

Parkinson's disease



Information on Parkinson's disease is frequently seen in the media. There are many famous people that live with the disease – Mohammed Ali, Michael J. Fox, Attorney General Janet Reno, and Pope John Paul to name a few. The debate on fetal cell implantation also brings attention to the disease.

What is Parkinson's disease?

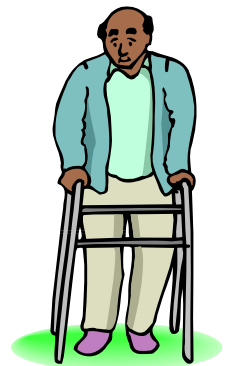
Parkinson's disease is a chronic (it persists over a long period of time) and progressive (the symptoms grow worse over time) neurological disease. The disease affects the nervous system, but only a very small area of the brain is actually affected. The cells in this area of the brain are the ones that produce dopamine, a chemical that transmits the signals within the brain that coordinate smooth and balanced muscle movement. The cells in the substantia nigra (the area of the brain affected) die with Parkinson's and it is estimated 80 percent or more of dopamine-producing cells are lost. The cause of the disease is not known, there is evidence that there is a genetic (or inherited) link for the disease. Other theories involving oxidative damage, environmental toxins, and accelerated aging have been considered as causes.

Who Gets Parkinson's Disease?

Parkinson's disease occurs most commonly in the middle-aged and elderly (although approximately 10 percent of sufferers are under age 40). Over 50,000 Americans are diagnosed with Parkinson's disease each year and 3 out of every 100 people over the age of 60 are affected. Men are slightly more likely to develop the disease than women. When the disease is diagnosed in people under 40, it is labeled as Young-Onset Parkinson's Disease.

What are the signs and symptoms of Parkinson's Disease?

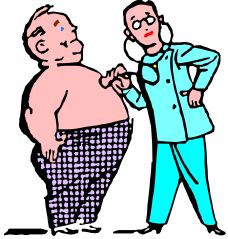
Early signs and symptoms of Parkinson's disease are usually mild and generally occur gradually. There may be fatigue or a general sense of uneasiness, with a slight tremor or difficulty standing. Some may notice that their speech has become softer or that their handwriting has changed. Generally, friends and family may begin to notice the changes before you do. As the disease progresses, it begins to interrupt daily activities. It is important to note that not all people with Parkinson's disease experience the full range of symptoms; in fact, most people with Parkinson's have mild, non-intrusive signs and symptoms. Below is a list of the more common signs and symptoms.



- Tremors – the involuntary and rhythmic movement of the hands, arms, legs and jaw and is the primary feature of Parkinson's disease. Tremors occur most often at rest and improve with movement that is intentional. Early in the disease the tremor may affect only one side of the body or one limb.
- Muscle rigidity - a stiffness of the muscles, most commonly occurring in the arms and legs. The muscles are unable to relax normally and make it difficult to move about.
- Bradykinesia is the gradual loss of automatic movement, including eye blinking (this leads to a blank stare) and decreased frequency of swallowing (which leads to drooling). This may occur suddenly where one minute the person is walking normally and the next they need help moving at all.
- Posture changes – a stooped and flexed posture occurs
- Changes in speech (it may become soft and difficult to hear) and handwriting (becomes smaller)
- Unsteady walk and loss of balance causing increased falls

- Depression
- Dementia or memory problems
- Voice and speech changes (voice will become softer with poor articulation)
- Changes in handwriting (smaller writing)
- Fatigue

How is it Diagnosed?



It is often very difficult to diagnose this disease, especially in its early stages. It is estimated that nearly 40% of people with the disease are not currently diagnosed. Part of the problem is that symptoms of Parkinson's disease mirror other diseases. There is not a blood test or x-ray that can diagnose Parkinson's disease. Presently, the diagnosis of Parkinson's is determined by a health care provider using the symptoms outlined above. Conventional criteria for diagnosis include: 1) the presence of two of the three primary symptoms (tremor, muscle rigidity and bradykinesia); 2) the absence of other neurological signs on examination, such as overactivity of reflexes, inability to coordinate voluntary muscular movements, or sensory loss; 3) the absence of a history of other possible causes of Parkinsonism, such as the use of tranquilizer drugs, head trauma or stroke; and 4) responsiveness to Parkinson's medications, such as Levodopa. A great deal of research is being done with the use of brain scans to determine their ability to assist in the diagnosis of Parkinson's.

Is There a Cure for Parkinson's Disease?

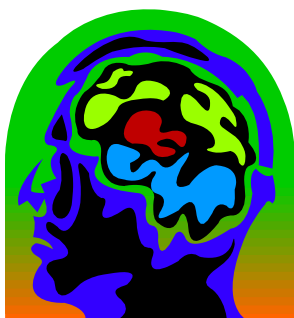
Although research is ongoing, to date there is no known cure or way to prevent Parkinson's disease. But, research in Parkinson's disease has made remarkable progress. There is very real hope that the causes, whether genetic or environmental, will be identified and the precise effects of these causes on brain function will be understood.

How is Parkinson's Disease treated?

