Epilepsy: Presurgical Testing

Why do I need testing?

You are being asked to complete testing to determine if brain surgery is an option to treat your epilepsy. The results of the tests will help you and your doctor decide whether brain surgery is a good option for you.

What tests will I need?

Three of the most common tests are discussed in this document: **neuropsychological** [NER-oh-seye-koh-LOG-ik-uhl] **testing**, **Wada** [WAH-duh] **testing**, and a special kind of **EEG testing**, also called **positron** [PAHZ-eh-tron] **emission** [eh-MISH-uhn] **tomography** [tuh-MAH-gruh-fee] **(PET) EEG**. You may need one or more of these tests.

Neuropsychological testing

A neuropsychological test provides information about your cognitive (thinking) and other related skills. The test is designed to find out how epilepsy may be affecting you. It can include questions in the following areas:

- Memory
- Ability to process information quickly
- Language
- Problem solving and reasoning
- Day-to-day tasks

Here's what to expect:

1. Testing usually begins with an interview that lasts between 30 and 40 minutes. You and a close friend or family member will be asked about your background, medical history, and any current symptoms you are experiencing. Any recent changes in thinking abilities and mood or emotions are important to report during this discussion.

2. Next, you will be given a series of questionnaires and several activities that test your memory and concentration. Testing usually takes about 4 hours total — sometimes a bit less, sometimes a bit longer. You may take breaks as needed.

How do I prepare for neuropsychological testing?

1. Bring someone who knows you well, such as a spouse/domestic partner, close friend, parent, or adult child. They can provide helpful details during the interview portion of the testing. They will only need to stay for the first 30–60 minutes.
2. Remember to bring your hearing aid, reading glasses, and other similar devices if you use them.
3. Feel free to bring a drink and snack with you

See **pages 2 to 3** for information about other tests you may be having.

Wada testing

The **Wada test** evaluates which side of your brain is most important for your speech and memory. Your doctor needs this information to evaluate your risk of problems in these areas after epilepsy surgery.

The Wada test involves a special form of X-ray called angiography [an-jee-AH-gruh-fee] to take pictures of the blood vessels in and around your brain.

Here's what to expect:

1. A technologist will attach small discs (electrodes) to your scalp using a small amount of cream and gauze to hold them in place. These will allow your doctor to monitor your brain activity.
2. A nurse will prepare you by placing an IV in your arm, taking your blood, asking some medical questions, and doing a focused physical.
3. After your upper leg is cleaned, an anesthetic (numbing medicine) will be injected to numb the area. Once your skin is numb, a small, IV-like device (sheath) will be placed into the leg artery to allow doctors to access your artery. Using a small catheter (tube), the doctor will take images of the blood vessels in and around your brain.
4. You will receive an injection of medication that may make you feel sleepy and unable to move one side of your body. This is temporary and typically lasts less than 10 minutes. You will not feel any pain.
5. The Wada procedure will begin. The neuropsychologist will test your speech and memory.
6. Once the testing is complete and the medication has worn off completely (after about 30 minutes), the opposite side of the brain is tested similarly to the first. Your testing will take about 2 hours.

What happens after the test?

7. After testing is complete, the catheter and sheath will be removed, and a band-aid will be placed on your leg. You will be taken to a room where you will recover for about 2 hours. You will be able to watch TV, eat lunch, and sleep during this time.

How do I prepare for Wada testing?

1. Do not eat or drink after midnight the night before your test. Take your medications with a small sip of water.
2. Bring your medications in their original bottles to your appointment.
3. You need to have someone who can drive you home after your appointment.
4. Tell a doctor or nurse right away if you:
   - ☐ Take any medication that may affect blood clotting (e.g., Heparin, Coumadin, Lovenox, Plavix, aspirin)
   - ☐ Have a bleeding disorder
   - ☐ Have an allergy to iodine or contrast dye used in radiology

Things to remember after Wada testing

1. You may resume normal activity 24 hours after the procedure if you feel up to it; however, avoid sitting for long periods of time until the puncture site heals.
2. You can shower 24 hours after the procedure, but do not soak in a tub or go swimming for 5 days.
3. Avoid heavy lifting (no more than 10 pounds) and strenuous activity for 5 days.
4. Follow the special instructions you receive when you leave the hospital.

See **page 3** for information about other tests you may be having.

PET scan with EEG (PET EEG)

A **positron emission tomography (PET) EEG** is a test that allows doctors to learn more about where the seizures are coming from in your brain. There are two parts to the test that take places at the same time: the PET scan (which makes images of your brain), and the EEG test (which records electrical activity in your brain through sensors on your scalp).

How does a PET scan work?

Unlike other imaging tests, such as CT or MRI scans, PET scans show your tissues at the cellular level, which provides your doctor with the most information about complex syndromes such as seizures. This will help them better diagnose your problem and provide you with appropriate treatment.

How does an EEG work?

The EEG technician will put small metal tabs (electrodes) on your head. These do not hurt and do not give a shock, but just sit on the skin. These electrodes sense the brain's electrical messages and the EEG machine records these messages. They are stored on a computer so the doctor can look at it later.

Here's what to expect:

1. You will need to arrive three and a half hours before your scheduled PET scan. Shortly after you arrive, the EEG technician will attach the EEG leads to your scalp.
2. Your brain activity will be monitored by EEG for about 2 hours prior to the PET scan.
3. You will have an IV placed in your arm. You will receive an injection (shot) of a dye, called a tracer, that will help to create the images of your brain.
4. The PET scan part of the test will occur in a dimly lit room. You will be asked to relax (avoid speaking, reading, or any big movements) just before and during the scan.
5. You will be placed in a scanner where you will lie down on your back. The top of the scanner will be open (not enclosed like an MRI). The scan will begin about 30 to 45 minutes after the injection and will last about 10 minutes. The technician will tell you when you need to remain still. You may be asked to hold your breath for short periods of time. You will hear buzzing and clicking noises during the scan.
6. When all the necessary images have been recorded, you will slide out of the machine.

What happens after the test?

Before you leave the hospital, the electrodes attached to your scalp will be gently removed, and you will be able to go about your day normally. Your doctor will give you the results, typically within 1 week of the test.

How do I prepare for a PET scan with EEG?

1. Come to your appointment with clean, dry hair.
2. If you are pregnant or think you might be pregnant, notify the staff immediately. Radiation such as that used in a PET scan can be unsafe for developing babies.