**WHEN SHOULD DBS FOR PD BE INITIATED?**

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DBS for PD should be initiated early. The four major signs of PD are: (1) *tremor*; (2) *rigidity* (resistance to passive movements); (3) *bradykinesia* (slowness in movements and gait); and (4) *postural instability* (trouble with balance and posture). Each patient differs in the severity of each component of PD, and the pace of clinical progression of the disease. Therefore therapy for PD should be tailored to the progression of the disease in an individual patient and no therapy should be ruled out or "saved" until it is too late.

For patients with early PD, levodopa (Sinemet) and other antiparkinsonian medications are usually effective for maintaining a good quality of life. As the disorder progresses, however, medications can produce disabling side effects. Many patients on long-term levodopa therapy can develop troublesome *dyskinesias*, abnormal involuntary movements that often cause the limbs and body to writhe or jump. In addition, their dose of levodopa no longer lasts as long as it once did. This may lead to "*on-off fluctuations*," a condition in which the ability to control movement changes unpredictably between a mobile ("on") state and an immobile ("off") state. When patients no longer have an acceptable quality of life due to these shortcomings of medical therapy, surgical treatment should be considered.

The major benefit of DBS surgery for PD is that it can improve movement and reduce drug side effects. DBS "smoothes out" the on-off fluctuations between too much and too little movement and provides better function during more of the day. DBS may also allow reduction in antiparkinsonian medications. The primary risks of DBS surgery are bleeding and infection. The most serious potential risk is bleeding in the brain, producing a stroke. This risk is approximately 3%, with about 1% of patients having a permanent disability. Infection occurs in about 4% of patients. Infection is usually not life-threatening but may require removal of the DBS system.

Most importantly, class 1 evidence indicates that DBS improves outcome and quality of life for patients with Parkinson's disease. Therefore it is important to consider DBS for all patients with PD, including early PD once medications lose effectiveness. DBS should also be performed while a PD patient still has intact intellectual function and memory, and therefore the longer one waits to do DBS in the course of the disease (1) the greater likelihood of postoperative cognitive deterioration; and (2) the less cumulative lifelong benefit of DBS therapy.

Therefore, DBS for PD should be initiated early.