

# Parkinson's Disease

## Questions & Answers



**THE BACHMANN-STRAUSS**  
Dystonia & Parkinson Foundation, Inc.

# What is Parkinson's disease?

Parkinson's disease is a disorder of the central nervous system caused by a change in the portion of the brain that controls movements like walking and balance. Parkinson's disease may appear at any age, but it is most common in people over 50 and rare in those under 30. It is both chronic – it persists over a long period of time – and progressive – its symptoms grow worse over time. It is not contagious nor is it usually inherited. Currently, there are approximately one million Americans living with Parkinson's disease.

## WHAT CAUSES IT?

Parkinson's disease occurs when certain nerve cells, or neurons, die or become impaired. This degeneration occurs in an area of the brain called the *substantia nigra*, which is responsible for the control of movement. Normally, these neurons produce a chemical known as *dopamine*, which is responsible for transmitting signals across the nerve pathways to produce smooth, purposeful muscle activity. Loss of dopamine causes nerve cells to fire out of control, leaving patients unable to direct or control their movements in a normal manner. Studies show that Parkinson's disease patients have a loss of 80 % or more of dopamine-producing cells.

The reason why these cells die or become impaired is still a mystery, but research scientists continue to find new clues. Most scientists believe that both genetic and environmental causes are contributing factors but, at this point, the exact nature of these factors is still unclear.

## COMPLICATIONS OF DRUG TREATMENT

*Dyskinesias* – uncontrollable, abnormal movements – develop in many patients after several years of treatment with Levodopa. Amantadine may help to partially relieve dyskinesias, but is not effective at suppressing them completely in most patients.

*Hallucinations* and *delusions* occur in some Parkinson's disease patients and may be a complication of prolonged drug therapy. Reducing doses and eliminating some medications may help in some cases. The use of an atypical antipsychotic drug, such as Seroquel (quetiapine) or Clozaril (Clozapine), that does not cause hallucinations or psychosis may help as well.

## BRAIN SURGERY

Surgery is usually reserved for patients whose symptoms are inadequately controlled by medication, or who have developed severe dyskinesias. Some forms of surgery may allow the dose of Levodopa to be reduced, further lessening dyskinesias. Brain surgery may help to rebalance the signals passing through the *globus pallidus* and the *subthalamic nucleus* -- centers of movement control in the brain. Surgically, *pallidotomy* is performed to destroy small parts of these brain centers while *deep brain stimulation* is performed by implanting an electrode into a deep nucleus in the brain which delivers controlled electrical pulses to targeted areas of the brain to block the signals that cause the loss of motor control.

## WHAT ARE THE SYMPTOMS?

There are four primary symptoms: shaking or tremor, slowness of movement, muscle stiffness or rigidity, and problems with gait and balance.

- **Tremor:** Shaking, especially when one isn't moving, can be seen in the hands, arms, legs, jaw and/or face. Typically, tremors that worsen or are present only with action, such as pouring water or writing, are due to another condition called *essential tremor*.
- **Rigidity:** General muscle stiffness may impair a full range of motion and interfere with normal activities. Rigidity may cause stooped posture, loss of facial expression; difficulty in swallowing, and may even cause the voice to become weak and high pitched.
- **Slowness of movement (*bradykinesia*):** Often the most disabling early signs of Parkinson's disease since it impacts normal daily living activities, this symptom can include an awkward or shuffling walk.
- **Poor Balance:** *Postural instability* usually begins later in the course of the disease. Since it impairs one's balance or coordination, it can lead to falls.

While not everyone will develop all four symptoms, at least two out of the first three symptoms are considered necessary for diagnosis.

Parkinson's disease can also cause a variety of other complications over time including a stooped posture or shuffling gait, diminished facial expression (*hypomimia*), and diminished handwriting size. Other manifestations of the disease include excess salivation and diminished sense of smell.

## HOW IS IT DIAGNOSED?

Parkinson's disease is usually diagnosed by a neurologist following an examination. Right now, there are no routine tests available. When symptoms first appear and signs are subtle, a precise diagnosis may be difficult. Disorders that may be mistaken for Parkinson's disease in its earliest stages include *essential tremor* and other neurodegenerative disorders.

## WHAT IS THE TREATMENT?

Although specific preventive measures are not currently known, there are many medicines available to help alleviate patients' symptoms.

For most patients, maintaining a healthy lifestyle, proper diet, regular daily exercise and, where necessary, physical therapy, are recommended for an optimal level of functioning.

Physical exercise and occupational therapy may be useful for some people. A balanced diet is important with fiber to prevent constipation, which is common in Parkinson's disease patients. Speech therapy often helps to increase voice volume.

Depression may be treated with counseling as well as with antidepressants. Support groups for both patient and caregiver are also beneficial for psychological support as well as for gaining more information and practical advice.

There are a large number of drugs available to treat this disease and symptoms can be controlled in almost all patients for many years. This *symptomatic therapy* does not influence the cause or the course of the disease however, when combined with exercise and a proper diet, most patients should be able to lead a happy and productive life.

## DRUGS USED TO TREAT PARKINSON'S DISEASE

- *Levodopa* (also called L-dopa) is currently the single most effective drug for treating Parkinson's disease. However, because of its long-term side effects, it is generally balanced with other drugs.

The brain converts Levodopa into dopamine, a chemical responsible for smooth, coordinated movement and other motor functions. Levodopa is generally taken with another drug, Carbidopa. In the United States, this combination is sold under the name, Sinemet<sup>®</sup>, Sinemet CR<sup>®</sup> as a generic, or StaLevo<sup>®</sup>, a new single pill containing Carbidopa, Levodopa and Entacapone.

- *Dopamine agonists* are drugs that stimulate dopamine receptors in the brain. They are increasingly being used instead of Levodopa in early Parkinson's disease. Agonists currently available in the United States are bromocriptine (Parlodel<sup>®</sup>), pergolide (Permax<sup>®</sup>), pramipexole (Mirapex<sup>®</sup>) and ropinirole (Requip<sup>®</sup>).
- *COMT inhibitors* lengthen the effect of Levodopa and may be prescribed with it. The COMT inhibitor available in the United States is entacapone (Comtan<sup>®</sup>).
- *Other agents*: Selegiline (Eldepryl<sup>®</sup>) inhibits the brain enzyme MAO-B by inactivating dopamine. Anticholinergic drugs, which block the communication of brain cells, may be useful against tremor and stiffness. Amantadine may relieve the primary symptoms of Parkinson's disease and also help reduce abnormal movements (dyskinesias) caused by Levodopa. Antidepressants may also help in the treatment of depression.

## IS THERE A CURE?

Remarkable progress has occurred in the study of Parkinson's disease in the last few years. Right now, however, there is no known cure. For most patients, symptoms can be relieved or controlled, and life expectancy is not significantly reduced.

The Bachmann-Strauss Dystonia & Parkinson Foundation, independently and in collaboration with other groups, funds scientific and clinical research around the world that continues to make real headway into the causes, treatment and eventual cure of this debilitating disease.



## **MAKING A DIFFERENCE**

*The Bachmann-Strauss Dystonia & Parkinson Foundation was established in 1995 to find better treatments and cures for the movement disorders dystonia and Parkinson's disease, and to provide medical and patient information. Key among its efforts, the Foundation funds scientific and clinical research and helps to raise awareness of Parkinson's disease and dystonia among the general public and the medical community.*

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