

# Movement Disorders Program

# Deep Brain Stimulation

## What is Deep Brain Stimulation?

The goal of deep brain stimulation (DBS) is to regulate the electrical activity in certain brain areas to improve the symptoms of your movement disorder. Currently, DBS is approved by the US Food and Drug Administration (FDA) for the treatment of medically refractory (resistant to treatment) essential tremor (ET), Parkinson's disease (PD) and dystonia. DBS is not a cure for your movement disorder, but it is intended to decrease many of the symptoms that have not responded well to medicines.

## How is DBS performed?

DBS is a type of brain surgery where a pacemaker-like battery pack is implanted in your chest. Wires connected to the battery pack are then placed deep within certain brain structures.

## What are the risks of DBS?

The most serious risk of DBS is bleeding into the brain causing a stroke or death. Stroke occurs in under one percent of patients. Other rare, less serious complications include infection, malfunction of the stimulator and unintended movement of the implant. The DBS system may need replacing if these problems occur.

## Movement disorders we treat with DBS

At Vanderbilt, we use DBS to help treat the following movement disorders:

- Dystonia
- Essential tremor
- Parkinson's disease

## Three requirements for DBS

- You have taken a reasonable course of medicines as determined by your movement disorder neurologist.
- Despite medicines, you are significantly disabled by your disorder but in good health for surgery.
- You are willing and able to participate in the programming of the device. You will need to travel to programming sessions and provide feedback.

## What is the surgical process?

### Pre-Surgical Work-Up

If you meet the requirements as determined by your initial neurological evaluation, you will then undergo neuropsychological testing to assess your memory and mood, as well as a motor skills assessment. These tests will occur at a separate visit. The DBS team will evaluate your results.

### Surgery Stages

Typically, stages 1 to 3 will happen one week apart.

- **Stage 1:** For surgical planning, bone markers (small screws) are placed in your skull, followed by a special MRI and/or CT scan on the same day.
- **Stage 2:** The DBS (brain) electrodes are placed at the optimal target. You will be awake and off most medicines during this procedure so your symptoms will not be masked by sleep. You will stay overnight.
- **Stage 3:** DBS battery implant and connection to the brain wire occur. Typically, the battery is placed below the collar bone, just like a pacemaker. (*Same day procedure*)
- **Stage 4:** The initial programming of stimulators will occur four to six weeks after Stage 2.



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## What to Expect

### **Before Surgery**

Completed over multiple, separate visits over several months.

- Movement disorders evaluation by a neurologist
- Pre-surgical evaluation: Motor skills assessment and neuropsychological evaluation
- Multidisciplinary team case conference
- Neurosurgical evaluation
- Insurance approval
- Anesthesia evaluation

### **Surgery**

- **Stage 1:** MRI with bone markers (*Outpatient*)
- **Stage 2 A/B:** Awake implantation of DBS electrodes, both sides if applicable (*Inpatient*)
- **Stage 3:** Implantation of battery pack (*Outpatient*)

### **After Surgery**

- Initial programming
- Checking the surgical wounds
- CT scan of brain
- Follow-up for adjustments, as needed

## Movement Disorders Program

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