

Parkinson's is a disease of the central nervous system. It is a progressive disorder, meaning it gets worse over time. The disease affects a small area of cells in the middle of the brain. This area is called the substantia nigra. The cells slowly lose their ability to produce a chemical called dopamine.

The decrease in the amount of dopamine can result in one or more general signs of Parkinson's disease. These include shaking of the hands, arms and legs. They also include difficulty moving or keeping balanced while walking or standing. Also, there may be emotional changes, like feeling depressed or worried. The symptoms of Parkinson's differ from person to person. They also differ in their intensity.

The disease is named after James Parkinson. He was a British doctor who first described this condition in eighteen seventeen.

During the nineteen sixties, researchers discovered changes in the brains of people with the disease. These discoveries led to medicines to treat the effects of the disease. There is no cure for Parkinson's and no way to prevent it. And doctors still are not sure about the cause.

America's National Institutes of Health says at least five hundred thousand people in the United States are believed to have Parkinson's disease. About fifty thousand new cases are reported each year. That number is expected to grow as the average age of the population increases.

Parkinson's appears most often in people over the age of fifty. Some researchers believe that almost everyone would develop Parkinson's eventually if they lived long enough.

Most patients have what is called idiopathic Parkinson's disease. Idiopathic means the cause is unknown. People who develop the disease often want to link it to something they can identify. This might be a medical operation or extreme emotional tension.

Yet many doctors reject this idea of a direct link to Parkinson's. They point to people who have similar experiences and do not develop the disease.

There are several theories about the cause of Parkinson's, but none has ever been confirmed. Studies have shown a link between the disease and some chemical products. Two years ago, an American study found a link between Parkinson's and pesticides, like those used for killing insects. The study compared three hundred nineteen Parkinson's patients to more than two hundred family members.

In two thousand seven, a European study also showed a link between pesticide use and Parkinson's. This study found that serious head injuries also increased a person's risk.

Scientists at Aberdeen University in Scotland collected information about more than nine hundred people with Parkinson's or similar conditions. They compared this group to almost two thousand people without the disorder. All the people were asked about their use of pesticides, chemical fluids and metals like iron. The researchers also collected information about family history of the disease and head injuries.

Farm workers and people who said they often used pesticides had a forty-one percent greater risk of Parkinson's than others. The disease was also two and one-half times more common among people who had been knocked unconscious more than once in their lives. These people temporarily lost consciousness after suffering a blow to the head.

Another area of study is family genetics. There are examples of members of a family having the disease. The National Institutes of Health says about fifteen percent of people with Parkinson's have a family history of the disease. However, most cases involve people with no such family history.

A few years ago, researchers completed what they called the first large map to show genetic links with Parkinson's disease. The map identifies changes in genes that may increase the risk in some people.

Recently, a gene-testing company announced plans for a large genetic study of Parkinson's patients. The company, 23andme, was the idea of Ann Wojcicki. She is the wife of Sergey Brin, who helped create the Internet search engine Google.

Mister Brin has a gene that increases his risk of developing Parkinson's. His mother has the disease. The company is working with two not-for-profit groups. They hope to collect DNA from ten thousand Parkinson's patients. The goal is to search for common genes that may cause the disease.

There is no cure for Parkinson's disease. But improved treatments to ease the effects of the disease make it possible for many patients to live almost normal lives. People who have lost their ability to do many things are sometimes able to regain some of these abilities with treatment.

The most commonly used drug is levodopa combined with carbidopa. The National Institutes of Health says levodopa is a chemical found naturally in plants and animals. When it reaches the brain, levodopa is changed into dopamine, the

chemical that is lacking in people with the disease. Carbidopa delays the change in levodopa until after it reaches the brain.

Levodopa helps ease the symptoms of Parkinson's. But it does not prevent more changes in the brain that are caused by the disease.

Other drugs used to treat Parkinson's disease act like dopamine. They produce reactions in the nerve cells in the brain. They can be given alone or in combination with levodopa. Many of the possible side effects are similar to those linked with the use of levodopa. They include sleepiness, feeling sick or having bad dreams.

A surgical operation called deep-brain stimulation also is used to treat Parkinson's disease. Doctors use this treatment to shock the brain in areas that help send messages to the body. These areas can become blocked in Parkinson's patients. When this happens, the messages give misinformation to the body.

In deep brain stimulation, doctors make two small holes in the patient's head. Two thin, electrical wires are then placed in the brain. They are connected under the skin to another wire that leads to a small battery placed in the chest. The device supplies electricity.

Doctors do not know exactly how the brain stimulation works to help Parkinson's patients. But experts believe the electrical current might help activate nerve cells that are not working correctly.

Deep brain stimulation can reduce the need for levodopa and other drugs. It also helps to reduce symptoms such as shaking and slowness of movement.

Last year, researchers in the United States published a study that examined the effectiveness of deep brain stimulation. They found that the physical condition of Parkinson's patients often improves after they receive deep brain stimulation.

In fact, the patients who were treated reported an average gain of nearly five hours each day of good control of their symptoms. But brain stimulation was also shown to have more side effects than drug treatments.

Deep brain stimulation is not the answer for all Parkinson's patients. Doctors say it is best for patients whose medicines cause side effects or are not working. The treatment is not new. It was first approved for use in the United States in nineteen ninety-seven. Deep brain stimulation has been performed about forty thousand times throughout the world. In the United States, about three hundred medical centers offer the treatment to Parkinson's patients.

Scientists are also exploring other experimental treatments. Last year, President Obama ended restrictions on the use of federal money for studies of human embryonic stem cells.

Stem cells from very early embryos are able to grow into any tissue in the body. Scientists say such cells might be able to cure or treat diseases like Parkinson's. But opponents say stem cell experiments are wrong because human embryos are destroyed. They say this is just like destroying a human life.