International Parkinson and Movement Disorder Society

Deep Brain Stimulation for Parkinson's Disease: Essential Facts for Patients

What Are the Motor Symptoms of Advanced Parkinson's Disease?

When patients first start taking their Parkinson's disease (PD) medicines, the benefits usually last throughout the whole day. However, as PD worsens, the patient may notice that the benefit from the medicine doesn't last until the next dose, this is called "wearing off". When the medicine wears off, PD symptoms such as tremor, slowness, and difficulty walking may reappear. When the medication is taken again the symptoms improve again and the good period is called an "ON" period while the bad period is called "OFF". Patients may also develop involuntary movements (twisting and turning) called dyskinesias, which may be troublesome.

What Can Help Advanced Disease?

Your doctor can adjust your medication dose and the timing of the medications to try to reduce OFF periods and dyskinesias. In some patients Deep Brain Stimulation (DBS) is used to treat patients with OFF periods and/or dyskinesia that are not controlled with changes in medication. DBS is a type of brain surgery where a thin, insulated wire (also called an electrode) is placed deep in the brain. The electrode is connected to a pacemaker-like device that is placed under the skin in the chest. The device sends electrical signals to an area in the brain that controls movement. The stimulation of this brain area can improve OFF periods and can reduce dyskinesias.

Who Should Consider DBS?

When a PD patient still has a good benefit from medication but also bad OFF periods and/or troublesome dyskinesias, despite changes in the medication dosing and timing, then DBS may be an option. Good candidates also need good social support.

Patients who may not be good candidates include those with: Serious memory problems, hallucinations, severe depression and significant imbalance when walking even when ON.

How Are Patients Chosen for DBS?

Your doctor should refer you to a specialized neurosurgical center for a DBS consultation. In most DBS centers, the evaluation will include:

- An evaluation by a neurologist who specializes in treating PD
- A brain scan (MRI or CT) to be sure there are no brain changes that might prevent surgery
- A consultation with a neurosurgeon who performs the DBS surgery
- A thorough evaluation including memory and thinking

Is it Safe?

In general, DBS is a safe procedure. However, there are potential serious side effects such as bleeding or stroke at the time of surgery. There are also potential side effects from the stimulation (that may be reduced by changing the stimulator settings.) Most side effects are mild and temporary, such as: Weight gain, difficulty finding words, decreased quality of speech and pacemakers or electrode infections. However, there have been reports of an increased risk of suicide.

What Is the Procedure?

The DBS surgical procedure usually takes several hours. You will be awake most of the time. For most patients, one electrode is placed in each side of the brain. A frame holds your head (skull) during surgery so the electrode can be placed precisely. A small hole is drilled in each side of the skull so the electrodes can be placed. Afterward, each of the two electrode wires is tunneled through the skin and connected to a pacemaker-like device (called a neurostimulator) that is placed under the skin in the chest.

What Happens After the Procedure?

After DBS, your doctor will need to determine the best adjustment for stimulation settings with a device that communicates with the neurostimulator and your medication. Usually the optimal adjustment is reached three to six months after the procedure.

What Are the Short- and Medium-Term Results?

Patients may experience these benefits with DBS treatment:

- Shorter time spent in the OFF period
- Shorter length and severity of dyskinesia
- Lower medication doses
- Improved non-movement symptoms such as pain, sadness, or sleep
- Improved quality of life

What are the Long-Term Results?

Over time, DBS can continue to improve ON periods and dyskinesias. However, DBS doesn't cure PD or stop its progression.

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