EPILEPSY SURGERY

F.E. Dreifuss Comprehensive Epilepsy Center

WHAT IS EPILEPSY SURGERY

Epilepsy surgery is a brain surgery to stop or reduce the number of seizures you're having. Epilepsy surgery is most effective when seizures always occur in a single location in the brain. It is not the first line of treatment but it could be an option when at least two anti-seizure medicines have failed to control your seizures.
You will need several tests before surgery to find out if epilepsy surgery is an option and what type of surgery could be performed.

WHAT ARE SOME TEST I WILL NEED BEFORE BEING CONSIDERED FOR SURGERY?

- **EEG:** An EEG records the electrical activity of your brain which helps us to determine where the seizures are coming from.
- **MRI (Magnetic Resonance Imaging)**: An MRI provides a visual image of your brain. You will lay flat on at narrow table inside the opening of a large magnet. You will hear loud humming and whirring sounds, but this is a painless procedure.
- **PET (Positon Emission Tomography):** A PET measures how your brain metabolizes sugar when it is not actively seizing. This requires a radioactive tracer to be injected and a CT scan is done afterwards.
- **SPECT:** A SPECT measures blood flow to the brain when a person is having a seizure. This requires a radioactive tracer to be injected by a nurse during a hospital admission.
- **WADA:** With this test, an injected medicine temporarily puts one side of the brain to sleep at a time. While this section of the brain is asleep, a test for language and memory is done. This test can help us determine which side of the brain controls language and speech. A functional MRI is often used instead of this test.
- **NEUROPSYCHOLOGICAL TESTING:** This is a test that looks at different areas of the brain including memory, IQ, motor function and speech. Everyone has areas of the brain that are stronger or weaker than others, but in people with epilepsy the weaker area often corresponds with the seizure location.

WHAT TYPES OF EPILEPSY SURGERIES ARE AVAILABLE?

Epileptic seizures result from irregular electrical activity of brain. The type of surgery needed depends on the location of the seizure and the age of the person having the surgery. Types of surgery include:

- **Resective surgery** is the most common epilepsy surgery. It involves the removal of a small portion of the brain. The surgeon cuts out brain tissue from the area of the brain where seizures occur. This is usually the site of a tumor, brain injury or malformation. Resective surgery is usually performed on one of the temporal lobes. This is an area of the brain that controls visual memory, language comprehension and emotions.
- **Laser interstitial thermal therapy (LITT)** is less invasive than a resective surgery. It uses a laser to pinpoint and burn away a small portion of brain tissue.
- Deep brain stimulation is the use of a device that is placed permanently deep inside the brain. The device releases regularly timed electrical signals that interrupt seizure activity.
- **Corpus callosotomy** is surgery to completely or partially remove the part of the brain that connects nerves on the right and left sides of the brain. This part of the brain is called the corpus callosum. This surgery is usually used with children who experience irregular brain activity that spreads from one side of the brain to the other.
- **Hemispherectomy** is a procedure to remove one side of the brain called the cerebral cortex. This surgery is generally done only in children who experience seizures that come from multiple sites in one hemisphere, usually the result of a condition present at birth or in early infancy.
- **Functional hemispherectomy** is a procedure normally used in children that removes the connecting nerves without removing actual pieces of the brain.

WHAT ARE THE RESULTS OF EPILEPSY SURGERY?

With any surgery, there are risk that your physician will discuss with you. Normally, less than 1% of patients have a serious unexpected complication (like stroke or death). About 15% of patients have a temporary or mild complication (headache, mild memory difficulty, vision changes). The goal of epilepsy surgery is to decrease the number of seizures, the severity of the seizures or to become seizure-free. You may or may not be able to achieve this goal. Results are different for everyone.

Even if you cannot be seizure free after surgery, you still may benefit from:

- A lower dose of your anti-seizure medication or the number of medications you need to take, which can also reduce medication side effects.
- A greater chance of returning to work and driving.
- A reduced risk of life-threatening complications, such as sudden unexplained death in epilepsy or status epilepticus.
- A lower risk of depression and anxiety if surgery is successful.

QUESTIONS TO CONSIDER

- What are your goals for surgery?
- What is your risk for injury with seizures?
- How do you seizures impact your quality of life?
- How do you seizure medications impact your quality of life?

SUDDEN UNEXPECTED DEATH IN EPILEPSY (SUDEP)

It is rare for people to die from a seizure, but it can happen. The most common cause of death in people with epilepsy is SUDEP, or sudden unexpected death in epilepsy. Since uncontrolled seizures may play a role, it's important to pay attention to your seizure frequency and seizure control.

Do not suddenly stop your medication.

Limit alcohol consumption.

If you have nocturnal seizures, talk to your health care providers about a safety plan which may include: sharing a room with someone at night, seizure alert monitors, avoiding seizure triggers, avoiding alcohol, and maintain a healthy lifestyle.