Although no cure or prevention has been identified, recognizing the disease and starting proper treatment allows most people with the disease to live enjoyable, fulfilling lives. The proper treatment may involve a "team effort". This health care team may include a neurologist, occupational and physical therapists, dietician, speech therapist, social work, counselor, your primary care provider, your family, and of course the most important person, the one with the disease. Treatment generally starts with prescribed medications. Levodopa is the drug used most commonly as a starting point. It is effective in treating 90% of Parkinson's patients. It does not slow the progression of the disease and has many side effects. A new medication introduced in 2008, rasagiline (Azilect) is being reported as the first disease modifying medication. The most up to date information shows that those newly diagnosed patients placed on this medication early in the disease do better than those for whom treatment was delayed six months, this meets the criteria of the FDA for disease modifying medication. Some people cannot tolerate the medications or they are ineffective and procedures may be indicated. Young onset Parkinson's patients often respond best to procedures.



What are the procedures?



- **Deep brain stimulation:** this is a procedure that uses electrical stimulation to reduce the symptoms of tremors, rigidity, slowness of movement, stiffness, and gait problems. Electrodes are placed in the deep brain structures and connected by wires to a type of pacemaker device implanted under the skin of the chest, below the collarbone. This procedure is done without destroying parts of the brain. Deep brain stimulation is no longer an experimental treatment and has been done for the treatment of Parkinson's disease since 1997.

- **Pallidotomy:** this procedure uses a probe and radio waves to heat the brain tissue and destroy it. The area of the brain that is targeted is about the size of a tic tac. The goal of pallidotomy is to eliminate the motor manifestations of Parkinson's Disease.
- **Thalamotomy:** is a similar procedure to pallidotomy, but targets a different area of the brain. The goal of thalamotomy is to permanently stop tremors. This is an effective treatment for tremor only. It does not treat any other symptoms of Parkinson's Disease.

Are any alternative treatments available?

- **Diet:** While there is currently no proof that any specific dietary factor is beneficial, a normal, healthy diet can promote overall well-being for PD patients just as it would for anyone else. Eating a fiber-rich diet and drinking plenty of fluids also can help alleviate constipation. A high protein diet, however, may limit the effectiveness of the medicine, levodopa (used to treat the symptoms).
- **Vitamin E:** Some experts have suggested that 800 IU to 1,200 IU per day of vitamin E can help alleviate some symptoms of Parkinson's disease.
- **Guided Imagery:** there has been some documented evidence of the use of guided imagery helping with involuntary movements.
- **Exercise:** Exercise can help people with PD improve their mobility and flexibility. Exercises will not stop disease progression, but some recent animal research demonstrates a slowing of the disease progression with mild aerobic exercise. Exercises also improve balance, helping people minimize gait problems, and can strengthen certain muscles so that people can speak and swallow better.
- **Other disciplines:** There are many testimonials from patients who have had success using acupuncture, chiropractic, yoga, hypnosis, biofeedback, aromatherapy, relaxation, and massage.

What research is being done currently?



Research in Parkinson's disease has provided real hope for new treatments or a cure. A lot of the research is attempting to determine the cause of the disease, be it genetic or environmental. Recently on NPR a researcher stated that they now believe Parkinson's has a genetic basis, but requires something in the environment to "turn it on", he discussed manganese as one of those environmental poisonings, there is also a chemical in heroin that may turn on the genes responsible for Parkinson's (reported February 1, 2009). It is thought that when the cause is understood, a possible treatment or cure may be easier to find.

The treatments currently being studied involve new medications, neural growth factor, fetal cell transplantation, the use of stem cells, and gene therapy. One of the most promising involves the transplantation of fetal dopamine neurons (tissue transplant) into the brains of people with Parkinson's disease. The hope is that these cells will be able to re-grow the damaged dopamine-producing nerve cells.

- **Neural growth factor:** NGF is a chemical that stimulates nerve to grow, if the dormant cells needed to produce dopamine could be revived, it's possible symptoms could be decreased.
- **Fetal Cell Transplantation:** This is an incredibly controversial area of research. This procedure implants fetal cells into one of the deep structures of the brain, causing dopamine production to start up. However, in some people there has been too much dopamine produced, resulting in an increase in severe involuntary movements. This combined with the moral and ethical objections to the use of fetal cells has led researchers to explore other options. Another approach to treating PD is to implant cells to replace those lost in the disease. Researchers are conducting clinical trials of a cell therapy in which human retinal epithelial cells attached to microscopic gelatin beads are implanted into the brains of people with advanced PD. The retinal epithelial cells produce levodopa. The investigators hope that this therapy will enhance brain levels of dopamine.

- Stem cell therapy: Stem cells are the parent cells of all body tissues, so they can turn into any type of cell. It is the goal of researchers to take stem cells and learn to make them into specific types of cells – like the dopamine-producing cells that have been destroyed in Parkinson's. There is a tremendous amount of moral and ethical controversy surrounding stem cell research, similar to that of fetal cell transplantation.
- Gene Research: Investigators are looking for the code proteins responsible for producing dopamine – if they could be found and controlled, it is believed that the symptoms of Parkinson's could be minimized or prevented.
- Immune system modification: Researchers have used a study vaccine in the mice model for parkinsons. This reduced the amount of degeneration in the brain and decreased inflammation. These are very preliminary studies.

Web resources:

http://www.ninds.nih.gov/disorders/parkinsons_disease/detail_parkinsons_disease.htm

<http://www.parkinson.org>

*The information provided in this column is offered as a community service about health-care issues and is not a substitute for individual consultation. Advice on individual problems should be obtained from your personal health care provider. This information is based on research by the author and represents her interpretation of the literature. If you have any suggestions for future columns please feel free to let the paper editor know.