

NBS

What is NBS?

Your Guide to Navigated Brain Stimulation

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NBS means navigated brain stimulation, and is used to precisely map the areas controlling muscle movements/activity in the brain. This procedure provides advanced patient care while avoiding invasive testing that used to be done in an operating room.

The procedure creates an accurate and detailed map of the critical functions of the cortex using a standard MRI brain scan. This is done by using neuronavigated transcranial magnetic stimulation (TMS) that is similar to mapping the globe with a GPS.

NBS uses stereotactic MRI-guided transcranial magnetic stimulation (TMS) to non-invasively excite precise areas of the cortex. The sophisticated, real-time data provides unsurpassed accuracy and control of the electric field (E-field) inside the brain. The procedure uses integrated EMG monitoring to instantly show the responses. NBS results are presented as detailed color maps of the critical eloquent areas visualized in a 3-D rendering of the brain. This allows the physician to determine which areas of the brain are “good”, and accurately determine functional tissue.

Historically, the only way to duplicate these detailed maps was through a craniotomy. However, now NBS performs cortical mapping in a comfortable setting for the patient, prior to surgery. The 3-D cortical maps created through this procedure, helps to plan and visualize surgical strategies and give additional information to help patient and physician discuss treatment options and outcomes.





How it Works:

The procedure allows your doctor to study your brain using transcranial magnetic stimulation (TMS). TMS uses a magnetic coil “wand” which will be touching your head. It then produces magnetic energy outside your head to create a weak electrical current in your brain, which will be used to stimulate neurons (cells in the nervous system that process and transmit information) inside your head. This is done in the same way that you produce a weak electrical current in your brain when you voluntarily make a muscle move. The stimulation passes through the scalp and skull safely and painlessly.

The TMS is used to stimulate your brain to move different muscles in your hands, arms and legs. When the neurons are stimulated, they then tell the muscles to move. Part of the procedure is to determine how much stimulation you need to move these muscles (called a Motor Threshold (MT)). These values are recorded and saved in the computer to accurately determine the level of TMS needed for an accurate response.

As the stimulation is applied and your muscles move, your brain function will be “mapped” on the computer. This will allow you to see on the computer the picture of what areas of your brain cause different muscles to move. This information can then be used by your doctor to determine how to best treat you.

What are the Benefits of NBS?

- Is completely non-invasive
- Provides a more informed approach to surgery/treatment thus lowering a risk of damage to the motor cortex
- Helps to avoid having to face invasive diagnostic testing
- Saves time in the operating room

Who does this procedure benefit?

Patients facing the following may benefit from this non-invasive brain mapping procedure:



Brain Tumor (Neurosurgery: Tumor Resection)

The purpose of the brain mapping procedure is to use TMS to identify “healthy” or functional tissue in the brain before surgery.

This may result in decreased time in the operating room, smaller incision, and more accurate removal of tumor.

Stroke Recovery Patients (Motor Tract Integrity Monitoring)

The purpose of the brain mapping procedure is to use TMS to identify whether there are nerve connections between the surface of your brain and the muscles which have been weakened due to the stroke.

By determining how well the signals are transferred to the affected muscles, the physician can assess therapy options.

Risks

Regarded as a safe procedure, the greatest potential risk of TMS is the rare occurrence of induced seizures. However, to date there have been no reported TMS-related seizures associated with the Nexstim NBS system.

Other risks include headache, discomfort in sitting for 0.5 – 1 hour, and discomfort in the clicking sound created when the system produces the stimulation.

