

Parkinson's disease (PD) is a progressive neurodegenerative disease that primarily affects the parts of the brain that controls movement, resulting in tremors, stiffness, and slowness. Difficulty walking and loss of balance typically emerge as the disease progresses. Some people may also develop dementia as their PD progresses into the later stages of the disease, often resulting in significant memory loss, difficulty concentrating, thinking, completing routine activities, and navigating in their environment. Behavioural problems are also common including depression, hallucinations and delusions.

About Parkinson's disease

PD results from a decreased production of a chemical in the brain called dopamine. This shortage of dopamine is the result of nerve cells, called neurons, in parts of the brain gradually deteriorating. The part of the brain that is most affected is located deep within the brain stem and is known as the substantia nigra. Other brain chemicals such as serotonin and acetylcholine also are reduced as a result of the PD neurodegenerative process and symptoms such as depression and dementia may respectively emerge as a result.

Dopamine is responsible for sending out messages from the substantia nigra to other parts of the brain to control movement of the body and coordination. When there is not enough dopamine being produced and the majority of dopamine-producing cells have deteriorated, motor symptoms of PD will develop. Low levels of serotonin can cause mood symptoms such as feeling sad and having less motivation to do things. Low levels of acetylcholine in PD produces inattention, profound fluctuations in alertness, and visual hallucinations, i.e., dementia symptoms.

Other names used for PD include: Idiopathic Parkinson's disease.

What are the symptoms?

The age of symptom onset and the progression of PD can vary among people; however, as PD is a progressive degenerative disease, symptoms will gradually worsen with time. Symptoms of PD are most commonly seen in people over the age of 50, but may begin under the age of 40.

Early symptoms of this disease are often related to difficulties with a person's movement. These difficulties with movement may be experienced in one or both sides of the body. People with PD may experience movement difficulties, including: rigidity, tremors, bradykinesia (slowed movements), loss of balance or falls. People with PD may also complain that they feel "stuck in place" when they try to start walking.

In addition to movement symptoms, a person with PD may experience changes in their personality, such as irritability, depression and anxiety. Sleep disorders, changes in appetite, dry skin, low blood pressure upon standing and excessive sweating are among the physical symptoms of PD.

With the progression of PD, some people will experience changes in their cognitive abilities and may develop dementia. People with cognitive symptoms of PD typically experience difficulties with memory, concentration, carrying out routine activities, and the ability to think quickly. Visual hallucinations and the inability to control emotions are also common features of the dementia associated with PD. These symptoms have a tendency to fluctuate, causing them to seem better or worse at different times.

How is Parkinson's disease diagnosed?

It can be challenging to diagnose PD as there is no single test to identify it, and there are a number of symptoms that are shared with other medical conditions.

The amount of time that it takes to get a PD diagnosis can vary as it depends on a number of different factors, such as: the person's age and medical history as well as the symptoms present at the time.

To help make a PD diagnosis, a physician will often conduct a comprehensive assessment that may include physical, neurological and psychiatric exams, together with a review of the person's complete medical history (including a review of current and past medications that could be causing some of the physical symptoms). This thorough assessment helps physicians to rule out other conditions that could be causing the symptoms. Diagnosis is generally made and confirmed by a neurologist based on a constellation of symptoms including tremor, rigidity, and slowness as well as through a detailed physical examination confirming the typical features of the disease.

As people with Parkinson's are at an increased risk for developing dementia, a physician will often monitor them closely for changes in their cognitive functioning. If cognitive changes are identified, a physician may request an MRI to help detect any structural changes in the brain that could be causing the changes in cognition.

What are the causes or the risk factors?

At present, there is no known cause of the majority of cases of PD although rare genetic abnormalities can sometimes be inherited in families that cause the disease. However, similar to other neurodegenerative disorders, like Lewy body dementia, PD is characterized by an abnormal clumping of a natural protein called alpha-synuclein in brain cells. These abnormal deposits are called "Lewy bodies," after the scientist who first described them. It is still unknown what causes the formation of Lewy bodies, and why they result in the deterioration of brain cells but researchers believe that these deposits could be linked to the cause of PD.

Some risk factors have been identified as playing a role in the development of PD, including: age (the risk of PD increases with age); gender (men are at an increased risk of PD) and genetics (having a close relative with PD increases the risk of developing the disease).

Is there treatment?

Currently there is no known cure for PD, although people can live with the disease for many years. Medications are often used to manage the symptoms of PD. Replacement of the deficient dopamine using medications such as levodopa can ameliorate the motor symptoms. Medications used in Alzheimer's disease such as cholinesterase inhibitors help to increase brain acetylcholine levels and can also be used to improve symptoms of dementia associated with PD. In some cases, surgery may be recommended for severe motor fluctuations observed in PD depending on the symptoms present, response to dopamine medications and disease stage.

Therapeutic approaches are also supporting people living with PD to manage symptoms of their disease. Occupational and physical therapies that are focused on balance and stretching exercises may help to maintain physical functioning throughout the progression of the disease. Speech therapy has also been found to improve difficulties with verbal communication, such as slurred speech, that can be associated with PD.

Support is available:

Visit the Alzheimer Society's website at www.alzheimer.ca or contact your local Alzheimer Society. For more information on PD, please visit the Parkinson Society Canada www.parkinson.ca.

Additional resources:

- Alzheimer's Association:
<http://www.alz.org/dementia/parkinsons-disease-symptoms.asp>
- Alzheimer Europe:
<http://www.alzheimer-europe.org/Dementia/Other-forms-of-dementia/Neuro-Degenerative-Diseases/Dementia-in-Parkinson-s-disease-PDD?#fragment-1>
- Alzheimer's Society UK:
http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=135

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Alzheimer's Society (UK), *Rarer Causes of Dementia*

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http://www.hopkinsmedicine.org/healthlibrary/conditions/nervous_system_disorders/parkinsons_disease_and_dementia_134,50/

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<http://www.mayoclinic.org/diseases-conditions/parkinsons-disease/basics/definition/con-20028488>

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Parkinson's UK, *Dementia and Parkinson's*

<http://www.parkinsons.org.uk/dementia>

Alzheimer Society

Alzheimer Society of Canada

20 Eglinton Avenue West, 16th Floor, Toronto, Ontario, M4R 1K8

Tel: 416-488-8772 • 1-800-616-8816 • Fax: 416-322-6656

E-mail: info@alzheimer.ca • Website: www.alzheimer.ca

Facebook : www.facebook.com/AlzheimerSociety • Twitter : www.twitter.com/AlzSociety

