

Deep Brain Stimulation



UHN

Information for Patients

Krembil Neuroscience Centre

What is deep brain stimulation?

Deep brain stimulation (DBS) is a treatment for conditions such as Parkinson's disease. With DBS, electrical impulses are sent to target areas deep within your brain. This electrical stimulation can help relieve symptoms, without harming your brain.

To have this treatment, you will need surgery to put the DBS system (an implanted neurostimulator) inside your body.

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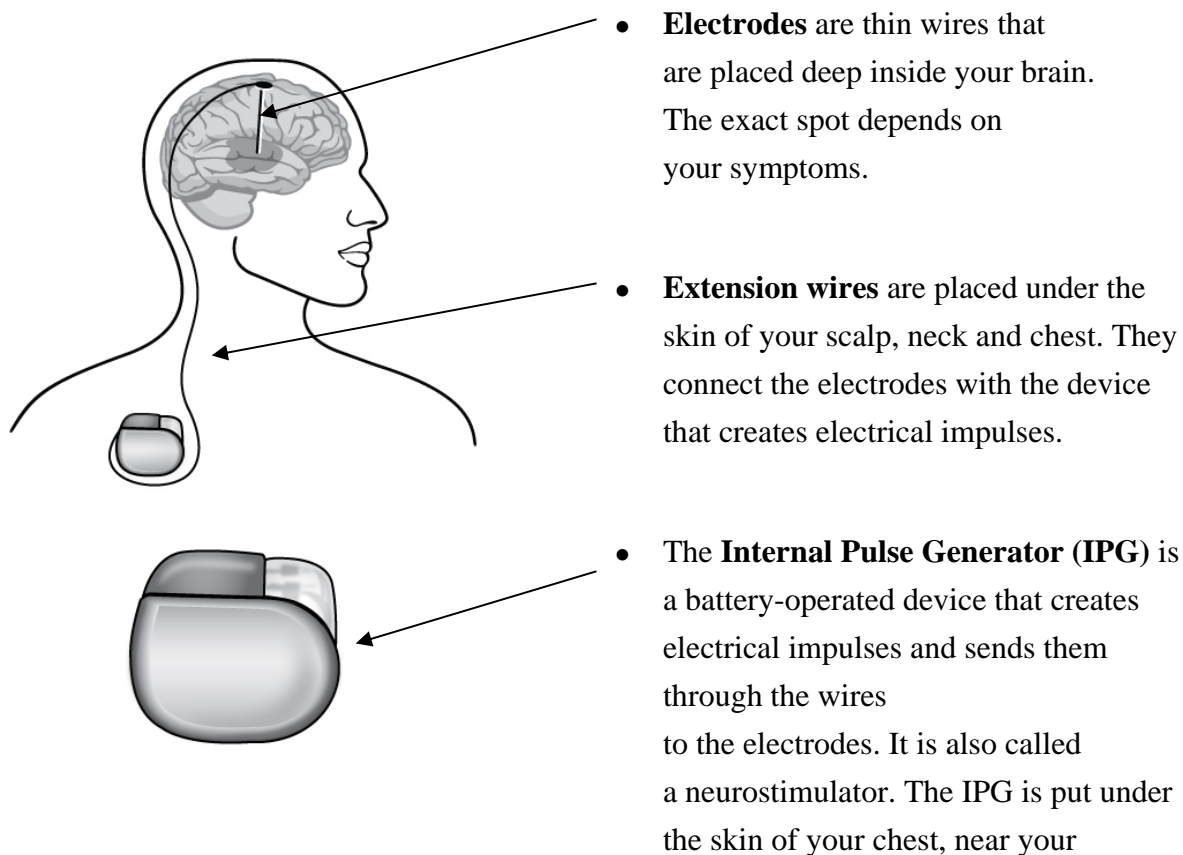
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The DBS system has 3 parts:



The surgery is done in 2 stages: These stages may be done on the same day or on different days.

- **Stage 1:** Placing the electrodes in the target areas of your brain.
- **Stage 2:** Placing the extension wires and IPG. Connecting the parts of the DBS system, without turning it on.

Reading the rest of this booklet will help you know what to expect before, during and after surgery.

What happens before surgery?

You will meet with certain members of the health care team and may have tests to see if DBS is a good, safe treatment for you. These appointments and tests vary depending on the reason for your DBS surgery.

Clinic Appointment with the Neurosurgeon

- The neurosurgeon will examine you and see if DBS is a good option for you and see if you are well enough for brain surgery. He or she will explain the procedure, its risks and benefits, and answer your questions.
- You should bring a family member or support person to this appointment.

You may also have the following appointments or tests:

- Clinic appointment with the neurologist
- Psychiatric evaluation
- Psychological assessment
- PET Scan (Positron Emission Tomography)

These will help decide if DBS is a good and safe treatment for you.

Pre-admission Assessment

- The Neurosurgeon's office will arrange your pre-admission appointment in the days or weeks before surgery. This visit will take 3 to 4 hours.
- During this visit:
 - the doctor and nurse will ask about your health and medical history
 - you will have a physical exam
 - you may have blood tests, an electrocardiogram (ECG) and a chest x-ray
- Please bring:
 - your Ontario Health Card
 - your blue hospital card
 - a list of the names and dosages of your medications

What happens on the day of surgery?

Admission to the Hospital

- Come to the Pre Operative Care Unit (POCU) at 6 am on the day of your surgery.
- The nurses will admit you and help you get ready for surgery. They will check your vital signs: blood pressure, pulse, temperature and breathing. You will change into a hospital gown.

Applying the Head Frame

- A special frame will be put on your head in the MRI department. The frame will keep your head still and secure during surgery.
- A local anaesthetic will numb the areas where the pins will be put in to hold the frame in place (2 at the front, 2 at the back).



