**Tests Before Epilepsy Surgery**

There are different kinds of epilepsy surgeries. These surgeries cut out or separate the part of your child’s brain where seizures start from the rest of their brain. Your child’s healthcare team will do tests on your child before deciding if epilepsy surgery is the best option. These tests also help to locate where the movement, speech and memory areas are in your child’s brain. Knowing where these areas are and where seizures start will help your child’s healthcare team know if surgery can help your child.

We will not do any tests until your child’s healthcare team has decided that surgery may be an option. First, your child will need to be referred to Seattle Children’s Hospital by your primary neurologist. The Neurology Epilepsy Surgery scheduler will call you in about a month to set up appointments at Children’s.

**Why does my child need these tests?**

All children who we consider for epilepsy surgery will get different tests depending on the kind of seizures they have. We need to do these tests to find out where seizures are coming from and if we can do surgery. For some tests, you may also get a flyer that explains a test in more detail. If you have other questions, please call the Epilepsy Surgery nurse at 206-987-1496.

**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 if you want to learn more about any of these tests.

Usually, your child will get a first set of tests to find out about your child’s brain and if epilepsy surgery might work for your child. After that, we may do more tests. Your child’s healthcare team will talk to you about these at each step.

**Long-term video EEG monitoring (phase one)**

This is usually the test that your child will start with. The purpose of this test is to find out where seizures are coming from in your child’s brain. To do this, your child’s healthcare team will monitor your child’s brain for seizure activity. We will also record your child on camera to see what happens when your child has a seizure.

For this test, your child will stay in the hospital for 5 to 7 days. 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 information, refer to the flyer called Long Term Video/EEG Monitoring.
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Neuropsychological testing

Neuropsychological (nur-oh-sy-kuh-LAH-juh-kul) testing is a very important test for all patients being evaluated for Epilepsy Surgery. Neuropsychology is another way of looking at your child’s brain. The neuropsychologist will check your child’s brain development and behavior. They will also your child’s memory, attention, language and other skills. It will also help us find out about your child’s strengths and weaknesses. These will be important to know as we work with you to plan medical treatment, school planning and how to manage behavior.

This test lasts between a half and a whole day. If your child is very young or if they do not speak, your child’s neuropsychologist will ask you questions about your child and their development during a one hour interview.

MRI

Another important test is an MRI, or “magnetic resonance imaging.” An MRI takes pictures of your child’s brain. This will help us see small details in your child’s brain. Seeing a clear picture of these details will help us understand more about your child’s seizures and structure of the brain. The test will usually last about 30 to 60 minutes. If your child is very young, or cannot hold still for this long, we may need to use anesthesia.

Your child may have already had an MRI. Because we need to see a very clear picture, we may need to do another one. If you have a recent MRI image of your child’s brain, please bring it with you when you bring your child to the first visit at the hospital. We will do another one if we need to. If your child has not had an MRI, the doctor will determine when and if one is needed.

To learn more about this test, please see the flyer called Magnetic Resonance Imaging (MRI): Preparing your child for an MRI scan.

Social Work assessment

Your child will talk to a social worker as part of the Epilepsy Surgery evaluation process. Your child’s social worker can help to identify needs and ways to support the whole family. When a child is diagnosed with a neurological disorder, it can be very stressful for them and for the family. Social workers can help you and your child with emotional support, resources, and many other kinds of support.

If you would like to learn more about this very important part of your child’s healthcare team, please see the Social Work Web page in Our Services on Children’s Web site.

When can I expect results from the first set of tests?

When your child is finished with these initial tests, you will go home from the hospital. Two weeks later, the epilepsy surgery team will meet to talk about the test results and about what will happen next. Then, the epilepsy surgery nurse coordinator will call you to talk to you about results and will suggest next steps.

If we recommend that surgery is a good option, we may need to do more tests to make sure that the surgery would not be harmful to your child. If your
child’s healthcare team decides that surgery is not a good option, we will stop doing tests and will talk to you about other possible treatments for your child.

**What kinds of tests will my child get to make sure that surgery will not be harmful for them?**

If surgery is an option, it is important to do tests to make sure that your child’s language, movement and senses would not be harmed by it. These tests are listed below.

**fMRI**

This test is called a functional brain MRI. It will help 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, we want to look at what parts of the brain are involved in specific tasks or activities. This test is done to make 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, since it might do damage to your child’s ability to talk, move or other important functions.

During the fMRI test, we will ask your child to do a variety of different tasks. For example, we will ask your child to tap their fingers together. We will then look at where the brain sends signals from to make your child tap their fingers. This helps us to “map” the brain.

Before the test, your child will have 2 to 3 practice sessions with their neuropsychologist. These will each last about an hour. 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 which part controls language and memory function. If we do not learn what we need to know during the fMRI test, your child’s healthcare team will probably need to do a Wada test. We might also need to do a Wada test if the fMRI test shows that language or memory are happening on both sides of the brain.

Before the test, your child will have 2 to 3 practice sessions with their neuropsychologist. These will each last about an hour. The test takes about 2 to 3 hours. Your child will be awake for the test.

Your child will have this test at the hospital and 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 (intervenous line) placed so that a medicine can be injected into the blood vessels in your child’s brain. This is done to put your one 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 anethesia. Your child’s healthcare team will talk to you about the risks before the test.
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PET Scan
A PET scan, or “positron emission tomography” (POZ-uh-tron ee-MISH-un tuh-MOG-rah-fee) is a test to show how the cells in your child’s brain use sugar, or glucose (GLUE-kose) for energy. This test may help to find the area in your child’s brain where seizures come from by finding the part of your child’s brain that absorbs glucose differently from other parts.

The test will last about 1 to 2 hours. Before the test, we will place an IV and inject a radioactive tracer through the IV line. This lets us see which part or parts of the brain are functioning as they should and which are not. During the test, we will also monitor your child with an EEG for any seizures.

For more information, please see the flyer PET/CT Scan.

Once these tests are done, will my child be ready for surgery?
If your child’s healthcare team has found where in your child’s brain seizures start from, and if they know it will not be too harmful to do surgery, then we can schedule surgery.

But, sometimes the tests still do not tell your child’s healthcare team where in the brain your child’s seizures start from. Or else, the area that we find is too large, and we need to narrow down the location that the seizures are starting from. If this is true for your child, your child’s healthcare team may have to do one more test. This test involves surgery and is called “grid placement” or “strip placement.” Like with the Wada test and fMRI, this helps your child’s healthcare team map your child’s brain.

Surgery for grid and strip placement
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 this time, they may need to stay a little longer than 7 days. Your child’s healthcare team will do surgery to place small strips of electrodes (el-ECK-trodes) on the surface of your child’s brain to monitor for seizures. 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, please see the flyer called Surgery for Grid or Strip Placement.

To Learn More
- Neurology Epilepsy Surgery Scheduling 206-987-1496
- Ask your child’s healthcare provider
- www.seattlechildrens.org

Free Interpreter Services
- In the hospital, ask your child’s 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.

Seattle Children’s offers interpreter services for Deaf, hard of hearing or non-English speaking patients, family members and legal representatives free of charge. Seattle Children’s will make this information available in alternate formats upon request. Call the Family Resource Center at 206-987-2201.

This handout has been reviewed by clinical staff at Seattle Children’s. However, your child’s needs are unique. Before you act or rely upon this information, please talk with your child’s healthcare provider.

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Neurology