

Tests Before Epilepsy Surgery

If your child's doctor determines that epilepsy surgery may be a good treatment for your child, they will order additional tests.

To make sure that surgery is right for your child, we do tests to learn about your child's brain. This flyer tells you about some of the tests.

Why does my child need more tests?

The tests help your child's healthcare team to learn more about your child, including:

- Find where seizures are coming from.
 - Locate where the movement, speech and memory areas are in your child's brain. provide information how treatment is working
 - Show the impact of the seizures on your child's overall health and brain function.
 - Know if surgery can help your child
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What kinds of tests will my child get?

These are some of the tests that you child might have. This flyer will only describe the tests in general. Please ask your child's nurse or doctor if you want to learn more about any of these tests.

Long-term video EEG monitoring

Long-term video monitoring is an EEG (electroencephalogram) test that looks at your child's brain waves over a long period of time. We will also record your child on camera to see what happens when your child has a seizure. The purpose of this test is to find out where seizures are coming from in your child's brain.

For this test, you and your child will stay in the hospital on the Epilepsy Monitoring Unit (EMU) for 24 hours or longer. You or another parent or caregiver will need to stay with your child the whole time that we are monitoring them. You will be an important member of our team in helping your child's healthcare team to know when seizures are happening. For more, read "Inpatient EEG Tests: Long Term Video Monitoring" seattlechildrens.org/pdf/PE619.pdf or visit seattlechildrens.org/clinics/neurosciences/what-to-expect.

To Learn More

- Neurology
206-987-2078
- Ask your child's healthcare provider
- seattlechildrens.org

Free Interpreter Services

- In the hospital, ask your nurse.
- From outside the hospital, call the toll-free Family Interpreting Line, 1-866-583-1527. Tell the interpreter the name or extension you need.

Neuropsychological Evaluation

Neuropsychological evaluations are another way of looking at your child's brain. These evaluations help us to understand your child's brain functioning for memory, attention, language and other skills. These are important to help with pre-surgical planning. They may help find where the seizures start and understanding your child's risks, like that described below under fMRI.

These evaluations may also help with school planning and behavior management. They involve answering questions with the parent (and older teenagers), direct testing with your child (unless your child is an infant or does not speak), and feedback with you to go over evaluation results.

MRI

An MRI (magnetic resonance imaging) takes pictures of your child's brain. This will help us see small details in your child's brain. A clear picture helps us understand your child's seizures and structure of the brain. The test usually lasts 30 to 60 minutes. If your child is very young, or cannot hold still for this long, we may need to use anesthesia. For more, see 'Anesthesia for Radiology Tests' seattlechildrens.org/pdf/PE1999.pdf.

Your child may need an MRI even if they have already had one. The picture for surgical evaluation must be very clear. Your child's doctor will determine when and if one is needed.

To learn more about this test, read "Magnetic Resonance Imaging (MRI): Preparing Your Child for a Scan" seattlechildrens.org/pdf/PE017.pdf.

Social Work assessment

A social worker will talk with you and your child as part of the Epilepsy Surgery evaluation process. It can be a very stressful process for your child and for the family. Social workers can help you and your child with emotional support, resources, and many other kinds of support.

fMRI

The fMRI (functional MRI) helps us to find where language, memory and movement are controlled by the brain. It is similar to the MRI, but instead of just looking at the physical parts (structures) of your child's brain, it looks at blood flow in the brain to see what parts of the brain control specific tasks or activities. This test makes sure that these areas are not in the same place as where your child's seizures start. If it is, surgery might not be the best treatment option because it might do damage to your child's ability to do things, like talk or move.

During the fMRI test, we will ask your child to do different tasks, like tap their finger to their thumb. While they do the tasks, we look at where in the brain the signals are coming. This helps us to "map" the brain.

Before doing this test, your child's neuropsychologist will help you and your child get ready. Usually, we do 1 to 3-hour long preparation sessions, and sometimes the neuropsychologist may give you materials to work on with your child to help him or her prepare.

The actual scan and testing will take about an hour. Like with the MRI test, your child will be awake during the test and will need to stay very still.

Wada test

The Wada (WAH-dah) test looks at each side of the brain to see the parts that control language and memory. Usually, we do a Wada test if:

- We do not learn what we need to know during the fMRI test
- The fMRI test shows that language or memory are happening on both sides of the brain

Before the test, your child will have 2 or 3 practice sessions with their neuropsychologist. These will each last about 1 hour.

The Wada test takes 2 to 3 hours. Your child will be awake for the test. This test happens in the hospital and your child will need to stay for 6 hours afterward.

Before the test, your child will be hooked up to an EEG to monitor for seizures. Your child will also have an IV (intravenous line) placed just in case an emergency happens and your child needs to be put to sleep.

During the procedure your child will have a small plastic tube (catheter) put into a large artery in their thigh (femoral artery). This allows the radiologist to take a picture of the blood vessels in the brain (cerebral angiogram). This is to make sure there is blood flow to safely inject medicine into the blood vessels in your child's brain. The medicine will put 1 side of your child's brain to sleep. After the injection, your child's neuropsychologist will test your child to see if they can do the tasks they learned during the practice sessions.

This test has some risks because we use anesthesia and because it involves a cerebral angiogram. Your child's healthcare team will talk to you about the risks before the test.

PET Scan

A PET scan (Positron Emission Tomography scan) is a test to show how the cells in your child's brain use sugar (glucose) for energy.

The test will last about 1 to 2 hours. Before the test, your child will be hooked up to an EEG to monitor for seizures. Your child will also have an IV placed so that a radioactive tracer can be injected into the blood vessels in your child's brain. This lets us see how your child's brain uses glucose. For more, read "PET/CT Scan" seattlechildrens.org/pdf/PE310.pdf.

What happens when the tests are done?

It may take weeks for the test results to be finalized. When this happens, your child's doctor will present the results of the tests at a meeting called an epilepsy conference. All the members of your child's healthcare team discuss the results and recommend next steps at this meeting. Your child's healthcare team will contact you after the conference.

What are the possible recommendations for my child?

Surgery recommended

If your child's healthcare team has found where your child's seizures start from, and if they know it will not be too harmful to do surgery, then we can schedule surgery.

Surgery not recommended

Surgery is not a good option for your child. Your child's doctor may have other treatment options to consider.

Surgery for grid, strip or depth electrode placement recommended

This is recommended if the tests did not give your healthcare team enough information about where your child's seizures start.

For this test, your child will need to stay in the hospital for 5 to 7 days. If your child does not have seizures during the stay, they may need to stay longer.

Your child's healthcare team will do surgery to place small strips of electrodes on the surface of your child's brain, or depth electrodes deeper in the brain. Electrodes are small sensors that record brain activity. These help your child's healthcare team to learn exactly where seizures are coming from. After testing, your child's healthcare team will do another surgery to take the strips of electrodes off of your child's brain. To learn more about this test, see "Surgery for Grid or Strip Placement" seattlechildrens.org/pdf/PE833.pdf.

Find more information about epilepsy and tests before epilepsy surgery at seattlechildrens.org/midaz.