



## Deep Brain Stimulation or DBS

Deep brain stimulation (DBS) involves the use of an implantable system to provide stimulation to specific areas of the brain to control or lessen neurologic symptoms. Currently DBS is used for Parkinson's Disease and Essential Tremor. Additional applications are being investigated in some centers for other conditions such as dystonia.

Some patients with Parkinson's disease may be candidates for stimulation of the STN (sub thalamic nucleus) to help with reduction in symptoms. Patients with essential tremor may be candidates for stimulation of the VIM area of the brain.

Patients who are candidates have a confirmed diagnosis of Dopa (Sinemet) Responsive Parkinson's Disease, have had Parkinson's symptoms for at least 5 years, are not receiving adequate symptom management by medications alone or medication side effects are not well tolerated, and do not have any cognitive decline or dementia related to their disease.

Patients will undergo an evaluation process tailored to their needs or concerns which may include consult with a neurologist, if not already done; consult with their primary physician to make sure they can safely undergo the procedure; neuropsychology evaluation; MRI of the brain; and consult with the neurosurgeon regarding the procedure.

The implantation is a two stage process for those patients who choose to pursue this treatment. The first stage involves placement of two electrodes into the brain using stereotactic (mapping of the brain) techniques. You will come into the hospital the morning of your procedure after washing your hair with Hibiclens Soap the night before. You will not take any of your Parkinson Medications that morning, and should have nothing to eat or drink after midnight. In the preoperative area, the physician will secure a special frame to your head using some local anesthetic and pins. This frame provides markers to help us "map" your brain. You will then be taken to the MRI suite to have an MRI of your head with the frame in place. This image is converted to computerized data giving the physician detailed anatomy of your brain to plan for placement of the electrodes into a part of the brain called the sub-thalamic nucleus (STN). For patients who cannot have an MRI, a CT scan can be used.

You will have sedation for the procedure of electrode placement. A catheter will be placed into your bladder during the procedure as you will not be able to go to the bathroom. When the electrode has been placed, we will test (stimulate) it to see its effect on your rigidity and tremor to help assure proper placement. The incision made to place the electrodes will be closed with dissolvable stitches. You may have some awareness of the activities going on in the operating room as only light sedation is used.

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The staff will try to make you as comfortable as possible during the procedure. Once it is complete you will go to a regular hospital room. You may be in the hospital for 1-2 days after this part of the procedure. You may notice some improvement in your symptoms after this part of the procedure even without the electrical stimulation battery placed. It takes about 2 weeks for healing around the electrodes to occur.

The second stage of the procedure involves an outpatient procedure 2-3 weeks after the first stage to place the stimulator (battery pack). These are placed along one side on the front of your chest/abdomen. If you have a pacemaker, they will be placed on the other side. You will be asleep (general anesthesia) for this procedure, which takes about 1 hour. After you are awake and ready to leave the hospital, you will come to the clinic for programming of the stimulator (battery pack). You will not take your Parkinson's medication this day until after programming is done. Please bring them with you to take when directed to do so. The stimulator will be tested and we will look for effects of different settings to determine a good starting point for you.

You will see your neurologist about 2 weeks later for further adjustments and dosage of your medications. The process of adjusting the stimulator and medications to find the best plan for you can take up to 3-6 months. You will be asked to keep a log of your symptoms and medication usage. Most patients will be able to reduce their medications by up to 50%, and receive about 6 additional hours of "on" time each day with DBS. The best we can achieve with DBS would be equivalent to your best "on time" with medications.

You will receive an ID card from Medtronic Neurological about your Activa System. You will need to avoid magnets and security sensors, and will be given a complete list of precautions. Patients are also given a hand held Access Review to allow them to turn the battery pack off and on, as well as assess if it is working. The battery packs last 2-5 years depending on the degree of stimulation required for that patient. Battery packs are replaced when they run out as an outpatient procedure.

In considering any surgery, the risks must be discussed. General risks include infection, risks of anesthesia, bleeding, failure to relieve the symptoms, difficulty with wound healing. In DBS risks of bleeding are low, but can cause significant neurological injury such as stroke, coma or death. Infection risks are less than 10% but often the entire system must be removed.

The general information included is intended to address the common questions and concerns of our patients. You should address any specific questions about your condition directly with your physician or physician assistant by calling our office at 402-398-9243.

