Deep Brain Stimulation Surgery  
(Frame-based)  

Patient Information Booklet  
What are the benefits and risks of this treatment for me?  
Am I a good candidate? What should I expect before, during and after surgery?
About Deep Brain Stimulation

What is deep brain stimulation (DBS)?
Deep brain stimulation is a surgical treatment using electrical stimulation of specific brain areas. It is utilized for Parkinson’s disease, essential tremor, and dystonia (sustained muscle contractions causing twisting or repetitive movements and postures).

What symptoms can DBS improve?
The goal of DBS is to improve the control of movement or other symptoms. It may result in a reduction of tremor, rigidity, dyskinesia (impaired ability to control movements), or dystonia. DBS is not a cure for any disease and has not been shown to prevent the progression of disease. The goal of the surgery is to help control the symptoms of your condition and provide you with a better quality of life.

What movement disorders are treatable with DBS?
DBS is now the standard for surgical treatment of several movement disorders including essential tremor, Parkinson’s disease and generalized dystonia.

How does DBS work?
DBS may be used on one side of the brain or two based on the symptoms. A deep brain stimulator consists of electrode, a lead extender, and a generator. During DBS surgery, the electrode is placed into the brain through a small opening in the skull. It is attached under the skin via a lead extender to a generator placed in the chest just below the collarbone. All parts of the system are below the skin. The generator is similar to a heart pacemaker. It allows for electrical stimulation of specific brain areas involved in movement disorders.

What is the advantage of DBS compared to previous surgical techniques?
Older surgical approaches to movement disorders involved destruction of brain tissue and were irreversible. In contrast, DBS is reversible because electrodes can be removed. DBS also allows for flexibility in the treatment of neurological conditions because the generator can be adjusted.

What are the risks?
The most serious risk is bleeding into the brain, causing stroke. Less than 1% of patients experience a stroke. The effects of a stroke can include paralysis, loss of speech, coma, or even death. There is also some chance (10%) of less serious complications. These may include infection, malfunction of the stimulator, and movement of the electrode or generator. Any of these problems may require removal of part or all of the DBS system.

Am I a good candidate for DBS Surgery?
In general, the following conditions should be met:

• You have tried a reasonable course of medications, as determined by a movement disorder neurologist.
• You are significantly disabled from your disease.
• You are in reasonably good health.
• You do not require routine MRI scans of the body.
• You can participate in the programming of the device once implanted. This requires you to provide feedback during programming sessions and to attend clinic visits.
• You have a good support network of family and friends.

Prior to Surgery

I’m ready to proceed: what happens next to determine whether DBS surgery will take place?

• You must have a physical exam to make sure you do not have any health problems that would affect the surgery. Bring a list of your medicines and prescriptions with you to this exam.
• Your primary care physician must send your medical records and radiology scans to the office before your DBS consult appointment.
• Additional tests such as head MRI and neuropsychological testing may also be ordered to help determine whether you are a good candidate for this surgery.
• If you are a good candidate for the DBS implant, your surgery may take a few months to schedule.
• Once you’ve decided to proceed with the surgery, notify the Neurosurgery office, either at the time of the clinic visit or by calling (608) 263-0485.
• If you wish to talk with someone who has been through this, we will give you the name and phone number of a person to call. Call (608) 263-0485 to learn more about this service.
• We will ask you to permit us to videotape you during these clinic visits. The videos will be used to compare the changes before and after DBS placement.
• You may be asked to take part in research studies. These will be explained to you during your first visit. You may choose to take part or not.

What should I do in the days leading up to surgery?

• Stop taking Aspirin, Excedrin®, Ibuprofen, Aleve®, Advil®, and Motrin® 14 days before your surgery date.
• Stop taking vitamins and herbal supplements seven days before your surgery date.
• Plan to shampoo and bathe with an antibacterial soap the night before and the morning of surgery to lessen the risk of infection.

• Do not eat or drink after midnight. You may drink only clear liquids up to four hours before the surgery. Clear liquids include water, soda, coffee and tea (no creamer), clear broths, juices without pulp or solid material (apple juice), and popsicles.

• During your pre-surgery visit, you will be told which medicines to take the morning of surgery. If you take blood pressure medicine, make sure to talk to your surgeon about your blood pressure medications.

Where do I arrive for the surgery?
Arrival at University of Wisconsin Hospital and Clinics for your first DBS surgery depends on your condition: (exact times will be determined by your care team prior to admission)

• Patients with Parkinson’s disease:
  On the day before surgery, report to the Admissions Department in the morning for the first electrode placement. You will be admitted to the hospital and your Parkinson’s medication will be withdrawn in the evening.

  If a second electrode placement is required, arrive at the Admissions Department on the day before surgery (afternoon). You will be escorted to the Neuroscience unit (D6/4) and stay in a private room the first night. Your Parkinson’s medications will be withdrawn in the evening.

• Other patients:
  Arrive to the hospital early on the day of surgery. You need to report directly to the First Day Surgery (E5/3). Enter the main hospital entrance and follow “Main Street” to the left to the “D” elevators. Take the “D” elevator to the 3rd floor, turn left and follow the signs to the First Day Surgery (FDS) entrance.

