

# IMPLANTATION OF A DEEP BRAIN NEUROSTIMULATOR

## BEFORE THE SURGERY

### A FEW DAYS BEFORE OR ON THE EVE OF THE SURGERY

You will take a magnetic resonance imaging (MRI) test so that the medical team can view the targets, point of entry, anatomical structures, and electrode path.

### ON THE DAY OF YOUR SURGERY

The neurosurgeon will affix metallic frame to your head. That stereotactic frame will be used to perform a magnetic resonance scan or head scan.

This exam will help us to effectively locate all the brain structures and to determine whether there are any blood vessels along the path. Identifying them helps to lower the risk of bleeding.

## DURING THE SURGERY

- Your hair will be shaved at the incision site.
- You will remain awake during the first phase of the surgery (electrode implant).
- Tell us at any time if you feel discomfort during the procedure.

### PROCEDURE

- One or two incisions will be made on the top of your head.
- A *burr hole* is then drilled through your skull.
- In some cases, a microelectrode can be inserted through this hole as far as the identified nucleus, depending on the set target and path.
  - The microelectrode records the nucleus's cellular activity and confirms proper positioning.
  - Because you will be awake, you may perceive this activity (brain/nervous system response to the electrode), and the neurosurgeon and other workers present will proceed with an evaluation. Your collaboration might be required.
- Once this evaluation period is completed, the permanent electrodes are installed and affixed to the bone. X-ray images will confirm the position of the electrodes. The fixatives leave small lumps that you may feel beneath the skin on the top of your head. That is normal.
- Various tests will be performed to evaluate the reaction of specific cells to your health problem. These tests may include evaluations of trembling; sensory reactions to touch or to the movement of the hands, legs; facial contractions; speech and pronunciation; etc.
  - At this stage, **your collaboration might be necessary**. The medical team will ask you questions to find out whether you feel swelling, tingling, muscle spasms, or other sensations.

- Depending on your case, the intervention may be bilateral (both sides of the brain). If that is so, the same steps will be repeated for the other side.

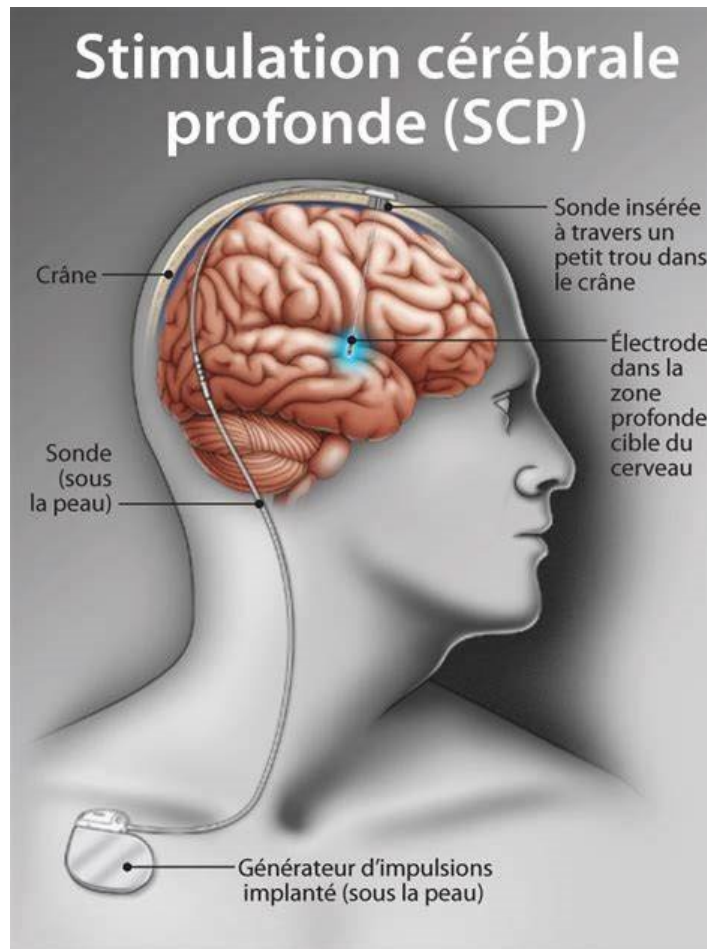


Image courtesy of: CHU de Québec

Some patients require a trial period before they can consider having a permanent neurostimulator implant. If that is your case, the surgery will end here, and the medical team will send you to the recovery room. For the **trial phase**, the neurosurgeon will adjust the neurostimulator settings in the upcoming days. Then he will assess the next stage with you and decide whether there will be a permanent implant or not.