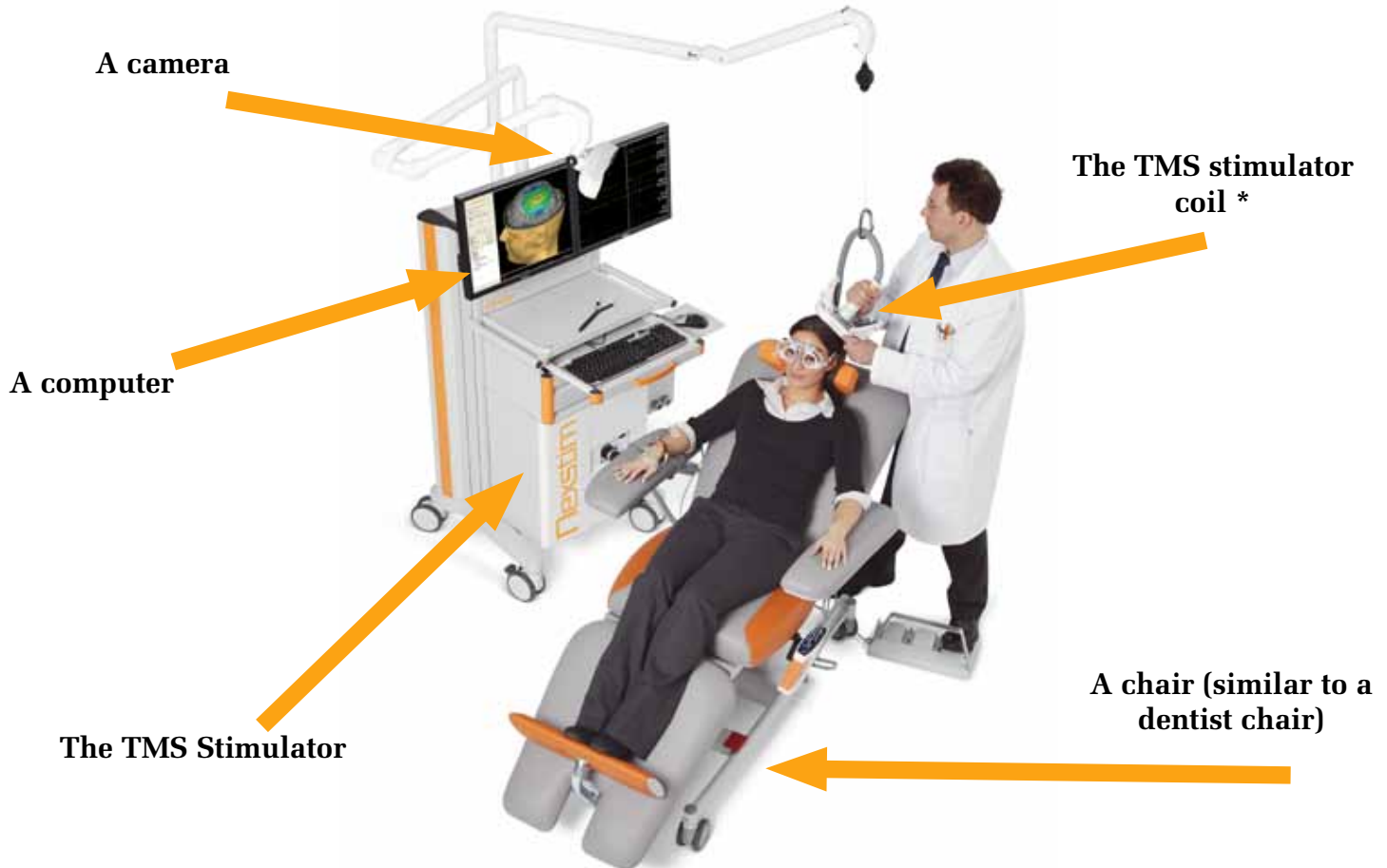
Note: The majority of all patients treated with the Nexstim’s Navigated Brain Stimulation report little to no discomfort. In fact, many subjects have been known to fall asleep during the procedure.

Please tell your provider if you have an implanted device of any kind, such as a vagus nerve stimulator or cochlear implant.

What to Expect:

Once you have had a standard MRI brain scan, the image will be loaded into the NBS system.

When you enter the room it will consist of:



Note: The camera does not take any pictures of you; it is called a stereotactic camera used to monitor the location and position of your head relative to the position of the TMS wand. This is needed to guide the TMS to different areas of your brain.

During the stimulation you will be sitting comfortably in the chair. You will have surface electrodes (gel circles that “stick” to your skin) on the muscles that are being stimulated. These electrodes measure the strength of activity in your muscles. It is called electromyography (EMG). The electrodes are not invasive (no needles). You will also wear “glasses or goggles.” They are not prescription glasses, they don’t have glass (the eye holes are open). They do have ‘silver reflector balls’ which allow the camera to determine the location and position of your head.

The TMS device makes a clicking sound; you can use soft foam earplugs during the test if the sound is uncomfortable. As the stimulation is taking place, it often feels like a soft tap on your head. Most patients feel little to no discomfort; in fact they often will fall asleep during the procedure, as there is no patient effort required. The patient will just sit comfortably in the reclining chair and wear the glasses.

The brain mapping procedure generally takes about 0.5-1 hour.

***Approximately the size of a hand. This is the coil that looks like a wand which will be touching your head**