

Mapping of the motor cortex and speech areas (Navigated transcranial magnetic stimulation, nTMS)

Purpose of the Examination

The purpose of the examination is to map your motor cortex or speech areas before surgery. Transcranial magnetic stimulation (TMS) is a safe and a widely-used examination method, in which the brain is stimulated using an alternating magnetic field given to the scalp. You will undergo an EEG examination after staying awake and an MRI scan of the brain before the examination, for which you will receive separate instructions.

Preparing for the Examination

- You should have clean and dry hair when coming to the examination. Do not use body lotion or skin oil before the examination.
- Bring along information about any medication you are taking. If you have a pain killer, that you use as needed, you can take it with you to the treatment session.

Examination Process

You will rest on a chair during the examination. The physician will give magnetic stimuli to the surface of your head, where the motor cortex or speech areas are located, using a magnetic coil. In mapping of the motor cortex, the potentials caused by muscle contractions are simultaneously measured with sensors attached on different facial, upper and lower extremity muscles. In the mapping of speech areas, magnetic stimuli are given to brain areas at the same time as you perform naming tasks.

If you have an inner ear prosthesis, an infusion pump, a pacemaker or a prosthetic valve in your heart, or metallic parts in your head (e.g. surgical clips, metallic fragments) that are impossible to remove, the examination might not be performed on you. Amalgam fillings, dental implants or braces do not prevent the treatment. If you are pregnant or if you have experienced epileptic seizures, please inform the physician before the examination. You will be asked about possible reasons not to perform the examination before beginning.

We kindly ask you to shut down your mobile phone for the duration of the treatment. You are also asked to remove objects containing metal or magnetic stripes (e.g. jewellery, credit cards, keys & coins) from your pockets and around your head.

Examination Duration and Sensations

The examination visit lasts for about an hour to two hours.

The magnetic stimuli used during the examination may feel slightly unpleasant because of the brief contraction of the muscles and the activation of sensory nerves in your head. Some patients may experience brief headache or sensitivity near the examination area.