Intracranial Electrode Recording
Why do I need Intracranial Electrodes?
Sometimes the cause and exact location of epileptic seizures is difficult to find. When routine EEG’s using electrodes on the scalp surface cannot locate where a patient’s seizures are originating, neurosurgeons may need to do intracranial monitoring.

What is Intracranial Monitoring?
The neurosurgeons place electrodes, referred to as intracranial strip or grid electrodes directly on the brain surface or depth electrodes within the tissue of the brain. These techniques allow for precise mapping of areas causing the onset of seizures as well as critical areas of the brain that control speech and motor movement, which will need to be avoided during surgery. By identifying areas of the brain to be removed and those that need to be preserved, neurosurgeons are able to improve seizure outcomes and reduce serious permanent neurological injuries after surgery.
Where do the Electrodes Go?

Invasive recordings can be performed using:

Subdural electrodes—positioned over the surface of the brain between the lining (dura mater) and surface of the brain. The electrodes come in various forms; strips or grids. Your neurologist and neurosurgeon will decide the type and placement of the electrodes.

Depth Electrodes—thin wires are placed deep in the brain to detect seizure activity that cannot be detected by electrodes placed on the surface of the head or by subdural strips or grids.

How is the Procedure Done?

Depth electrodes are placed inside the skull through a tiny opening. This can be done with the patient awake using a special head frame.

Strip electrodes are placed through a small burr hole created in the skull. This procedure is done under general anesthesia in the operating room.

Grid electrode placement is done under general anesthesia in the operating room. While asleep, your hair will be shaved to reduce the chance of infection. A larger opening, (craniotomy) is necessary to position the grid.

Where will I go after the Procedure?

After the procedure you will be taken to the Recovery Room. You will be able to move your head but the gauze dressing will feel heavy. The nurses do frequent neurological checks to ensure your condition is stable. Once you are awake and stable you will go the Seizure Investigation Unit where you stayed during scalp electrode monitoring. You will be monitored by video/EEG continuously 24 hours/day and your neuro-vital signs will be checked regularly.

How long does Invasive Monitoring last?

The monitoring period is usually one to two weeks but may go longer if necessary.

Things I need to know while being Monitored:

You will require supervision when getting out of bed. You will have a nurse call bell for assistance. You will be instructed to press the ‘seizure button’ if you feel a seizure coming on. The padded side rails must be up at all times for your safety and protection. Anti-epileptic medications may be gradually withdrawn and you may be sleep deprived so that your seizures can be recorded. A cot is available for a responsible adult to stay with you.
How are the Electrodes removed?
After monitoring is completed, your electrodes will often be removed during a second procedure in the operating room. Some electrodes (depth and strips) can be removed at the bedside.

When does my Surgery happen?
If you are determined to be a surgical candidate, a selective removal of brain tissue responsible for your seizures will be performed in the Operating Room usually at the time of electrode removal. You will go to the Recovery Room, then the Neuro Intensive Care Unit and eventually to a bed on the Neurology ward.

Following surgery you will stay in the hospital for 4–7 days. By then you will be up and about, on your full dose of medication and ready to go home.

How will I Feel Afterwards?
You may feel uncomfortable for the first few days. Headaches, nausea and vomiting are not unusual. Some swelling of your eyes and face may occur. Pain medication and medication to settle your stomach will be available if required.

Are there any Dangers?
There is a small risk of infection and bleeding. The risk of new neurologic problems is very low.