

# Epilepsy Surgery

## MEG

AT CHILDREN'S HOSPITAL OF PITTSBURGH OF UPMC, we believe parents and guardians can contribute to the success of this procedure and we invite you to participate. Please read the following information to learn about the procedure and how you can help.

### Fast Facts About MEG

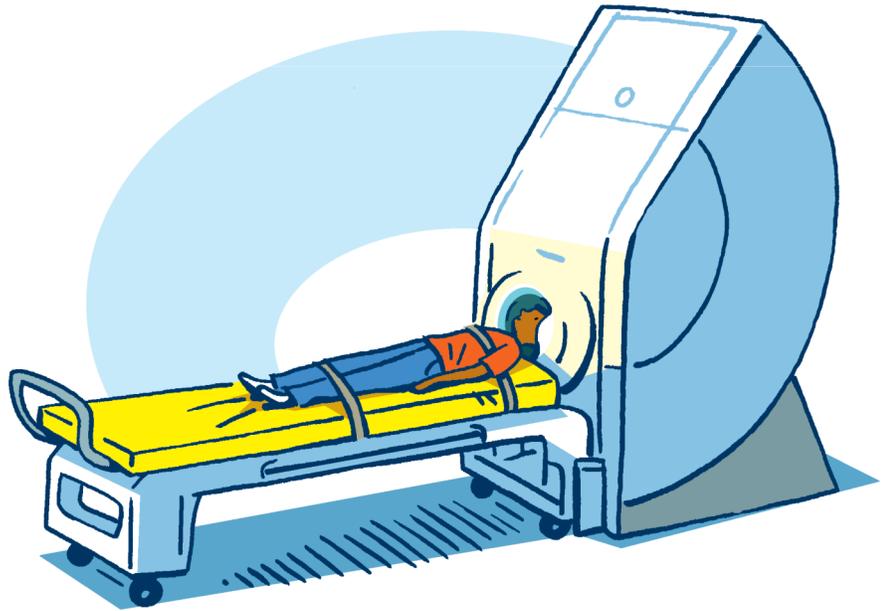
- The MEG study is a test to find the area deep within your child's brain that is causing his or her epileptic seizures.
- Your child should get less sleep than usual the night before the test so he or she will nap during the test.
- Wash your child's hair the night before the test, but do not use any oil, gel, mousse, or hairspray, and leave hair loose for the test.
- Your child should not wear a shirt or top with heavy metal zippers, buttons, magnets, or metallic paint. This test cannot be done if your child has metal braces on his or her teeth.
- The MEG study takes place on the outside of your child's body and will not hurt.
- The MEG study itself takes about 1 hour to complete, but your entire visit may take up to 4 hours total because of preparation time.
- This test is done in the Radiology Department at UPMC Presbyterian.

### What Is MEG?

Magnetoencephalography (*mag-NET-oh-en-seph-uh-LOG-gruff-ee*), or MEG, is a test that uses sensors to form an image of magnetic fields produced within the brain. Doctors use these images to pinpoint areas of brain activity that indicate epilepsy. MEG is one of several tests that your child's doctor may order to see if surgery is an option to control your child's epilepsy.

When MEG is used with MRI, a test that shows the brain's structure, the combination of images can show precisely which areas of the brain may be causing the seizures and which areas are working normally.

MEG is completely noninvasive, meaning that all testing is done on the outside of the body, and it does not hurt. No shots or needles are used, and there is no exposure to radioactivity or x-rays. It is similar to electroencephalography (EEG) and uses the same type of electrodes on the scalp as EEG and Video EEG testing. There is no risk involved with the MEG.



### Home Preparation

Before your child's MEG scan:

- Your child should not have any caffeinated drinks on the morning of the test. These drinks include caffeinated soda (pop), coffee, and tea.
- Your child can eat a normal breakfast before the test.
- Wash your child's hair the night before the test, but do not use any oil, gel, mousse, or hairspray. Please do not braid or pull up long hair, and do not use any hair extensions. Hair should be loose for the test.
- You will be given special instructions about putting your child to bed later than usual the night before the MEG and waking him or her up early on the morning of the test. Do not allow your child to sleep in the car on the way to the test. The MEG test needs to be done when your child is sleepy or asleep to get the right information.
- Give your child his or her medications as usual, unless your doctor tells you otherwise.
- On the day of the test, have your child wear a top that does not have any heavy metal zippers, buttons, or magnetic parts.
  - Girls should not wear a bra with underwire.
  - Your child should not wear any jewelry to the test; if your child has any body piercings, the jewelry must be removed.
  - If there is metal on your child's clothing, he or she may be asked to change into a gown before the test. Zippers on pants are usually ok.