Wearing the frame and box helps get clear images of your brain. These pictures will help the doctor place the DBS electrodes.

Having a Brain MRI (Magnetic Resonance Imaging)

- A brain MRI creates detailed images of your brain that will be used to position the DBS electrodes.
- For the MRI, a box and coil are attached to the frame. This may feel heavy.
- The MRI will take about 45 minutes. Please try to stay as still as possible. This helps the technician get the clearest pictures of your brain.
- After the MRI, the box and coil are removed. Only the frame will remain on for the surgery.
- You will then go on to the holding area.

If you have claustrophobia (a fear of closed spaces) or cannot hold still because of your condition, tell your neurosurgeon before the date of your surgery.

What happens during surgery?

In the holding area, an operating room nurse will check that everything is ready for your surgery. You may also see the anaesthesiologist, the doctor who may give the anaesthetic and monitor you during surgery.

When everything is ready, you will be taken into the operating room. The surgical team will help you move onto the operating table and get comfortable. You will be in a semi-sitting position with your head frame fixed to the operating table.

Stage 1: Placing the Electrodes

You will be awake for this part of the surgery. It will take about 3 hours.

In stage 1, the surgeon will:

- shave and wash your head with an antiseptic solution
- numb parts of your scalp so you won't feel pain
- make an incision on the top of your head and two "burr" holes (about the size of a nickel), one on each side

- insert each electrode so the tip is in the target area of the brain
- stimulate the electrodes and measure how your brain cells react
- ask you about the effects of stimulation to make sure the proper areas of your brain are stimulated
- secure the electrodes in place and close the incisions and holes
- remove the frame from your head

If you do not go on to stage 2 on the same day, you will go directly to the post-anaesthetic care unit. You will then go to the neurosurgery unit with the electrodes left outside of your head covered by a bandage. The electrodes may be tested to see if they are effective for your condition. If the DBS is beneficial for you, you will go on to stage 2. If not, a surgery will be scheduled to remove the electrodes instead. You may also be asked to participate in a research study.

Stage 2: Placing the Extension Wires and IPG

You will be asleep during this part of the surgery. It will take about 45 minutes.

In stage 2, the surgeon will:

- connect the extension wires to the electrodes
- place the wires under the skin, from the scalp at the top of your head, behind your ear, down your neck to your chest
- connect the extension wire to the IPG unit
- place the IPG under the skin below your collarbone (with the IPG turned off)

What happens after surgery?

Post Anaesthetic Care Unit (PACU)

- When the surgery is finished, you will go to the PACU for 1 to 3 hours.
- The nurses will check your vital signs often, as you wake up. If you have pain or nausea, they will give you medications that will help.
- You may have oxygen on over your mouth and/or nose.

- There will be a bandage covering the incision on your head and chest.
- After this recovery time, you will go to your room on the Neurosurgery unit (5A or 5B).

On the Neurosurgery Unit

- The health care team will continue checking your condition and progress.
- You may have a headache, pain in your incisions and nausea. This will gradually get better.
- The nurses will give you medications, including those for pain and nausea as needed.
- In the afternoon or evening you can start to drink and eat.
- Later in the day or the following day, the nurses will help you get out of bed and walk. You may feel dizzy, so it is important that someone is with you the first few times that you get out of bed.

MRI

- You will have another MRI to check the position of the electrodes.

Getting Ready To Go Home

- You can expect to go home 2 or 3 days after surgery if the stages are done on the same day. Otherwise, you will most likely be discharged the day after the insertion of the IPG. Please arrange for someone to take you home before 11 am on the day you are discharged.
- Before you leave the hospital, a member of the health care team will review:
 - your medications
 - how to care for yourself, what to watch for and how to get help if needed
 - your follow-up appointments, including when your DBS system will be turned on

What happens after I leave the hospital?

Activating your DBS

- If your DBS has not been activated before you leave the hospital you will be given instructions about when this will occur.
- Depending on the reason why you had the DBS inserted, you will also have regular follow-ups as needed to evaluate how the DBS is working.

Clinic Appointment with the Neurosurgeon

- You will see the neurosurgeon 6 to 8 weeks after your surgery. The doctor will check your condition and the incisions.

Tests and Scans

- You may have other appointments for psychiatric evaluation, neuropsychological testing and PET Scans.
- By comparing these results with those from before surgery, the neurosurgeon can see the effects of the DBS treatment.

Visiting your Family Doctor

- Make an appointment with your family doctor to have your staples removed 10 to 14 days after surgery.

DBS Registration Card

- You will get a registration card for your DBS system. You may get it before you leave the hospital or in the mail, from the company that makes your DBS system. Carry this card with you at all times.

Medic Alert

- You may want to get a Medic Alert bracelet. In an emergency, the bracelet tells medical staff that you have a DBS system.

How long does the IPG battery last?

The battery lasts about 3 to 4 years. You may notice a return of your previous symptoms at that time. When the battery wears out, you will need surgery to replace the IPG. This is done as a day surgery procedure and you will be able to go home the same day.

What precautions should I take after surgery?

You must take extra precautions for your safety when you have a DBS system in place.

**Follow these precautions or
you may be severely hurt or die.**

Do not have a body MRI.

- You can have a brain MRI with precautions.

Do not have diathermy treatments (heat therapy).

- Diathermy treatments deliver energy to heat and heal tissues in the body.

Tell all your health care providers that you have a DBS system and always carry your DBS registration card.

Where can I get more information?

If you have any questions, don't hesitate to ask a member of the team during your appointments or give us a call.

Dr. Lozano: 416-603-6200

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