



Intracranial Electrode Implantation

EEG scalp recording cannot always identify the exact location of where a seizure starts. Some people will need further testing, which can be done using intracranial electrodes such as subdural, grid, or depth electrodes. Surgery is needed to put these special electrodes in place. Your neurologist and neurosurgeon will discuss all options and information about the surgery with you prior to the operation.

What are intracranial electrodes?

Intracranial electrodes are EEG electrodes that are placed inside the skull in order to monitor seizure electrical activity in the brain as precisely as possible.

Subdural electrodes or grids are plastic strips or sheets with electrodes embedded on them. They are placed directly on the brain.

Depth electrodes are thin, wire-like tubes with metal contacts. These are inserted into the brain.

This pamphlet will help you understand what you can expect throughout the process.

The Surgery

Electrode electrodes are inserted while you are under a general anesthetic, meaning you are asleep during the surgery. During the procedure, your hair may be shaved off and your scalp will be cleansed with a special orange solution called betadine. The neurosurgeon will insert the electrodes using different surgical techniques.

Subdural electrodes are inserted through small nickel-sized holes that are drilled through the skull. The location and number of the holes will depend on the type of seizures and what questions need to be answered.

Generally 2-4 holes are required and several electrodes may be placed through each one. Depth electrodes are individually inserted through tiny holes in the skull. Grids are inserted by removing a section of bone from the skull (an opening called a craniotomy), placing the grid on the brain, and then replacing the bone.

After the surgery, you will go to the post anesthetic care unit (PACU) for monitoring until you wake up. Before

going to the epilepsy unit, you will go for a CT scan and/or MRI to ensure the electrodes are in place.

The electrode wires are stitched to the scalp and incisions in the scalp are closed with staples.

A large, bulky dressing is applied over the wires. You might have drainage onto this dressing for the first few days after surgery. If there is a large amount, nurses will reinforce the dressing and keep the head of your bed at a 30 degree angle.

The dressing will be changed at the surgeon's discretion. At that time, the surgeon may examine the incisions for redness, infection, or leakage of cerebrospinal fluid (CSF). Nurses will assist the neurosurgeon in this process, which is done on the epilepsy unit with curtains drawn for privacy.

Post-Operative Care

After surgery, our goal will be to make you as comfortable as possible. You will be offered medication for pain and nausea. In addition to being monitored for seizure activity, your neurological condition will be checked very carefully by the EMU nurses.

You will have an intravenous (IV) infusing after the surgery to help keep you hydrated. The IV will be discontinued once you are eating and drinking well.

It is highly encouraged that you begin to resume your normal activity levels after surgery to promote your health and healing. You are still permitted to leave the floor 3 times a day, for a maximum of 15 minutes each time. Please ask a nurse to disconnect you when you wish to leave the unit.

Removing the Electrodes

Once the neurological team is satisfied with the EEG recordings from your seizures, the neurosurgeon will remove the electrodes. Removing subdural or depth electrodes is a simple procedure done in the treatment room while you are awake, and grid removal is done under general anesthetic in the operating room.

You will be discharged the next day. Nurses will explain and provide instructions for your discharge. A follow-up appointment with your family doctor is needed to remove any sutures. You will also receive a follow-up appointment with your neurologist/neurosurgeon.

It will take about 6 months to 1 year for the bones to heal from the holes or craniotomy. Scalp incisions will heal in 10 days.

If you have any questions or concerns you can speak to a nurse, neurologist, neurosurgeon, or other member of the health care team at any time.

The EMU telephone number is 519 685-8500 x 33317.