## MEG cont'd

- Your child should not wear any kind of makeup, lotion, or cream on the face or body.
- If your child wears glasses, they will need to be removed before the test; contact lenses may be worn during the test.
- You may bring along a “comfort” item — such as a stuffed animal or “blankie” — for your child to hold during the test.
- Most children are able to have the MEG without any kind of sedation; but if sedation was ordered for your child, **there are important rules for eating and drinking that must be followed the night before and the day of the test.** One business day before your child’s procedure, you will receive a phone call from a scheduling nurse between 1 and 9 p.m. (Nurses do not make these phone calls on weekends or holidays.) Please have paper and a pen ready to write down these instructions.

### Getting Ready For the Test

The MEG scan itself takes about 1 hour, but getting set up for the test can take up to 2 hours. The length of your appointment may vary. Here is what to expect:

- The MEG test is done in a magnetically shielded room designed to keep out magnetic interference. The room is white and will have a bed and the MEG machine.
- Your child will be asked to remove his or her shoes to prevent magnetic dust from getting into the room.
- The MEG technician will be in the room and will explain the test to you and your child. You may ask questions at this time.
- Your child will be able to wear his or her regular clothing during the test as long as it contains no magnets, metal, or metallic paints; otherwise, he or she will be asked to change into a gown.
- Your child will be asked to lie down on the MEG bed.
- In order to make sure your child has nothing on that will interfere with the MEG, the technician will position your child’s head in the machine to check the quality of the signal before taking the recording. If there is interference, the problem will be fixed at that time.
- The technician will measure your child’s head and make small marks on the scalp with a washable marker or pen.
- Each marked area will be rubbed gently with a gritty lotion that helps the electrodes work better.
- Mild glue that can be removed later will be put on the electrodes, and the electrodes will be placed on each of the marks made on your child’s scalp. This process takes about 45 minutes.
- Four small flat metal coils attached to wires will be placed on your child’s head.
- Four electrodes may be placed on your child’s face to monitor eye movements.
- The electrodes and coils will be connected to the recording machines.

- A protective cap will be placed over your child’s head and a cloth may be inserted to keep your child’s head still during the scanning.
- Several straps will be placed snugly across your child’s body to keep him or her from rolling off the bed.
- The room will be darkened so that your child can relax and fall asleep.
- The technician will leave the room when the MEG is ready to begin, but can see your child with a video camera and speak to your child with a microphone within the room.

### The MEG Test

When the EEG electrodes and MEG coils are in place and the quality of the signal has been checked, the test is ready to begin. Because the MEG machine is very sensitive and will pick up the electrical brain activity of everyone in room, your child must be in the room alone; parents will be shown to the waiting room.

- When the parents have left the room, the technician will step out of the room and close the door to the magnetically shielded room.
- If your child is still awake, the closing of the door might be a little scary, but your child can talk to the technician with a small microphone in the room, and the technician can come into the room at any time, if needed.
- If your child is still awake, he or she will be asked to lie as still as possible. If your child is fussy, a parent may stay in the room until he or she falls asleep.
- The MEG will record your child’s brain activity in 6 segments of 10 minutes each, for a total of 1 hour.
- Although it is large, the MEG machine is very quiet and does not move.
- You will be called to the room when the test is almost over so you may be there when your child wakes up.
- When the recordings are done, the technician will wake your child so the scan can continue for a few minutes as he or she becomes alert.



## MEG cont'd

- When the scanning is done, the technician will enter the room to disconnect the electrodes and coils, and your child may go home.

### A Parent's/Guardian's Role

The most important role of a parent or guardian is to keep your child calm. The best way to keep your child calm is to be calm yourself. Knowing what to expect and explaining it to your child beforehand is the best way for both you and your child to be prepared for this procedure.

### After the MEG Test

- Your child may return to normal activities and normal eating and drinking after the test.
- Your child might have some sticky residue on his or her scalp or skin from the electrodes and coils. If any residue remains, your child may wash his or her hair at the hospital before going home.
- The recordings of your child's brain activity will be reviewed carefully by a MEG specialist, neurologist (brain specialist), and an epileptologist (epilepsy specialist). This review may take up to 2 weeks to complete. Your child's doctor should call you with the results in about 2 weeks.

### Special Needs

If your child has any special needs or health issues you feel the doctor needs to know about, please call the Division of Child Neurology before the procedure and ask to speak with a nurse. It is important to notify us in advance about any special needs your child might have. If you need to cancel or reschedule the MEG scan, please call the MEG scheduling area at 412-648-6425.



Pediatric Epilepsy Surgery Program  
Division of Child Neurology  
**Children's Hospital of Pittsburgh of UPMC**  
One Children's Hospital Drive  
4401 Penn Avenue  
Pittsburgh, PA 15224  
412-692-5520  
412-648-6425 MEG scheduling

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To see the list of all available patient procedures descriptions, please visit [www.chp.edu/procedures](http://www.chp.edu/procedures).