UW Medicine

Grid Sensors

What they are and how they are placed

This handout explains what grid sensors are and how they are used. It also describes grid sensor surgery.

Why am I receiving this handout?

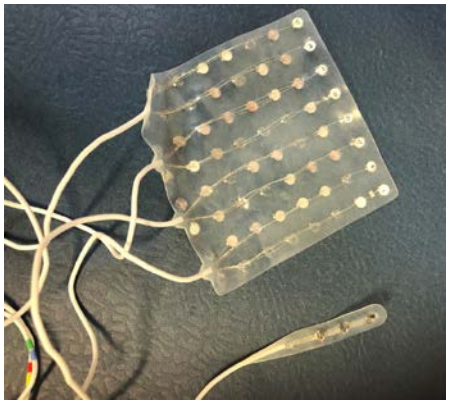
Before we consider *epilepsy surgery*, we need to learn as much as we can about your brain. Knowing where your seizures start will help us know what treatments will work best for you.

What are grid sensors?

We can use devices called *grid sensors* to see where your seizures start. These sensors are different than the electrodes we use for an *electroencephalogram (EEG)*. EEG sensors lay on top of your scalp. Grid sensors are placed right on the surface of your brain.

We use a grid sensor when we know which side of your brain your seizures are coming from, but we do not know if they start in the front or back of your brain. For instance, seizures may come from the right side of the brain, but it may be unclear whether they start in the *frontal* (front) or *temporal* (back) region.

A grid sensor is a stainless steel disc. The disc is attached to fine stainless wires that are embedded in a thin and soft sheet of surgical rubber. The sensors are connected to a computer. They will record the electrical activity of your brain in much greater detail than a standard EEG.



Grid sensors with grid wires

How are they placed?

Grid sensors are placed during surgery. Grid surgery is a *diagnostic* procedure. It will help us know if epilepsy surgery will be helpful in treating your seizures. If we feel that epilepsy surgery is a good option for you, it may be done during the same hospital stay.

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What happens during grid surgery?

During grid surgery, your surgeon will first remove part of your skull bone. This is called a *craniotomy*.

The surgeon will then place a grid sensor directly on your brain. They will then replace the part of the skull bone they removed. But, they will leave a tiny space in your skull and in the bandage for the grid wires to exit.

Grid surgery is done with *general anesthesia*. This means you will be asleep for the procedure. The surgery takes 4 to 6 hours.

What happens after surgery?

CT Scan

After surgery, you will have a *computed tomography* (CT) scan to check the placement of grid sensors. After the CT scan, you will be taken to your hospital room.

Monitoring

In your hospital room:

- EEG technologists will connect the grid wires to an EEG machine.
- The nursing staff who care for you specialize in caring for patients with seizures.
- A monitor technician will closely watch for seizures, and alert staff to help you right away.
- You will be on strict bedrest. You cannot get out of bed except to use the bedside commode.

Side Effects

Most patients feel pain in their head and in their jaw muscle after surgery. Nausea and vomiting are also common.

Medicines

You will receive:

- Medicines for pain and nausea as needed
- Antibiotics through your IV to limit the risk of infection

Some people have less pain and only need pain pills. Other people have stronger pain and need *intravenous* (IV) pain medicine.

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Seizures

The neurologist in charge of your care will likely reduce or stop your seizure medicines. This will help induce seizures so that we can monitor them. This process will be similar to what occurred when you had seizure monitoring with scalp EEG in the hospital.

While you have the grid sensors, the EEG recording of your seizures will show more precisely where your seizures start. This will help us know if epilepsy surgery is a good treatment for you.

Brain Mapping

If the grid sensors are on the side of your brain that controls your language and memory, we may need to do *brain mapping*. We use mapping to find out what areas of your brain are used for speech, language, movement, vision, or sensation. Language is controlled by the left side of the brain for most right-handed patients.

Brain mapping is usually done in your hospital room. Your neurologist will apply a small electrical current to the grid sensor. We will ask you to look at slides of objects or faces. If you have trouble naming what you see, it means we have found an area of your brain that handles language.

When is the grid sensor removed?

Most patients have surgery to remove the grid sensor about 1 week after it is placed. Some patients may have to wait 2 to 3 weeks if they do not have any seizures during the first week.

Surgery to remove the grid sensor is done with general anesthesia. The surgery will take 4 to 6 hours. You can expect to be in the hospital for 1 to 5 days after the surgery.

Will I also have epilepsy surgery?

In epilepsy surgery, doctors remove the part of your brain that causes your seizures. For some patients, epilepsy surgery can be done when the grid sensor is removed. But, epilepsy surgery is not the best treatment for everyone. Your surgeon will talk with you about what surgery they will do and why.

What will my doctors learn from the grid sensor?

The goal of placing the grid sensor is to find out where your seizures start. Here are next steps, depending on what your doctors learn:

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- **If your seizures come from a small area of your brain that does NOT control language or movement:** Your surgeon will remove the grid sensor, and also do epilepsy surgery to remove the brain tissue where your seizures start.
- **If your seizures come from an area of your brain that controls your language or movement:** We will **NOT** advise epilepsy surgery, since the risks outweigh the benefits. Your surgeon will simply remove the grid sensor.
- **If your seizures come from many areas in the brain, or we cannot tell where they begin:** We usually do **NOT** advise epilepsy surgery, unless it is a *palliative* surgery with the understanding it may decrease but not stop your seizures. Your surgeon will remove the grid sensor, and also do epilepsy surgery if it is advised.
- **If your seizures come from only the *hippocampus,* a small area deep in the brain:** Your doctor may advise you to have *laser ablation* surgery. Your surgeon will remove the grid sensor, and plan for a laser ablation surgery at a later date.

When can I leave the hospital?

You will go home when you have recovered from surgery and are able to take care of yourself.

What follow-up care will I receive?

Plan for a follow-up visit within 10 to 14 days after going home. **This visit is very important.** At this visit, your provider will make sure your incisions are healing well . They will also remove the sutures (stitches) or surgical staples.

- If you live in the Seattle area, set up your follow-up visit at the Regional Epilepsy Center.
- If you live outside of the Seattle area, set up your follow-up visit with your primary care provider or primary neurologist.

Questions?

Your questions are important. Call your doctor or healthcare provider if you have questions or concerns.

Regional Epilepsy Center: 206.744.3576

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