

MEG EXAMINATIONS

Sensory mapping helps neurologists and neurosurgeons to:

- estimate the location of brain lesions in relation to the brain's sensory and motor centers
- assess the possibility of postoperative deficits
- determine the safest surgical approach to the lesion
- minimize the size of craniotomy
- minimize intraoperative electrical brain recording and stimulation

Epilepsy source localization helps neurologists and neurosurgeons to:

- determine whether the sources of epileptic activity can be safely removed surgically
- decide whether a patient will need to undergo invasive monitoring
- plan the safest surgical approach to the epileptic brain tissue
- plan the best placement of invasive electrodes, if required



For more information and to schedule an appointment contact the Neuromagnetism Laboratory:

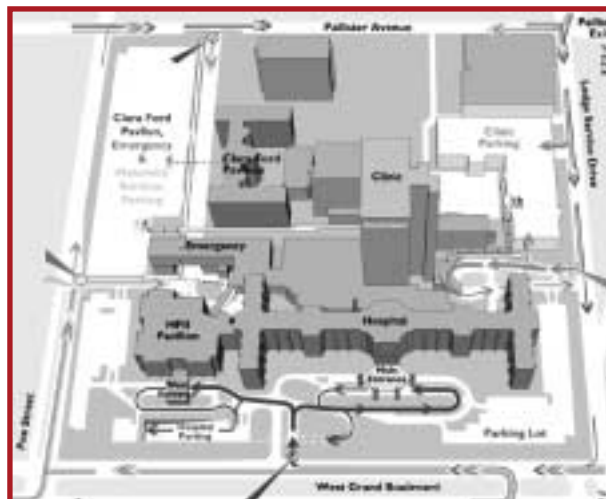
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What is Magnetoencephalography?

Magnetoencephalography (MEG) is a safe, non-invasive and painless procedure that provides information about how a patient's brain functions. MEG can detect small biomagnetic signals produced by the brain, either spontaneously or in response to stimulation, and provide data about the locations of brain tissue that produce these signals. These locations are mapped onto the patient's MRI scan to show the regions of active brain tissue in relation to potential surgical targets. This process of overlaying MEG data onto the MRI scan is called magnetic source imaging (MSI). Neurologists and neurosurgeons use this information to evaluate a patient's surgical risks and develop strategies to minimize those risks. The two most common MEG procedures are sensory mapping and localization of epileptic activity.

MEG Sensory Mapping

This procedure usually takes less than two hours and is used for patients being evaluated for brain surgery such as to remove a tumor or an arteriovenous malformation (AVM). For somatosensory mapping, pulses of air are used to stimulate the patient's fingers, face, and toes while the MEG probe detects the biomagnetic fields produced by the patient's brain in response to these sensations. The measurements obtained from this test are used to locate the precise regions of the brain responding to the stimuli. These MEG locations are mapped onto the patient's MRI scan to provide details about the position of the active brain tissue in relation to the position of the tumor or AVM. This helps neurosurgeons to plan the best surgical route to minimize com-

plications and to achieve the best possible outcome for each patient. Similar techniques can be used to locate the brain centers for hearing and vision.

MEG Epilepsy Source Localization

This procedure usually takes three to four hours and is used for patients being evaluated for epilepsy surgery. For this test the patient rests on the bed of the MEG system while the system records the brain's spontaneous biomagnetic fields. Electroencephalography (EEG) recordings are made at the same time. MEG recordings are analyzed to find waves (called "spikes") which are believed to arise in the same part of the brain that produces the patient's seizures. The spike maps are overlaid onto the patient's MRI scan. This helps neurologists and neurosurgeons to determine if the epileptic activity is concentrated in one or more brain regions and whether the patient is a suitable candidate for surgery.

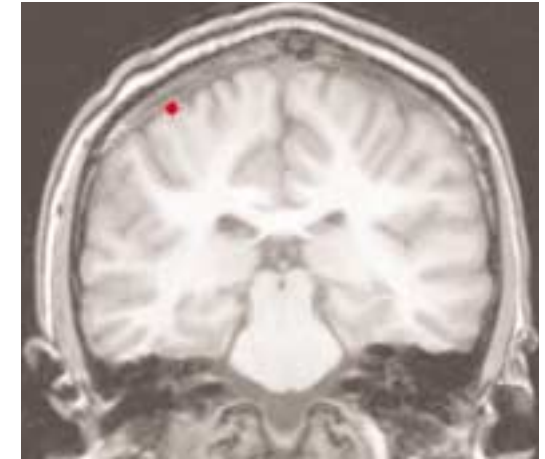
What are the Risks?

There are no known risks associated with MEG. This procedure does not subject the patient to a magnetic field and thus can be performed safely on patients with a pacemaker or metallic implant, although these devices may limit the accuracy of the procedure.

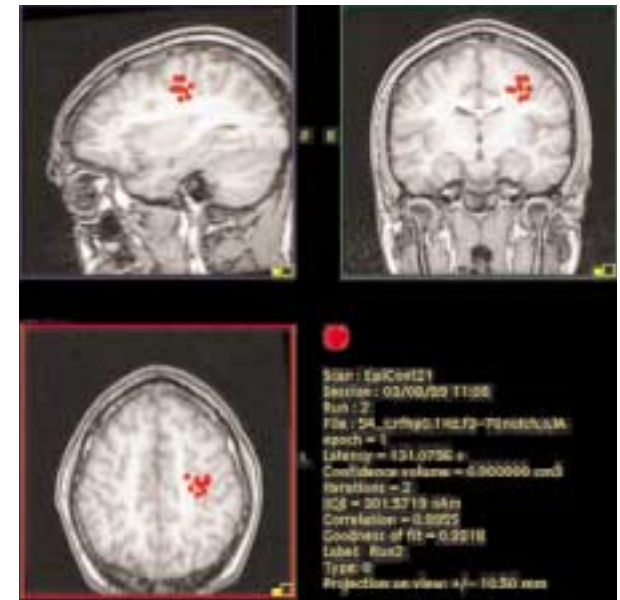
Insurance Reimbursement

Payers are realizing the significance of preoperative somatosensory and epilepsy mapping using MEG. As a result, they are approving claims for reimbursement. Pre-qualifications for reimbursement will be obtained by Henry Ford Neuromagnetism staff when required.

MEG CASE STUDIES



Somatosensory map of left fifth finger stimulation



Epilepsy source localization