

## Q And A: Treatments other than medication can be effective for drug-resistant epilepsy

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DEAR MAYO CLINIC: My daughter is in her 30s, and she has had epilepsy for years. Lately, her medication hasn't been effectively

preventing seizures. She's on a new medication, but her health care provider says that there is a chance it won't work either. What are her options if she cannot find a drug that works?

ANSWER: About 1 in 3 people with [epilepsy](#) become resistant to anti-seizure medication over time. This condition, called drug-resistant epilepsy, may be what's happening in your daughter's case. The chance of a person who develops drug-resistant epilepsy becoming seizure-free using anti-seizure medication is less than 5%.

Your daughter may be a candidate for other treatments that can be effective for drug-resistant epilepsy. They include brain surgery, electrical stimulation [therapy](#) and immunotherapy. To find the approach that's right for her, she needs to be evaluated to better understand the nature of her epilepsy.

The tests involved in that evaluation typically include monitoring in the hospital with scalp video EEG recording, as well as a high-resolution brain MRI; a brain positron emission tomography, or PET, scan; and magnetoencephalography. Advanced brain imaging studies, such as functional MRI, may be part of the evaluation, too, along with neuropsychological testing.

Once testing is complete, a team that includes epilepsy doctors, brain surgeons, radiologists and psychologists should review your daughter's case. That team can recommend a treatment plan to fit your daughter's needs.

If the evaluation pinpoints the area in the brain where your daughter's seizures are coming from, and that area can be safely removed, then epilepsy surgery is an option. The procedure may be performed using open brain surgery or laser ablation therapy. With these procedures, the probability of being seizure-free afterward is 50% to 80%.

If the evaluation doesn't provide enough information for the team to offer a treatment recommendation, the next step is intracranial video EEG recording. For this procedure, a surgeon places recording electrodes on the surface of the brain or in deeper brain regions to pinpoint where the seizures are being generated.

If information from that test shows the seizures can be eliminated by removing the area of the brain where they are coming from without the risk of a functional deficit after surgery, then epilepsy surgery would be appropriate. If the test shows there are two areas generating seizures, then a treatment called brain electrical stimulation therapy usually is offered. This therapy also may be appropriate if removing brain tissue would result in functional problems after surgery.

Brain electrical stimulation therapy can be performed using a deep brain electrical stimulator or with an approach known as responsive neurostimulation. Both involve placing permanent electrodes in the brain. In general, seizure frequency is reduced by 50% to 75% with these treatments, and the amount of anti-[seizure](#) medication required may decrease.

If the evaluation indicates that your daughter may not benefit from [brain surgery](#) or brain electrical stimulation therapy, another choice, called vagus nerve stimulation, is available. Unlike other treatments, this approach doesn't require that the specific area of the [brain](#) generating the seizures be located. Seizure frequency may be decreased by 40% to 60% using vagus nerve stimulation therapy.

Dietary therapy also could be considered to reduce seizures, although this approach is more likely to work in children with drug-resistant epilepsy than adults.

Finally, in a small number of people with drug-resistant epilepsy, the

cause may be an autoimmune problem. If the care team suspects that that's the case for your daughter, they may recommend antibody testing. If an autoimmune issue is discovered, immunosuppressive treatment may ease seizures. Because your daughter may have drug-resistant epilepsy, she needs to be evaluated thoroughly at this time. If possible, her evaluation should take place at a specialized epilepsy center that can provide a comprehensive team approach to her care. A variety of treatment options are available that could significantly reduce your daughter's seizures and improve her quality of life.

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