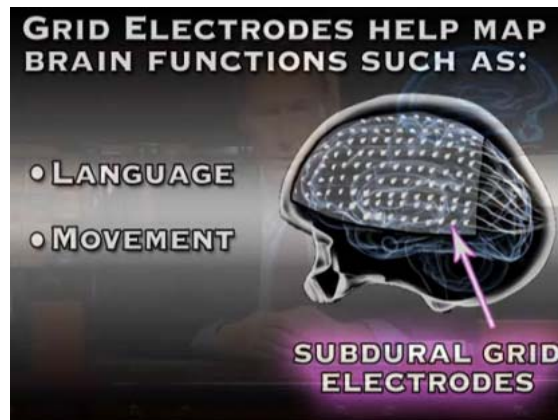


Before a patient undergoes surgery to treat epilepsy, presurgical tests, which may be invasive, are vital to assess where in the brain seizures start.

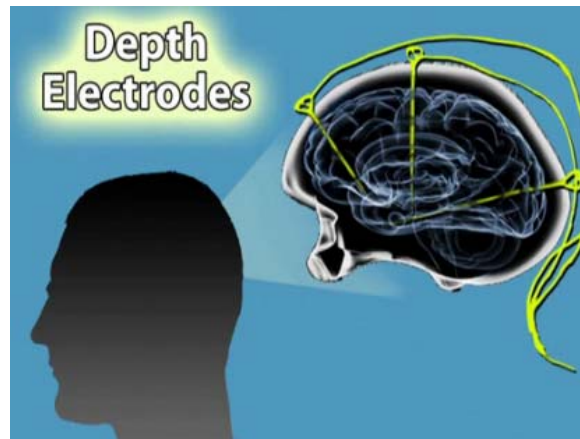
All surgical candidates must undergo several noninvasive tests, described in the prior video, during their presurgical assessment to find the area where the seizures start, called the seizure focus. If these tests suggest that surgery is likely to help control seizures the doctor often recommends additional tests that are more invasive and do come with some risks.

A commonly used invasive test is the intracarotid hemisphere dominance or Wada test. It involves a catheterization, in which a thin plastic tube is put into an artery where the upper thigh and pelvis meet. The tube or catheter is carefully guided to the carotid artery and a quick acting anesthetic is injected. This is performed sequentially on both sides, putting the left and right sides of the brain to sleep, in turn allowing speech and memory to be tested. In most people, language is on the left side of the brain and memory is on both sides. However, if memory is impaired on one side, then it suggests that the temporal lobe on that side is not working well and may be the source of seizures. The Wada test helps a neurosurgeon plan safe boundaries for epilepsy surgery. For example, if memory is impaired in the right half of the brain but excellent on the left side, a right temporal lobectomy can likely be done without risk of harming memory.

Meanwhile, because some seizures originate deep in the brain, their onset is not always seen clearly by scalp EEG recording. In these cases, electrodes are placed under the skull to help the doctor get a close-up look at the seizure focus. Two kinds of electrodes are used: subdural electrode grids or strips, which are put under the skull but on top of the brain; and depth electrodes, which go directly into brain tissue. The grid electrodes placed directly on the surface of the brain can get a close-up recording of seizures. These grid electrodes can help map the function, such as language or movement, of the underlying region of the brain. This is done by sending a small electric current through an electrode, which can inactivate a part of the brain for several seconds. If an activity like counting to ten, for example, is interrupted by this, then the part of the brain that was stimulated can be marked as a control area for speech. Similar analysis can be applied to movement, reading or other brain functions. Grid mapping is useful when seizures are close to a critically important region of the brain.



Subdural or depth electrodes can be used in surgical procedures intended only to diagnose a seizure focus, but they also can be used as part of a two-stage epilepsy surgery. In the latter case, the first stage involves recording the seizures and possibly mapping them and brain functions. The second stage involves removing the electrodes, followed by removal of the brain tissue from where the seizures arise.



If the initial evaluation suggests that you might be a good surgical candidate, then discuss the risks and benefits of the recommended surgical procedure with an epilepsy team.