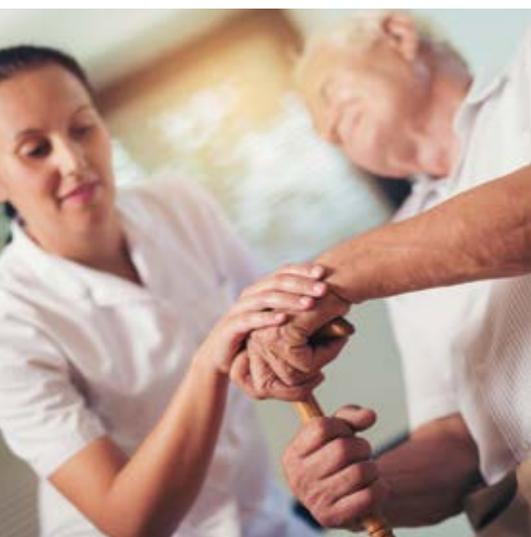


# Parkinson's Disease



Visit [www.garvan.org.au](http://www.garvan.org.au) for more information about the work of the Garvan Institute of Medical Research.

## What is Parkinson's Disease?

Parkinson's disease (PD) is a gradually progressive disorder of the brain that affects movement, causing tremors and stiffness. Other symptoms include issues with sleeping, ie loss of the sense of smell, speech and swallowing problems, cognitive impairment, depression and anxiety.

The movement-related symptoms are caused by the progressive degeneration of brain cells (neurons) in the part of the midbrain that controls smooth, coordinated movement. When healthy, these neurons release dopamine, a neurotransmitter that stimulates the nerve cells that control the muscles. By the time symptoms appear, people with PD will have lost up to 80 per cent of specific dopamine-producing cells.

The exact cause of PD is unknown. A current hypothesis is that disease progression involves the spread of the toxic protein called alpha-synuclein within the brain, causing cells to degenerate. As more and more parts of the brain are affected, people living with Parkinson's experience a growing range of symptoms.

## Symptoms

The movement-related symptoms of PD are initially mild, often beginning on one side of the body. As they progress, symptoms become more pronounced and appear in other parts of the body.

The characteristic Parkinson's tremor can begin in the forearms, hands or fingers, especially when the limb is at rest. The foot, mouth and chin can also be involved. Over time, PD reduces the ability to move and slows voluntary movements (bradykinesia), such as standing up and sitting down. It becomes difficult to initiate walking and the gait of a person with Parkinson's is marked by shuffling feet, lack of arm swing and a lowered head posture.

Muscle stiffness can also limit the range of motion and cause pain. The person's posture may become stooped. They may develop balance problems and fall more frequently. As it becomes harder to write, handwriting may appear smaller.

In later stages, as the automatic movements of the muscles become slower, people with PD may develop changes to their speech, and difficulties with swallowing, passing urine and constipation. People with PD also often have sleep problems and may act out their dreams. They may experience sudden drops in blood pressure, leaving them light headed. They may lose their sense of smell, feel fatigued and have pain in various parts of their bodies. Later stage PD is often accompanied by depression, cognitive difficulties and dementia.

## Treatment and Prognosis

As there is no cure for Parkinson's, the primary drug therapy aims to overcome the problem of depleted dopamine stores in the brain. Different drugs have different actions: some mimic the action of dopamine, and some enhance the action of the remaining dopamine stores.

However, drugs for PD often lose their efficacy over time, leading to higher doses being required. Some drugs, such as Levodopa, can also cause involuntary movements (dyskinesia). Other treatment side-effects can include out-of-character behaviour, confusion, hallucinations, insomnia, nausea and gastrointestinal problems.

In severe cases, neurosurgery where lesions are made on parts of the brain may be necessary to interrupt involuntary movement. Deep brain stimulation (DBS), where an electrode is implanted in the affected area of the brain, may also help alleviate symptoms. DBS is most often offered to people with advanced PD who have unstable medication responses as it can markedly improve movement. Although DBS may provide a sustained benefit for Parkinson's symptoms, it doesn't stop PD from progressing.

Although symptoms can be fairly well controlled, with exercise and physical therapy playing an important role, living with PD can be extremely frustrating and depression is common. Being a carer for a person who has PD can also be very difficult.

# Parkinson's Disease

## Did You Know?

- Each year, around 11,500 Australians are diagnosed with Parkinson's disease.
- It is estimated that there are currently around 70,000 Australians living with Parkinson's disease.
- Parkinson's disease is usually diagnosed around the age of 65, but one in 10 will be diagnosed before they are 45.
- Men have a somewhat higher risk of developing Parkinson's than women.



Associate Professor Antony Cooper

## Garvan – A World Class Centre for Parkinson's Research

The Garvan Institute's PD research program is multidisciplinary, focusing on translating basic scientific discoveries into the clinic. These include:

- Defining the genetic characteristics of PD;
- Using this genetic insight to develop prognostic and therapeutic biomarkers (tests performed on biological samples (ie blood, tissue) that indicate the early presence of a disease, or help guide treatment choices);
- Neuroprotection (preserving, as much as possible, neuronal structure and function);
- Preventing disease progression.

To achieve this, Garvan's researchers are sequencing and measuring a complete set of RNA (ribonucleic acid) from individuals with PD as well as healthy individuals (to identify the differences). Present in all living cells, RNA's primary role is to carry messages from DNA for the synthesis of proteins. The information gained from the study of RNA will help researchers to better understand how PD develops, identify potential biomarkers, as well as help define a very personalised approach to treatment.

## Further Sources of Information

Shake It Up Foundation	<a href="http://www.shakeitup.org.au">www.shakeitup.org.au</a>
Parkinson's Australia	<a href="http://www.parkinsons.org.au">www.parkinsons.org.au</a>
Cure Parkinson's Trust	<a href="http://www.cureparkinsons.org.uk">www.cureparkinsons.org.uk</a>
Michael J Fox Foundation	<a href="http://www.michaeljfox.org">www.michaeljfox.org</a>

## Garvan Institute of Medical Research – How You Can Get Involved

The Garvan Institute of Medical Research was founded in 1963. Initially a research department of St Vincent's Hospital in Sydney, it is now one of Australia's largest medical research institutions with more than 600 scientists, students and support staff.

Garvan's research divisions are: bone biology, cancer, diabetes and metabolism, genomics and epigenetics, immunology, and neuroscience.

Your support makes it possible for Garvan scientists to continue their vital work. You can help by making a donation or a bequest, or fundraising for Garvan.

**For details on how to get involved, visit [www.garvan.org.au](http://www.garvan.org.au) or phone (02) 9295 8110 during business hours.**

