What Is Epilepsy Surgery?

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Epilepsy surgery is a brain operation to control epileptic seizures. There are different types of operations for different types of epilepsy.

In epilepsy surgery, the surgeon removes the abnormal portion of brain that is causing the seizures. Brain tumors, vascular (blood vessel) abnormalities, old strokes, and congenital (inherited) irregularities might also be treated if they are believed to be causing the seizures.

Who Is A Candidate For Epilepsy Surgery?

In general, epilepsy surgery may be considered in people of any age. The best candidates for epilepsy surgery are:

- People with epileptic seizures that cannot be controlled satisfactorily with medication, and whose lives would be improved if seizures were controlled. (The definition of “satisfactory” control is different for every person.)
- People with a brain abnormality that can be identified as the cause of seizures. Some abnormalities such as brain tumors may need surgery even if seizures are well controlled with medication.

What Is The Evaluation Process For Epilepsy Surgery?

A number of steps are necessary to identify the location and cause of the seizures, and to determine the best treatment:

1. A neurologist will perform a medical history and neurological examination.

2. Electroencephalogram (EEG) is a "brain wave" test that detects abnormal areas that may cause seizures.

3. Magnetic resonance imaging (MRI) gives a detailed picture of the inside of the brain. MRI may help identify the cause and location of the seizures.

4. Adjustments or changes in medication may be made before surgery is considered. Sometimes, just adjusting medications can control seizures. Usually, at least three medicines are tried before considering epilepsy surgery. Blood tests are necessary to adjust medication levels for best effect.

5. Video-EEG monitoring is done while the patient stays in the hospital for five to seven days. EEG is performed continuously, and medications may be reduced so that seizures can be recorded. The monitoring is recorded and the seizures are analyzed to gain information about where they start.

6. Other tests give information about how well different parts of the brain are working. These tests may include:

- positron emission tomography (PET) scan,
- magnetoencephalogram (MEG)
- ictal SPECT
- functional MRI (fMRI),
- neuropsychological testing (memory, language, and thinking),

7. In some cases, EEG electrodes must be put directly into or on the surface of the brain through surgery to find the source of the seizures and to map out important brain functions that should be spared.

Which Types Of Surgeries And Procedures Are Considered?

Focal resective surgery is performed in children with partial epilepsy, whose seizures arise from a small part of the brain. It might be caused by an injury, head trauma, brain tumor, or infection, among other things. During this type of surgery, a small part of the the temporal lobe, or under the temple, is removed in order to preserve important neurological functions. These functions include movement, sensation, speech, and memory.

Hemispherectomy is performed on people with abnormalities on one hemisphere of the brain. Children with Sturge-Weber disease, Rasmussen's encephalitis, hemimegalencephaly, or perinatal stroke may injure a large area on one side of their brain. Children tend to have neurologic problems, like paralysis and loss of feeling on one side of the body. With this surgery, a portion of the damaged brain is removed, and the rest of the hemisphere is disconnected from the "good" portions of the brain. This can keep the seizures from spreading.

Callosotomy involves cutting part of the corpus callosum. This is a large bundle of nerve fibers that connect both sides of the brain. In doing so, it stops the seizures from spreading from one side of the brain to the other. Children with severe stiffening or limp seizures that cause falling tend to benefit from this the most.

Subdural electrode insertion involves placing electrodes directly in contact with the brain. In doing so, a surgeon can pinpoint the region of the brain that is causing seizures. It can also be used to stimulate underlying brain tissue.

Stereoelectroencephalography (SEEG) is a "less invasive" method for mapping seizures. Thin probes are placed into deep regions in the brain. This technique allows safe, accurate, three-dimensional mapping of seizure activity in brain regions that can otherwise not be seen. It is especially useful for children who receive "normal" MRI results.

Vagal nerve stimulation involves placing an electrode on the left vagus nerve and a generator under the skin over the left chest. The device is then programmed to deliver periodic electrical impulses to the vagus nerve. They are then sent via the brainstem to the cerebral cortex. Forty to fifty percent of patients see a reduction in seizures. It is an option for children who cannot have resective surgery.

Integrated Care

If your child experiences seizures or has epilepsy, we offer complete diagnostic services and a team of experts to provide comprehensive care, beginning with a first seizure evaluation by experts in nursing and neurology (pediatric neurologists, epileptologists, and neurology nurse practitioners).

As your child grows into their teen years and adulthood, we'll continue to work closely with your family to provide the most effective management and best care for epilepsy and seizures. Over the course of treatment, your child might receive care from providers in the following specialties and services:

- **Neurosurgery**
- **Neurology**
- Pediatric Rehabilitation Medicine
- **Neuropsychology**
- **Child life**
- Psychiatry
- **Psychology**
- **Rehabilitation therapies**
- **Radiology and imaging**
- **Social work**

You can trust your child's care to our expertise in treatment of epilepsy and seizures. As a regional leader in pediatric neurology and neurosurgery, we understand that many kids who have epilepsy also have complex associated conditions, such as cerebral palsy, developmental delays or traumatic brain injuries. That's why we offer a large team of specialists and extensive support services.

Appointment: 651-290-8707 **Refer a Patient: 651-325-2200** **Pediatric Expert Consult** **More Ways to Contact Us**