

Pre-Surgical Information Sheet

PRE-SURGICAL EVALUATION FOR MEDICATION-REFRACTORY EPILEPSY

Your epileptologist (seizure doctor) would like you to start the pre-surgical evaluation, which will determine if surgery could be a safe, effective option to stop or reduce your seizures. The evaluation is tailored specifically to you and any recommendation is based on unique details of your seizures and their impact on your life. **We would never schedule surgery without discussing it with you and your family, or without your approval.**

With the pre-surgical evaluation, we will answer two important questions:

1. **Are there specific areas of your brain causing the seizures?**
2. **Is there a surgical treatment that would be safe to do on that area without causing other problems?**

To help answer these questions, your epileptologist will order many medical tests for you to complete. Tests can be done as close to your home as possible, but some require coming to Hartford. Most can be done in an outpatient setting, while others require a stay at Hartford Hospital.

The decision of whether surgery is safe for you is a very important one, guided by the Refractory Epilepsy Committee (REC), a multi-disciplinary panel of experts that includes epileptologists, neurosurgeons, neuropsychologists, neuroradiologists, health psychologists and others involved in your care.

There are often many rounds of testing as part of the evaluation. When initial testing is complete, the REC meets and reviews your case. Additional testing may be recommended, followed by another full review and sometimes even more tests. In the end, the REC will determine whether surgery would be a good treatment for you. Your epileptologist will explain the options available to you so you can choose the best one for you.

Think of this process as “a marathon, not a sprint.” For most people, the testing and decision-making takes about six months, but it could take a year or longer.

TESTING:

You may be scheduled for any or all of these tests on your pre-surgical evaluation journey:

1. **Video EEG (electroencephalogram) monitoring:** Performed at our Epilepsy Monitoring Unit (EMU) at Hartford Hospital, this is a three- to six-day inpatient visit to record your seizures. You may have already had this done to classify your seizures.
2. **3T MRI (magnetic resonance imaging):** This high-resolution MRI looks for any abnormalities in the shape of the brain or injuries to the brain that may cause seizures. It is an outpatient test.
3. **Neurocognitive evaluation:** This is an outpatient neuropsychology visit that takes a few hours and involves a full evaluation of the types of thinking we all do, including learning, memory, language, spatial skills, attention and problem-solving. Since areas of your brain involved in seizures may not be working as well as others, the normal functions of the seizure area may be affected. Seeing which particular types of thinking are your strongest and weakest can help guide our surgical planning and avoid problems that could be caused by surgery.
4. **Psychological evaluation:** Surgery is a big deal and there is a lot to think about. This evaluation will explore factors that impact how you manage the pre-surgical workup and actual surgery, such as your support, family situation, life stressors and coping skills, as well as your expectations for surgery. This will help your epilepsy team find ways to best support you through the process.
5. **PET (positron emission tomography):** An outpatient imaging test to identify areas of the brain where seizures start, and involves a very low amount of short lasting radiation.
6. **SPECT (single photon emission computed tomography):** This test – which requires an inpatient stay in the EMU at Hartford Hospital and can take about five days - shows blood flow in the brain during and between seizures. We will inject a small amount of radioactive dye into your bloodstream at the moment a seizure occurs to show the part of brain that is most active during the seizure.

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7. **fMRI (functional MRI):** This outpatient test measures brain activity by detecting changes associated with blood flow, helping to determine which parts of your brain are involved in such important activities as language and memory. We use it to help determine the safety of particular surgeries that might be recommended to you.
8. **Wada test:** Important in determining the safety of surgeries that might be recommended to you, this test determines which side of your brain is most needed for critical functions such as speech and memory. This procedure is done in the operating room and involves placing a catheter in the artery in your hip. Most patients go home the same day.
9. **MEG (magnetoencephalography):** To have this test – which involves using very sensitive magnets to determine where in the brain seizures may be starting – you must travel to a city where MEG facilities are located. When we suggest this test, our team balances cost, travel expenses and the need to get the best information we can from the most knowledgeable MEG providers.
10. **Intracranial EEG:** To more accurately locate the portions of your brain involved in your seizures, we may suggest surgery to place recording electrodes inside the skull instead of just scalp electrodes. Think of scalp EEG as identifying the city, but intracranial EEG giving the street address. Our neurosurgeon Dr. Brendan Killory performs this safe, diagnostic surgical procedure during an inpatient hospital stay in the EMU at Hartford Hospital.
11. **Cortical Mapping:** Once intracranial electrodes are implanted in or on the brain, we can use them to “map” the brain by giving small electrical impulses to specific brain areas to test the functions of those areas. This can help to determine which areas of your brain perform language, movement, vision and other critical functions, so we can avoid harming these areas during treatment surgeries.

The goal is to collect the most complete data so we can suggest the best treatment options.

TREATMENTS:

Most people who are good candidates for surgery pick the treatment by balancing safety and a chance to stop the seizures. Your epileptologist will guide you through the options to choose what might be best for you.

Types of surgical or procedural treatment that may be recommended include:

1. **Resection:** This surgery – removal of the part of the brain likely causing your seizures – is often the best chance at a cure for epilepsy. We only recommend this surgery if the benefits of surgery far outweigh the risks of any permanent injuries. Dr. Brendan Killory performs resection surgeries in the operating room.
2. **Ablation:** Dr. Killory also performs this procedure in the operating room and partly in the MRI scanner, using heat to destroy a very small area of brain that seems to be causing the seizures. Considered minimally-invasive because it does not require removing any parts of your skull, it has a relatively quick recovery time.
3. **Responsive Neurostimulation (RNS):** In the operating room, the surgeon permanently implants a stimulation device in or around the area of brain causing seizures. The device monitors the brain all the time and tries to stop seizures as soon as they start. Your epileptologist can review data from your brain recorded by the stimulator to see how well it is working and make any needed adjustments during an office visit. You can find more information at www.neuropace.com.
4. **Stimulation of the Anterior Nucleus of the Thalamus for Epilepsy (SANTE)/deep brain stimulation (DBS):** Electrodes are placed in a deep part of the brain called the thalamus that controls the connections to large areas of brain. These electrodes are connected to a stimulator that gives a regularly set impulse, like a “pacemaker for the brain.” Adjusting activity in the thalamus can help control activity of large areas of the brain, making it harder for seizures to start.
5. **Vagus Nerve Stimulator (VNS):** This “pacemaker for the brain” is implanted in the shoulder with a wire connected to the Vagus nerve in the neck, giving an impulse every few minutes to help adjust brain patterns and prevent seizures from starting. Some of these do “autostimulation” that tries to time stimulation to the moment a seizure is starting to stop it immediately. Some patients use a hand-held magnet to activate the VNS if they feel a seizure starting, which can make the seizure shorter or even stop it. Read more at <http://www.livanova.cyberonics.com>.

Remember, you may not need to have all of these treatments. Most people only need to have one.

For more information, go to:

- www.epilepsy.com
- www.patientslikeme.com/conditions/3

If you have any questions, or feel your progress through the pre-surgical evaluation process has slowed, please call our office at 860.972.3621.

