

# WHO SHOULD BE EVALUATED FOR EPILEPSY SURGERY?

Home > Health Hub > Health Library > Who Should Be Evaluated ...

What is epilepsy surgery?

Who is a candidate for epilepsy surgery?

What are the different types of epilepsy surgery?



Download as PDF



Share this Article

## Who Should Be Evaluated For Epilepsy Surgery?

### What is epilepsy surgery?

Epilepsy surgery involves a brain operation for the safe removal or disconnection of abnormal brain tissue causing epileptic seizures. Surgical approach is unique for each patient and is tailored based on careful presurgical evaluation.

### Who is a candidate for epilepsy surgery?

In general, epilepsy surgery may be considered in people of any age, from infancy to adulthood. The best candidates for epilepsy surgery have all of the following characteristics:

- They have epileptic seizures arising from a well-defined focal area within the brain.
- They have failed two or more adequately tried anti-epileptic medications and
- In whom a complete and safe removal of the seizure-causing focal area is possible.

### What are the different types of epilepsy surgery?

- **Focal resective surgery** is performed in people with partial epilepsy, in which seizures arise from a “focus” within the brain. It may involve removing a small part of the brain, with the intent of sparing important neurological functions such as movement, sensation, speech, and memory. The most common location of surgery is in the temporal lobe (under the temple). Partial epilepsy may be caused by a scar from birth, injury or head trauma, brain tumors, arteriovenous vascular malformations (a tangle of blood vessels resulting in fewer than normal connections between capillaries), infections, or abnormal brain development. When epilepsy causing area is large, removal of one or more lobes of the brain may be necessary and this recommendation is reached based on careful evaluation of risks and benefits for such a procedure.

- **Hemispherectomy** is performed in people with abnormalities of one hemisphere (side) of the brain. Conditions such as Sturge-Weber disease, Rasmussen's encephalitis, hemimegalencephaly, or perinatal stroke may injure a large area on just one side of the brain. People with these disorders typically have severe neurologic problems, such as paralysis and loss of sensation on one side of the body. Hemispherectomy involves a complete removal or partial removal with disconnection of epilepsy causing hemisphere from the healthy side. Such a disconnection prevents seizures from spreading to the healthy side from any remaining epileptic tissue.
- **Callosotomy** involves cutting part of the corpus callosum, a large bundle of nerve fibers that connect the two sides of the brain. The goal is to prevent spreading of seizures from one side of the brain to the other. Callosotomy is usually performed in people with severe generalized tonic (stiffening) or atonic (limp) seizures that cause falling and injuries ("drop attacks"). Callosotomy is often used as a palliative procedure to reduce the most disabling seizures as the likelihood of complete seizure freedom is small in such severe forms of epilepsy.
- **Vagal nerve stimulation** does not involve surgery on the brain. It 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 intermittent electrical impulses to the vagus nerve which are then transmitted via the brainstem to the cerebral cortex. While the exact mechanism of action is unknown, the device may result in modest reduction of seizures in approximately 40% to 50% of patients. It may be considered as an option in those patients where resective surgery is not indicated. Of note, the implantation of VNS device may cause limitation in performing MRI tests in the future for such patients – an important fact to consider before proceeding with the implantation.

## 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.

- A neurologist with special training in epilepsy will perform a medical history, neurological examination and coordinate various tests noted below.
- Electroencephalogram (EEG) is a "brainwave" test that detects abnormal electrical signals that may cause seizures. EEG is performed in an outpatient EEG laboratory.
- Magnetic resonance imaging (MRI) performed with special attention for epilepsy focus ("Epilepsy Protocol") is essential and the images are interpreted by experienced radiologists for the most accurate evaluation of epileptic focus.
- Video-EEG monitoring is conducted during a five to seven-day inpatient stay. EEG is performed continuously, and medications are reduced so that seizures can be recorded. Analysis of seizures on videotape gives further clues about the source of the seizures.
- In some cases, EEG electrodes must be put directly into or on the surface of the brain surgically to find the source of the seizures and to map out important brain functions that should be spared.
  1. **Subdural electrode insertion** involves placing electrode arrays directly in contact with the brain in order to better localize the region(s) of the brain responsible for seizure onset. They also can be used to stimulate the underlying brain tissue and document the presence of cortex that supports important motor or language function. This technique is especially useful in patients who have medically intractable epilepsy and require functional brain mapping in addition to seizure onset information.
  2. **Stereoelectroencephalography** (or simply SEEG) is a "less invasive" method for mapping seizures that involves precisely placing thin recording probes (1.2mm in diameter) into deep regions in the brain, previously determined by non-invasive workup information. Typically, the patient has several studies prior to placement of the probes including magnetic resonance imaging, PET scans and MEG. This technique allows safe, precise and three-dimensional mapping of seizure activity in brain regions not accessible with other mapping techniques. It is particularly useful for patients who need recordings from deep areas in the brain and in patients with "normal" MRI.

## How well does epilepsy surgery work?

The results of surgery vary, depending on the cause and location of the seizures. Some types of epilepsy may have a 60% to 90% chance of becoming seizure-free after surgery. In other cases, the goal of surgery is to reduce the number of seizures or to reduce injuries caused by seizures. The epilepsy surgery evaluation is necessary to carefully determine the potential benefits and risks in each case.

© Copyright 1995-2018 The Cleveland Clinic Foundation. All rights reserved.

This information is provided by the Cleveland Clinic and is not intended to replace the medical advice of your doctor or healthcare provider. Please consult your healthcare provider for advice about a specific medical condition.

Speak with our Contact Center for assistance

 800 8 2223

 Request An Appointment

[MEDICAL PROFESSIONALS](#) | [MEDIA CENTER](#) | [FAQs](#) | [CAREERS](#)



[Site Map](#) | [Legal](#) | [Privacy Policy](#) | [Social Media Terms Of Use](#)

Copyright © Cleveland Clinic Abu Dhabi LLC 2018  
MOH: SU21651

