

Parkinson's disease business plan examples

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Parkinson's disease is the 2nd most common degenerative disorder after Alzheimer's disease. It is the most common disorder that affects movement. Its symptoms include tremors while at rest, slowness, stiffness and impaired balance. Progression of the disease may affect speech, walking and the performance of simple tasks. The Progression and the severity of the disease vary from one person to another. While most patients live long productive lives, the disease progresses much faster in other patients leading to disability. About one million people have Parkinson's disease in the United States and about 5 million around the world. 1% of people of age 60 years and about 4% of people of age 80 years suffer Parkinson's disease. The disease is most common among older adults but an early onset age of between 21 and 40 years old exists.

Parkinson's disease occurs when dopamine secreting cells in the substantia nigra degenerate and stop secreting dopamine. Dopamine acts as neurotransmitter between the substantia nigra and the corpus striatum. It produces smooth controlled movements. A low level of dopamine in the substantia nigra leads to ineffective communication with the corpus striatum and the result is impaired movement. The rate of progression of the disease is proportional to the rate of drop in the level of dopamine. This is in turn reflected by the severity of symptoms manifested by the patient. The cause of degeneration of dopamine secreting cells remains unknown. However, several factors have been identified to contribute to the degeneration. These include inflammation, stress and dysfunctional cellular processes.

The risk factors that contribute to the development of the disease are evident. Advancing age is one of the contributing factors. The disease

manifests more among older adults compared to younger adults. Therefore, aging increases the risk of Parkinson's disease. Researchers argue that environmental and genetic factors cause neural damage, and this gets worse with age.

Sex is another contributing factor. Parkinson's disease is more common among men than women. This has been attributed to the possible fact that men are more exposed to risk factors like head trauma or exposure to toxins. Another theory suggests that estrogen protects the brain from neural damage. A family history of Parkinson's disease increases the chances of one developing the disease. This factor supports the belief that a genetic link exists in the development of the disease.

A decrease in the levels of estrogen poses a greater risk in the development of the disease. Post-menopausal women with no hormonal replacement therapy are also more likely to develop the disease. Environmental toxin exposure increases the risk of Parkinson's disease. Agricultural toxins such as herbicides or pesticides have been suggested to inhibit the production of dopamine. Therefore, the prevalence rates of Parkinson's disease are greater among farmers than other occupations.

An international study by Mayo Clinic found that alpha-synuclein gene is a contributing factor to the development of Parkinson's disease. The risk of Parkinson's disease is 1.5 times greater in those people with a more active gene. Alpha-synuclein suppressing therapies have been used to slow the progression of the disease. A study found out that vitamin deficient mice developed severe symptoms of Parkinson's disease. Mice with normal levels of the vitamin did not show any symptoms of the disease. Head traumas and

injuries to the neck have been linked to Parkinson's disease. A study of sixty patients with Parkinson's disease revealed that most of them had evidence of head injuries.

Patients with Parkinson's disease show the following symptoms. Tremors occur as an early symptom. It may begin on one finger before spreading to the whole arm. Bradykinesia or slow movement is experienced. Akinesia normally begins in the neck and legs. The muscles stiffen making the body rigid. As the disease progresses, the patient loses his ability to coordinate his balance. Other symptoms include low blood pressure, temperature sensitivity, depression, and digestion problems. The common external characteristics of Parkinson's disease patients include rest tremors, stooped posture, blank stare and slow shuffle.

Parkinson's disease has five stages of development. The stage one is the asymptomatic stage. Patients in this stage express mild symptoms like tremors or the shaking one limb. Family members may notice the following symptoms from the patient, loss of balance and poor posture. In the second stage, patients manifest bilateral symptoms. Both limbs and sides of the body are affected. Patients experience difficulties in balance and walking. Performing physical tasks also becomes a problem. The third stage symptoms can be severe. The patients may be unable to walk or stand. In addition, they also express slow movements. The fourth stage has severe symptoms. In addition to difficulty in walking, the patients express bradykinesia and rigidity. The patients need care because they cannot live on their own. In the fifth or the final stage, the patient is always unable to walk or stand. They require nursing care to continue living.

