

THREE MAIN GOALS OF EPILEPSY SURGERY

- 1 Seizure freedom (no seizures) or reduce seizures
- 2 Improve quality of life
- 3 Ability to decrease or stop anti-seizure medication use

Laser Ablation (LITT) Uses light and heat to destroy the seizure-causing brain area guided by MRI for precision, no need to open the skull beyond a small (mm) drilled hole.	Lesionectomy Removes or destroys a small brain abnormality (lesion) that is causing seizures.	Lobectomy Removes one or more lobes of the brain. One of the most common forms of epilepsy surgery.	Hemispheric Surgery Disconnects or removes one half of the brain from the other. Reserved for individuals whose seizures originate from a very large area on one side of the brain.
Corpus Callosotomy HOW IT WORKS Surgeons cut the bundle of fibers connecting the left and right brain — stopping seizures from spreading between the two halves. WHAT TO EXPECT* 50–75% fewer drop seizures¹ Effectiveness across multiple seizure types including atonic and tonic most notably, but also generalized tonic-clonic and absence.	Vagus Nerve Stimulation (VNS) HOW IT WORKS A small device in the chest sends regular electrical pulses up the vagus nerve in the neck to calm seizure activity in the brain. No brain surgery. A magnet swipe may also be used to deliver an on-demand dose of stimulation to abort seizures as a form of rescue. WHAT TO EXPECT* ~50% of people with LGS see 50%+ seizure reduction¹⁻³	Responsive Neurostimulation (RNS) HOW IT WORKS A "brain pacemaker" placed inside the skull detects seizure activity and responds in milliseconds. Can be placed on the surface of the brain or deep inside. WHAT TO EXPECT* ~60% of people with LGS see 50%+ seizure reduction⁵ Still being studied for LGS. Early results are promising.	Deep Brain Stimulation (DBS) HOW IT WORKS Electrodes placed deep in the brain deliver intermittent, scheduled electrical pulses to prevent seizures — like a pacemaker for the brain. WHAT TO EXPECT* 50–70% of people with LGS see 50–60% seizure reduction⁴ A systematic review showing a mean seizure reduction of 63 %, with 81 % of patients achieving significant seizure control, though seizure freedom remains rare.⁶

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70% of patients experience a >50% reduction in overall seizure frequency. GOOD TO KNOW No device. Hospital stay varies and depends on the method of surgery and whether adverse effects occur. Adverse side effects include disconnection syndrome, fatigue, numbness in the scalp and headache. *Seizure reduction was performed against individuals who did not receive treatment. 1. Thirunavu <i>et al</i> (2021), Epilepsia. 2. Lancman <i>et al</i> (2013), Seizure. 3. Samanta <i>et al</i> (2024), Children. 4. Samanta <i>et al</i> (2025), Epilepsy Research. 5. Ahn <i>et al</i> (2024), Epilepsia. 6. Shlobin <i>et al</i> (2023), Neurosurgery. 7. Cukiert <i>et al</i> (2020), Seizure.	Gets more effective over time — improves from ~30% at 6 months. The efficacy of VNS in reducing specific seizure types in patients with LGS varies significantly across studies and among individual patients.⁴ FDA APPROVAL Approved for children aged 4 years and older. One of the most widely available options in the US, Europe, and Canada. GOOD TO KNOW The battery lasts 4–8 years. Hoarseness is a common side effect.	Only limited seizure-type specific information is available. One study showed that out of 7 patients whose most disabling seizures were tonic seizures, 1 became seizure-free, 2 had > 90 % seizure reduction, 2 had a 50–90 % seizure reduction, 1 had <50 % reduction, and only 1 showed no improvement.⁵ FDA APPROVAL Approved for adults (18+) with focal epilepsy. Use in LGS is currently investigational, being studied in ages 12+. GOOD TO KNOW Requires daily data uploads at home. The battery lasts ~10 years. Device and leads are both fully contained within the skull. Requires experienced team trained in device programming.	One study reported greater reduction in tonic-clonic (89 %), atonic (83 %), and absence (78 %) than tonic (66 %) seizures.⁷ FDA APPROVAL Approved for adults (18+) since 2018. Use in children with LGS is off-label but increasingly common. Anterior thalamic target approved in Europe, not yet in the US. GOOD TO KNOW Rechargeable battery can last up to 15 years. Requires experienced team trained in device programming.
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WHERE IS THE DEVICE?	DOES IT INVOLVE BRAIN SURGERY?	IS IT REVERSIBLE?	WILL MEDICATIONS STILL BE NEEDED?
Corpus Callosotomy: No device VNS: Device in chest + wire to neck RNS: Electrodes + stimulator placed in the skull DBS: Brain electrode + stimulator in the chest	Corpus Callosotomy: Yes VNS: No RNS: Yes DBS: Yes	Corpus Callosotomy: No-permanent VNS: Device can be removed RNS: Device can be removed DBS: Device can be removed	Yes-, anti-seizure medications will continue after surgery. Some families are able to reduce doses over time, but this is discussed individually with your care team.