Surgery
In general, what happens during the DBS surgery process?
Placement of the DBS implant is performed in stages: first, electrode(s) placement; second, generator placement.

First, the electrode(s) will be placed in your brain. You and your physician will decide if a second electrode is needed. You will be awake for this procedure. After the surgery you will spend the first night in an intensive care unit (ICU). You will be on a general care unit for one or two more days before you go home.

Second, the generator will be placed in your chest. You will be asleep for the procedure. You will go to the general care floor after the placement and may be able to go home the next day. The device will not be turned on until you return to the Neurology Movement Disorders Clinic for programming about two weeks after your surgery.

What happens during the electrode placement?
• You will be taken to the Operating Room (OR).
• You will be mildly sedated.
• A frame will be placed around your head after numbing medicine is injected into the skin. The reason for the frame is to keep your head from moving and insure proper electrode placement.
• After the frame is placed, you will be taken for a CT scan.
• You will be returned to the OR and placed in a reclining position.
• You will have your hair clipped in the OR. Only the hair around the incision will be clipped to enhance access and create a sterile field for the operation.
• Your surgeon will review the merged scans and complete final planning for placing the electrode.
• Drapes will be placed around your head and you will be sedated for the initial incisions.
• During the sound recording phase you will be asked to perform tasks involving motor movement. Sound recordings will be done as the electrode is placed to assure ideal placement.
• After the surgery is completed, you will go to the recovery room and then spend the first night following the surgery in the Neurosurgical Intensive Care Unit.

What happens during generator placement?
A nurse from the First Day Surgery Unit will call you the day before surgery between 10 am - 2 pm to tell you what time to arrive on the day of surgery.

Plan to shampoo and bathe with an antibacterial soap the morning before and the morning of surgery to help lessen the risk of infection. Do not eat or drink after midnight. You should take your Parkinson’s or tremor medicine before surgery. Take all medicines with small sips of water only.

On the day of this surgery, all patients should report to the First Day Surgery (E5/3) two hours prior to their surgery time.
You will be asleep for the generator placement which will take 2–3 hours. An incision will be made in your chest. The incision behind your ear will be reopened. The doctor will insert the generator into your chest, bring the wire behind your ear down your neck to your chest, and connect the two devices. Once this is done, all parts will be under the skin.

**When will I have generator placement surgery?**

Usually about 1-2 weeks following the electrode placement surgery, you will return for a surgery for placement of the generator(s) in your chest.

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**Post-Surgery**

**What should I do at home after electrode(s) placement surgery?**

After the electrode placement surgery you will have surgical dressings on top of your head and behind your ear. You may notice a lump near the incision behind your ear. This is a cap at the end of the electrode which will be taken out during the generator placement surgery. The head dressings should remain on for two days after surgery. After that, the dressing is not needed.

You may shower but should not submerge your head under water for five days after the surgery. You may use a gentle shampoo such as baby shampoo and then pat the incision dry. Do not use hair conditioner. You should not use a comb or brush near the incision.

You may have some oozing of blood from the incision sites especially right after the procedure and after removing stitches. Clean the sites with normal saline. Applying firm pressure with a sterile gauze pad or clean washcloth for approximately 5-10 minutes can stop this bleeding. In the unlikely event you are unable to stop the bleeding, go to the emergency room.

**Other post-surgery care recommendations:**

- Do not apply any ointments or creams to the incision.
- Avoid driving until after your two week follow-up visit. Do not drive while taking narcotics.
- Do not lift items weighing more than ten pounds (roughly a gallon of milk).
- Walk as much as you can each day.
- Avoid bending forward with your head down for at least two weeks.
- You can wear a hat, scarf or turban after the surgery to cover the head incision from the sun 4-6 weeks after the surgery to minimize scarring.
- Use Tylenol® for any mild discomfort that you experience during this time.
- Watch for these signs and symptoms and call the neurosurgery contact numbers provided in this document if needed:
  - Increased drainage from the incision sites.
  - Change in the amount of pain at the sites.
  - Temperature greater than 101.5°F by mouth.

**What happens after the generator placement surgery?**

Two weeks after your last surgery you will come in to the Neurosurgery Clinic (F4/2) for incision check/suture removal visit.

2-4 weeks following the surgeries, the programming of the device will begin. This is done in the Neurology Movement Disorders Clinic (H elevator, 4th Floor). It may take 3-6 months to adjust the device for optimal symptom management.

**What else is affected by DBS surgery?**

MRI imaging should not be done once DBS electrodes have been placed. Many times CT scans, X-rays or other studies are acceptable substitutes for MRI studies.

**Who do I call with post-surgery questions or issues?**

- If it is an emergency, call 911.
- If you have general questions about your DBS surgery, call the Neurosurgery Clinic: (608) 263-7502.
- If you have questions about your DBS programming or medications for Parkinson’s, essential tremor or dystonia, call the Movement Disorders Clinic: (608) 262-0550.
- If you have questions during holidays and weekends, call the hospital paging operator: (608) 262-0486 or (800) 323-8942. Leave your name, phone number with area code and a physician will call you back.
- For signs of infection or increased pain, ask for the neurosurgeon on call.
- For problems with confusion, dyskinesia or other questions about medications, ask for the neurologist on call.