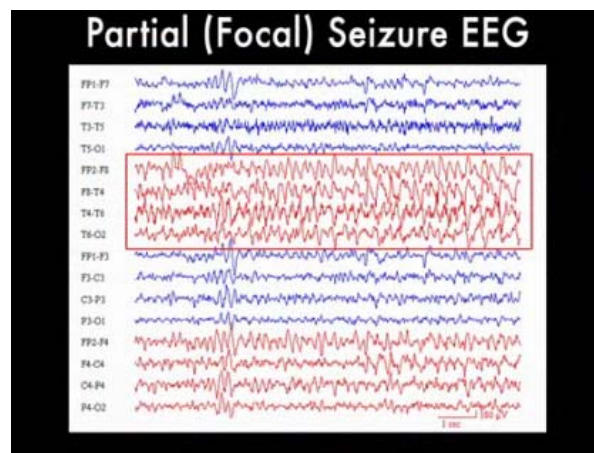


Epilepsy surgery is not for everyone. So how is a patient considered and assessed for a surgical procedure?

Before a person can even be considered for surgery, his or her seizures must persist despite medications and must also interfere with the patient's quality of life. In addition, the surgical candidate must be healthy enough for a brain operation and be willing to accept the risks of surgery. If these criteria are met, a presurgical evaluation is conducted to try and find the area where the seizures start, called the seizure focus. The best candidates are those in whom a single relatively small seizure focus is found in a part of the brain that can be safely removed.



The first part of presurgical assessment is a careful description of seizures by the patient and family. This can give clues about location in the brain where seizures arise. Next, an EEG or electroencephalogram is conducted to measure brain waves, in turn helping to localize abnormal electrical activity in the brain. While EEG's taken in between seizures can help, recordings during a seizure are most informative. This procedure usually is completed in a video-EEG monitoring unit where patients stay for several days or longer to record EEG and video during seizures. If three or more seizures show a consistent place of origin, surgery will most likely be successful.



Neuroimaging with an MRI is another important test for localizing a seizure focus, because it may show a scar or brain injury that is causing the seizures. When both the EEG seizure focus and an MRI abnormality are in the same region, confidence regarding the very best surgical target is increased.

Another vital assessment is neuropsychological testing. Pencil and paper tests are given to measure the person's skill in memory, language and other thinking tasks. In most right-handed people, it's the left side of the brain that controls language and calculations, while the right side controls picture memory and spatial perception. Specific thinking problems shown during neuropsychological testing can help identify abnormal function in different brain areas.



Video EEG's, MRI's, neuropsychological tests are completed in all candidates being seriously considered for epilepsy surgery. Several other tests are done on an individualized basis. One such test, a PET scan, is an imaging test that uses a radioactive tracer to measure consumption of glucose in the brain. This is useful because a seizure focus may consume less glucose between seizures than normal areas of the brain. PET scans are often used when the patient's MRI does not show a clearly abnormal region giving rise to the seizures.

Another test that measures brain activity and may be used is called a magnetoencephalography or MEG test. This can provide a three-dimensional map of where epilepsy waves come from in the brain.

If these tests suggest that surgery can help control seizures, the doctor may recommend additional tests that are more invasive. These additional tests allow direct stimulation of different parts of the brain, which can help pinpoint the seizure focus and localize normal functions further. To learn more about these tests, and how they may be administered, please see the next video in the series.