Medication of Parkinson's disease may commence in stage I or stage II. The disease is treated by neurologists. Less powerful medications are used. These include anticholinergic drugs such as selegiline, and dopamine agonists such as ropinirole or pramipexole. Dopamine agonists activate dopamine receptor. Therefore, the brain does not require dopamine to activate the receptor. The development of significant symptoms occurs in stages three, four and five. Levodopa is normally prescribed in stage III. It is the most commonly prescribed drug for Parkinson's disease. It raises the level of dopamine. Initial dopamine injections failed to work because it does not cross the blood brain barrier. L-Dopa was used since it crosses the blood-brain barrier and can be converted to dopamine in the brain. Catecol-O-methyltransferase inhibitors such as entacapone and tolcapone are also used. These drugs raise the bioavailability of L-Dopa. The inhibitors decrease the rate of breakdown of L-Dopa. This gives L-Dopa more time to cross the blood brain barrier to be converted to dopamine in the brain. In cases where the administration of drugs fails or their side effects become intolerable, surgery is usually an alternative. In this process, a deep brain stimulator is implanted to directly stimulate the dopamine receptors.

The current drugs used in the management of Parkinson's disease have a set of drawbacks. Levodopa may be very effective in during the first years of administration, after which it begins to wear off. In such a case, an "on-off syndrome" occurs where the patient may be fairly mobile at one point and severely impaired at another point. This is due to the fluctuation of dopamine levels in the brain. Other side effects are nausea and flushing. Dopamine replacement drugs such as sinemet may induce diarrhea, vomiting, nausea,

and dizziness. High doses may induce sudden involuntary movements.

Dopamine agonists may cause hallucinations, involuntary movements and low blood pressure.

Parkinson's disease does not have a specific diagnostic test. The early stages of the disease are difficult to diagnose because of the less symptoms manifested. Techniques used for testing include neuroimaging, genetic testing, olfactory testing, autonomic system testing, and neurophysiological testing. Neuroimaging is done using single-photon emission computed tomography. It measures the amount of neurons that release dopamine. PET scans are also done to analyze the brain of a patient. Olfactory testing is done because Parkinson's disease patients have an impaired olfactory system. The autonomic nervous system regulates the digestive, respiratory and the cardiovascular system. In addition, it controls activities such as salivation, pupil dilatation and perspiration. Patients with Parkinson's disease have impairments in these functions. The autonomic nervous system testing done includes, examination of reflexes, breathing, thermoregulation and breathing.

Clinical Management Flow Chart for Parkinson's Disease

The prevalence of Parkinson's disease in the United States has been estimated to be between 349, 000 and 1. 7 million. Predictions made suggest that the rate will double by 2030. The medications used cannot cure the disease and only manage it. The disease, therefore affects the patients, care givers and the health system. The progression of the disease limits the physical activity of the patient. Their ability to provide self-care decreases. This increases the burden on the health care resources including the unpaid

caregivers. The NINDS reported, in 2004, that the annual cost for neurological disorders and stroke in the United States was \$6 billion. It was also reported that in a year, 11% of patients with Parkinson's disease will spend a year in an institution, 23% will have an acute problem, 54% will experience chronic problems managed on the basis of outpatient and 12% will succumb to the condition. The hospital costs of treating one patient were around \$24, 000 per year. The inclusion of costs of post-acute care in hospitalized patients increased the cost of treatment to \$39, 096. The annual chronic medical care costs were approximately \$3573. The cost of transport and medical equipment increased this value to \$5363. The total cost of Parkinson's disease management in the United States was estimated at \$10. 78 million. The direct costs of treatment accounted for 58% of the total. 63% (\$1. 47 billion) of the direct costs were accounted for by Parkinson's disease medications and nursing home care. The indirect costs were estimated at \$4. 56 billion. They were accounted for by productivity loss by patients with Parkinson's disease and unpaid caregivers.

Levodopa has been associated with on-off syndrome. Research is being done to develop a drug that provides a steady level of levodopa in the brain. Studies are also being done to develop more effective dopamine agonists. For instance, drugs such as pramipexole, apomorphine and ropinirole are new dopamine agonists currently available in the market. The scientists' aim is to produce more tolerable agonists, which are more effective in relieving the symptoms. Research is also ongoing to develop COMT and MAO-B inhibitors that will be more effective and tolerable than the current drugs used.

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