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Parkinson's disease and deep brain stimulation(DBS)

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Parkinson's disease (PD) is a hypokinetic movement disorder characterized by bradykinesia/akinesia, resting tremor and muscle rigidity. These motor symptoms are mainly caused by degeneration of dopaminergic neurons in the substantia nigra. Since 1967, when L-dopa was shown to effective for amelioration of the motor symptoms of PD, dopamine replacement therapy remains the mainstay of medical therapy for PD. On the other hand, stereotaxic surgery for PD was developed in 1948, leading to the findings that targeted destruction of the globus pallidus pars interna (GPi) and the intremedialateral nucleus of thalamus (Vim) represent effective therapies for bradykinesia/akinesia and tremor, respectively. In 1980s, deep brain stimulation (DBS), in which electrode is implanted into deep structures of the brain, was developed and shown to be effective as well as surgical destruction. In 90s, the subthalamic nucleus was demonstrated to be a novel target for DBS. Currently STN-DBS and GPi-DBS constitute standard therapies for patients with advanced PD, whose motor complications associated with long-time L-dopa treatment are not properly managed. For advanced PD, on the other hand, other devise-aided therapies(DAT) including L-dopa/carbidopa intestinal gel could be alternative options. The current indication and future prospect of DBS in the PD therapy will be discussed.