

information

MOBILITY AND PARKINSON'S

Parkinson's is a progressive neurological condition, which is characterised by both motor (movement) and non-motor symptoms.

Parkinson's was originally classified as a movement disorder as all aspects of movement and mobility may be affected. The cause is multi-factorial:

- Basal ganglia changes
- Bradykinesia (slowness of movement)
- Motor fluctuations
- Muscle rigidity
- Postural instability

Basal Ganglia Changes

The ability to produce movement is dependent on the complex motor circuit of the basal ganglia and other parts of the mid-brain. Learned complex actions such as walking, turning in bed, sitting and standing depend on the basal ganglia. Parkinson's reduces the amount of dopamine available, resulting in disruption of the functions of the basal ganglia. Subsequently stride length and height become reduced and difficulty initiating movement and controlling movement size occurs.

Bradykinesia

Slowness of movement, a cardinal sign of Parkinson's, also includes decreased spontaneous movement and decreased amplitude of movement. Bradykinesia is a major factor in mobility and function, impacting on such tasks as eating, showering and dressing.

Parkinson's medications often initially reduce bradykinesia and re-emergence is frequently seen at end of dose and with progression of the condition.

Motor Fluctuations

Motor fluctuations are a sign of progression of the condition and also a complication of Parkinson's medications. It is estimated that 40% of people living with Parkinson's experience motor fluctuations approximately four to six years after commencing levodopa therapy. End of dose failure is a form of motor fluctuation which occurs when the benefit from the medication wears off before the next dose is due. This may result in increased bradykinesia or other mobility changes.

Muscle Rigidity

This is a cardinal sign of Parkinson's and is obvious to the clinician when a limb is passively moved rather than being reported by the person with Parkinson's. It is described as 'cogwheel' or 'lead-pipe' rigidity. 'Cogwheel' refers to the presence of tremor superimposed on rigidity and 'lead-pipe' describes the rigidity in the absence of tremor. Rigidity contributes to the classical flexed posture of Parkinson's and impacts on mobility and activities of daily living. It may also cause pain or discomfort.

Postural Instability

This usually occurs later in the progression of the condition, resulting in impaired balance and falls. The treating medical specialist will assess balance using the 'pull' test. In Parkinson's the ability to correct balance is compromised. In addition to falls caused by postural instability, there is a risk associated with Parkinson's medication.

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IN THIS TOGETHER
parkinson's
AUSTRALIA

MOBILITY AND PARKINSON'S

The aim of the medication is to improve symptoms such as bradykinesia and muscle rigidity. However, a common side effect is hypotension (low blood pressure). This often occurs on standing, when it is referred to as 'postural hypotension'. This may result in dizziness, unsteadiness and an increased risk of falling.

Movement changes related to Parkinson's include:

- Falls
- Freezing of gait and start hesitation
- Multitasking issues
- Postural changes
- Shuffling/festinating gait
- Turning changes

Falls

Falls associated with Parkinson's may occur for the reasons already outlined. The tendency to fall backwards or move backwards without warning is called retropulsion.

The fear of falling and the associated loss of confidence may be as disabling as actual falling. Avoiding falls is essential because of the risk of serious injuries.

Freezing of Gait and Start Hesitation

Freezing of gait refers to the sudden inability to walk in mid-stride, while turning or going through a confined space such as a doorway. This may occur with the progression of Parkinson's. While stressful it may only last for a few seconds. Stress and anxiety may increase the risk of freezing.

Start hesitation refers to momentary difficulty in walking especially after rising from a sitting or lying position.

Multitasking Issues

In Parkinson's the ability to carry out two or more automatic skills simultaneously may be affected. This is due to the changes in the basal ganglia.

Walking and talking simultaneously can lead to increased slowness, shuffling or even an inability to walk while talking. Walking and carrying objects may result in similar problems and can increase the risk of falling. Conscious attention to task by avoiding multitasking will ensure safer mobility.

Postural Changes

Parkinson's may result in forward flexed posture or stooping with reduced arm swing. When the trunk is stooped forwards the stride length and height becomes shorter.

Shuffling/Festinating Gait

This occurs due to postural changes, is part of the typical Parkinson's gait pattern and is a risk factor for falls due to tripping.

Turning Changes

Turning is a complex skill and when changing direction mobility may be affected as the number of steps required increases due to the shortened stride length. A quickly executed turn may result in poor balance and falls may occur. Falls associated with turning often happen without warning.

Aids and Equipment

It is recommended that mobility is reviewed by a physiotherapist with expertise in Parkinson's if a walking aid is required or if mobility is compromised. This will ensure that the appropriate aid is recommended and strategies are introduced.

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IN THIS TOGETHER
parkinson's
AUSTRALIA

MOBILITY AND PARKINSON'S

An occupational therapist can assess the safety of the home and offer advice as required. Appropriate chairs, equipment and the provision of grab rails in bathrooms 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 (ACAT). For younger people there are various options available – your GP will be aware of the services available in your area.

Practical Advice for Maintenance of Safe Mobility

- Maintain an enjoyable exercise routine
- Maintain good posture by daily stretching and conscious attention to standing tall
- Wear appropriate footwear (closed shoes with flat or low heels)
- Remove unnecessary mats
- Maintain an uncluttered environment
- Be cautious when stepping backwards
- Concentrate on taking large steps
- Concentrate on placing the heel to the ground first
- Avoid multitasking
- If freezing of gait occurs use strategies such as
 - counting 1, 2, 3...
 - clapping to maintain a rhythm
 - swaying to initiate movement
 - tape applied to floor in doorways
- Turn in a wide arc or U-turn rather than a sharp change of direction
- Be aware of any changes in vision and report any difficulty with going down steps or stairs to the treating specialist
- Rise from a lying or sitting position slowly and remain by the bed or chair for a short period of time
- For bed mobility changes see Fact Sheet 2.7 - Sleep and Parkinson's

- Report dizziness on standing to the treating specialist or GP as this may be related to low blood pressure
- Report falls to the treating specialist and GP
- Consider a personal alarm device
- Arrange a referral to a physiotherapist with expertise in Parkinson's

Exercise has been proven to be essential in maintaining mobility and quality of life. Recent research suggests that tai chi, walking, movement to music and yoga are most beneficial.

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