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NHS
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Department of Clinical Neurophysiology

Spinal Cord Monitoring During Back Surgery

This leaflet is designed to give you some information about the **spinal cord monitoring** your surgeon has asked us to perform during your spinal surgery.

During your operation we monitor the tiny electrical signals along the spinal cord by recording evoked potentials. This monitoring helps reduce the risks of spinal cord damage during the surgery but cannot eliminate these risks entirely. You still need to take into consideration all the risks of the surgery as discussed with your surgeon.

Before the operation

We normally perform a **sensory evoked potential (SEP)** before your operation to make sure you have responses we can monitor. If possible, this is performed before your operation, and we will send you an outpatient appointment to arrange this.

Pre-operative SEP
How is it done?

The pre-operative check takes around 30-45 minutes.
We will attach small disc electrodes to your head using a sticky paste to record the SEP response from your brain. Small pieces of sticky paste will be left in your hair - these will wash out with shampoo.

To obtain the response a nerve at your ankle is stimulated. This causes an unusual prickling sensation and small twitches of your foot. It can be uncomfortable but should not be painful and is well tolerated by most people. There are no aftereffects.

Please be prepared to take off your shoes and socks/ tights/ stockings and trousers for the pre-operative SEP. We may also draw some removable pen marks on your skin over leg muscles and stimulation points as appropriate for your operation.

The day of your operation

Please ensure your hair is clean and dry as we will be putting recording electrodes on to your head for the surgery (we will do this once you are asleep under anaesthetic). If you have long hair, it is useful if you loosely plait your hair (2 plaits are best but please leave your hair loose on top).

During the operation

The following gives an outline of the spinal cord monitoring; however, you will not be aware of these occurring as you will be asleep under anaesthetic.

- **SEPs** (Sensory Evoked Potentials) check the nerve pathways from the leg and arm through the spinal cord to the brain. A stimulator is used to stimulate a nerve in the foot /hand and recordings are made at the knee/elbow, neck and head using small disc electrodes attached to the skin and small needle electrodes placed under the skin.

- **MEPs** (Motor Evoked Potentials) check the pathways from the brain to selected muscles in your legs, feet and hands. We do this by stimulating part of the brain with electrical pulses through small needles placed just under the skin on the head and recording with needles placed under the skin near certain muscles in your legs, feet and hands.
- The SEP/MEPs are performed at short intervals throughout the surgery. Any significant changes to the SEP/MEP are reported to the surgeon and anaesthetist because these changes can predict the risk of spinal cord injury.
- **Pedicle screw/tract testing** is performed if requested by your surgeon. This is an additional test in which we can electrically stimulate the pedicle screw (spine screw) and check for any leg muscle twitches. This test is an additional tool used to guide the surgeon placing the screw.

Are there any additional risks during surgery with the monitoring?

- There is a very small risk (1 in 500) of a seizure occurring when doing the MEP test. If you have poorly controlled epilepsy this may involve a slightly higher risk and we will need to evaluate on an individual basis if we should do MEPs in your case.
- The anaesthetist will insert a soft bite guard in your mouth to minimise the chance of jaw/ mouth injury as there is a chance of this occurring during the MEP test.
- Some minor bruising at the sites of the needle electrodes can occur. There are a few isolated reports in the UK of small patches of hair loss associated with use of the scalp needle electrodes.
- SEPs are considered safe with no additional risks or side effects. SEP monitoring alone will not directly check the motor pathways of spinal cord, so MEPs are also used for spinal cord monitoring when not otherwise contraindicated.

After the operation

All the electrodes will be removed before you wake up. You may notice a small amount of blood/ marks at the sites where the needle electrodes had been removed.

Any questions?

If you have any questions or concerns about the monitoring, please do not hesitate to contact our staff on **01603 287306** before your appointment or talk to us before the start of your test. The department is open **Monday-Friday 8am-4-30pm**. There is a voicemail service to leave a message if we are unavailable.

Please fill out and sign the attached screening form and send it back to is in the Department of Clinical Neurophysiology as soon as possible. This will help us plan your monitoring before the surgery.

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