



Children's  
of Alabama®

## E-NEWS for Epilepsy

### The Who, What, When, Where and Why of Epilepsy Surgery

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#### WHO

A diagnosis of epilepsy is given to a person who has had two or more unprovoked seizures. About 50 to 60 percent of people will become seizure-free after taking the first seizure medication prescribed by their doctor. A second seizure medication may help another 10 to 20 percent of people become seizure free. By the time a child tries a third medicine, the chances of becoming seizure-free with medicine alone are very small. About one-third of patients diagnosed with epilepsy become intractable, meaning they have uncontrolled seizures despite multiple medications. For these patients, we study their seizures more closely to find other ways to help control them. This is when the possibility of epilepsy surgery enters the picture.

#### WHAT

Before any surgery is considered, a battery of tests is needed. These tests help us determine the type of surgery needed, potential outcomes of the surgery and if surgery is something we can offer.

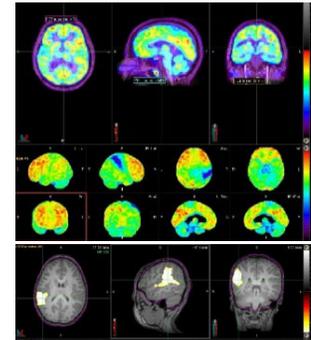
We will bring the child into the Epilepsy Monitoring Unit (EMU) for **video EEG** monitoring for several days up to a week. We need enough time to capture several seizures to help localize where the seizures start in the brain. During video EEG monitoring, we often lower the doses of seizure medications or stop them completely in order to capture seizures.

Even if the patient has had an **MRI scan** of the brain before, we may obtain a more detailed MRI necessary for surgical planning.

Sometimes, the epileptologist will order a **PET scan**. Epileptogenic areas in the brain (typically the areas involved in a seizure) do not metabolize glucose as well as other areas. This color-coded image helps us with potential regions in the brain that are involved in seizure generation.

Sometimes, we also obtain a **SPECT** scan. This involves injecting a radioactive isotope through an IV at the beginning of a seizure. It requires a week-long admission to the EMU. We have a nurse sit at the bedside each morning from 8 a.m. to noon watching for a seizure. When the seizure starts, the EEG technologist indicates to the nurse to inject. Once that is done, the patient is taken down to the Nuclear Medicine area and the scan is obtained. Another IV injection is done on a separate day when the patient is not having a seizure and a scan is obtained. The two scans are subtracted to identify the "hot spot" of increased blood flow, which can help indicate where the seizure starts.

There are several tests that may be done depending on the child's particular situation and type of seizures. These include **neuropsychological testing, visual field testing, magnetoencephalography (MEG), functional MRI**, and for some older children, a **WADA test**. Not all children need all the available tests.



#### WHEN

After the epileptologist gathers the information from these tests, the patient's data is presented at our epilepsy management conference that meets approximately once a week. The conference is attended by the epileptologists in our group, neurosurgeons who specialize in epilepsy surgery, a neuropsychologist, radiologists, nurses, EEG technologists and other members of the EMU care team. A discussion ensues about the area of the brain that seems to trigger the seizures, the risks/benefits of surgery for the particular patient and which surgical treatment would likely be the most successful. When a consensus is reached, the epileptologist or epilepsy surgery coordinator lets the family know the outcome of the conference. At that point, a clinic visit with the neurosurgeon is scheduled to further discuss the surgical treatment and answer questions about the surgical process.

There are many types of epilepsy surgery. Each type of epilepsy surgery looks different and the recovery process for each is different. Many times, an invasive, intracranial evaluation is needed before the final surgery. The evaluation involves a subdural grid or stereotactic placement of depth electrodes inside the brain. The intracranial evaluation typically lasts one week while the child is hospitalized in the EMU. The seizures are recorded in more detail and their origin is further fine tuned by the epileptologist.

#### WHERE

All surgeries take place at the Benjamin Russell campus on the third floor. After electrode implantation, the child may spend the night in the Pediatric Intensive Care Unit (PICU). The remainder of the stay is typically in the EMU. If brain tissue is removed, the child may stay in the PICU for a few days or recover on the regular floor.

#### WHY

Our goal is to help children with epilepsy have the best quality of life possible and to help families decide how that can best be accomplished. At this time, epilepsy surgery is the only treatment available that offers patients a chance for a cure for seizures. Although surgery is not a good option for everyone, we strive to identify patients for whom surgery may be a viable possibility while discussing the possible treatment options.