What happens first: I will be asked a series of medical questions to ensure that any metallic objects inside my body will not interfere with my magnetic brain waves while my head is inside the MSI sensor. A degausser may be used around my head to erase any magnetic activity from fillings in my teeth. If I have had any surgeries, I will be asked what they were. I will also have EEG electrodes glued all around my head and one placed over my heart. Three additional coils will be attached to earplugs that will remain in my ears throughout the MSI test. There will also be a dot placed by a magic marker between my eyes. Before I start the actual scan, I will be asked to remove all my clothing that has metal on/in them (underwire, zippers, snaps and sparkly paint) and change into hospital pants or gowns.

Taking a Digital Headshape: Then, I will lie down on the MSI bed and my headshape will be put into the MSI computer. This is done by touching the 5 coils and the dot placed between my eyes with a special wand that puts these points into the MSI computer. After these points are touched three times each, this wand will be used to “draw” the shape of my head. No marks will be made on me; they only show up on the computer. During the headshape, I MUST lie perfectly still so that the information recorded during the rest of the MSI test is gathered from the correct part of the brain. If I move, then the brain activity related to the movement may overwhelm the seizure spikes, giving my doctors the wrong information by showing activity from a different part of the brain.

After my headshape has been recorded into the computer, then I will lie down and get comfortable. There are pillows that can go under my knees and elbows and lots of blankets if it is cold. The sensor will be put over my head, but my face will be out so I can see. The coils and EEG electrodes will be plugged into the sensor.

About the scan room: When I am comfortable, then the technologists (and parent, if age or medical condition necessitates presence in the lab area) will leave the room where the sensor is and close the door. The door is very large and resembles a vault door. It is specially made so that magnetic interference from the computers and MRI scan next door do not interfere with my brain waves. Closing the door can be a little scary, but I will be able to hear what’s going on outside the room and I will be on video and intercom, so if I need anything, a technologist will be inside immediately.

Remaining Still: From this point on, the only thing I need to do is NOT MOVE MY HEAD. This is very important and some padding may be put next to my cheeks to help me not to move. As long as my head doesn’t move, all I have to do is take a nap which should be easy to do since the MSI sensor is very quiet and I will be very comfortable.

Types & Length of Tests: An Epilepsy Localization MEG/MSI test will take about three to four hours from beginning to end. If I need a break, all I have to do is tell the technologist. Sometimes, another type of MEG scan, called Somatosensory, may be needed if my seizures are coming from the area of the brain that controls my hands and feet. Then, this will take another 1 to 2 hours to complete. For this, little plastic tappers will be put on three to four of my fingers on one hand, possibly one toe, and possibly the same side of my outer lower lip. Each digit/limb that has a tapper on it will be tapped about 500 times. When the taps happen, the nerves at the end of my fingers/toes/lip send a signal to my brain which is mapped by the MSI sensor. Receptive Language Mapping may be needed if seizures are coming from the area of the brain that controls the understanding of language (what people are saying to me). This will take 1 to 1.5 hours to complete. For this task, thirty words will be piped into the room through tubes attached to earplugs inserted into my ears. Once the technologist is satisfied that I have absorbed some of the words into my memory, I will begin the task. This consists of me listening to the words again, except I will be told an additional ten words mixed in with the original thirty. My job will be to listen to each word and decide if I have heard this word today or not. If I have heard it, the technologist will ask me to raise my left index finger slightly to indicate I recognize the word. If I do not recognize the word from the list, I do nothing except get ready for the next word. I will be instructed to do this in a set of six with forty total words in each set. Six sets make one complete test, and we run 3 series of tests. By doing this test, my doctors will know which part of my brain (within 5 mm) controls my seizures, hands, feet, and language understanding if necessary.