If the **permanent neurostimulator** implant is scheduled on the same day as the electrode implant (trial phase not required), the surgery will take place under general anesthesia, a state comparable to sleeping.

- The electrodes will be connected to the neurostimulator (impulse generator) with an extension.
- A tiny incision will be made behind your ear to slide the probe in.
- Another incision will be made at the subclavian level (near the pectoral muscle) to slide the neurostimulator in. The probe and neurostimulator will both be in subcutaneous tissue beneath your skin.

## **AFTER THE SURGERY**

**The day after the surgery**, you will have a magnetic resonance imaging exam to confirm the final position of the electrodes. You will be given a medical prescription to have your sutures removed: schedule an appointment at your local CLSC.

### INITIAL SETTINGS AFTER THE PERMANENT IMPLANT

- About one month after your surgery, the first neurostimulator settings will be set by the neurosurgery or neurology team.
- You must be accompanied to that appointment.
- Bring the remote control that was given to you after your surgery.
- Once the settings are completed, your medication might be adjusted in accordance with the stimulation that has been initiated.
  - Please note that it can take approximately 6 months for the settings to be optimal, and adjustments may be required.

### UNDESIRABLE EFFECTS OF STIMULATION

Stimulation can cause undesirable effects, including tingling, changes in pronunciation (slower and less precise), vision problems, dizziness, weakness, episodic changes in mood or behaviour, significant dyskinesia, dystonia, and balance issues.

However, these effects can be reversed by modifying the stimulation parameters (reprogramming) or by changing the medication.

- It is therefore important that you notify the nurse at the clinic if you present with any undesirable or other effects.

### ADVICE AND RECOMMENDATIONS

- Speak to your physician before undertaking any activities, tests, exams or treatments that involve magnetic or electrical fields (e.g., magnetic resonance, welding).
- When consulting a physician, dentist or any other medical expert, notify them that you have a neurostimulator before agreeing to any treatment. Show them the implant card given to you at the time of your surgery.

## **BACK HOME**

### Consult a physician if you have the following symptoms:

- Chills or fever (>38,5°C or 101.3°F).
- Discharge, puss, redness or swelling near or of the wounds.
- Increase of pain at wound level.
- Opening of the wound despite sutures.

### During the first month after your surgery, avoid:

- Moving your neck suddenly and repeatedly;
- Lifting objects weighing more than 2.5 kilograms (5 pounds);
- Doing extremely demanding activities or sports;
- Driving a vehicle;
- Swimming in a pool or a spa.

### CLINICAL MONITORING BY THE NEUROSURGERY TEAM AND/OR NEUROLOGY TEAM

- Having a neurostimulator requires various types of medical monitoring.
- You need to be rigorously committed as regular follow-ups with the team are necessary to ensure the efficacy of your neurostimulator. Bring your remote control to your follow-up appointments.
- Appointments will be more frequent during the first year and will subsequently span another 6 to 12 months - until stability is achieved.
- The neurologist will regularly meet with you to adjust your medication or brain stimulation to optimize your response to the treatment.
- The neurosurgeon will regularly ensure that the neurostimulator and device are functioning properly, that the treatment is effective; and that the wounds are healing.

For any **emergency**, go to the emergency department at Hôpital Fleurimont. If your health status does not permit you to go there, then go to your nearest hospital emergency department.

## **DO YOU HAVE ANY QUESTIONS?**

### Neurosurgery Department

819-843-1110, Ext. 75034, press option 0

### Neurology Department

819-346-1110, Ext. 14586

### CLSC or Info-Santé 811

Your local CLSC during business hours

Info-Santé 8-1-1: evenings, nights and week-ends

### Appointments

Appointment centre: 1-819-564-5210

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