride height results in a shuffling gait – also known as a festinating gait. This can lead to an increased risk of tripping when slight changes in walking surfaces occur for example, mats.

### **Freezing of Gait and Start Hesitation**

Freezing of gait refers to the sudden inability to move ones feet during walking and may occur as the disease progresses. Freezing commonly occurs in confined spaces such as doorways and can be associated with turning. This may last for a few seconds. Stress and anxiety may increase the occurrence of freezing.

Start hesitation refers to a momentary difficulty in initiating mobility such as starting to walk after rising from a sitting position.

### **Turning Changes**

Changing direction while walking may be affected as the number of steps required increases due to the decreased length of the steps. A quickly executed turn will result in balance being affected and falls may result. Falls associated with turning often happen without warning.

### **Dual Tasking Problems**

The basal ganglia is responsible for the smooth execution of automatic skills and in Pd the ability to carry out two or more automatic skills or tasks is affected. Walking and talking simultaneously can lead to shuffling and/or slowness and even cessation of walking. Walking while carrying objects can result in the same problems.

### **Falls**

Falls may occur in Pd for many reasons which have been described – postural instability, low blood pressure, festinating gait, freezing of gait, turning changes and dual tasking. The tendency to fall backwards or move backwards without warning is called retropulsion.

Avoiding falls is essential as serious injuries such as fractures (commonly hip or skull) may result. The fear of falling and associated loss of confidence may be as disabling as an actual fall.

### **Practical Advice for Safe Mobility**

- Maintain good posture by conscious attention and daily stretches.
- Maintain an enjoyable exercise routine.
- Wear appropriate footwear (closed with flat or low heels).
- Rise from lying or sitting position slowly and remain by the bed or chair for a short period of time.
- Report dizziness on standing to your GP as this may be caused by a drop in blood pressure.
- Remove unnecessary mats.
- Maintain an uncluttered environment.
- Be cautious when stepping backwards.
- Arrange a referral to a physiotherapist with expertise in Pd for assessment and introduction of an exercise program.
- Concentrate on large steps and a heel/toe walking pattern.
- Avoid dual tasking.
- Turn in a wide arc rather than a sharp change of direction.
- Strategies or cues to overcome freezing of gait include counting 'one, two, three' or clapping to maintain a rhythm or initiate movement. Swaying from side to side may overcome freezing of gait. A physiotherapist may apply tape to the floor in problem

areas. This acts as a visual cue to overcome freezing.

- If freezing of gait occurs do not try to automatically continue with mobility. Use a strategy discussed in dot point above or accept the freeze and wait for mobility to return.
- Be aware of visual changes and report any difficulty with descending stairs to the treating specialist.
- Report falls to GP and treating specialist.

## **Aids and Equipment**

A physiotherapist can assess if a walking aid is required. This will ensure that an appropriate aid is issued, for example, a walking frame.

An occupational therapist can assess the safety of the home environment. Appropriate chairs, equipment and rails will maintain independence and safety.

Accessing the above health professionals may require a GP referral. In most cases these services are available through Aged Care Assessment Teams. For younger PWP, various options are available for assessment and loan of equipment. Your GP will be aware of the referral process in your area.

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For further information please contact your state Parkinson's organisation: FREECALL 1800 644 189

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