

Spinal cord monitoring during surgery: information for families

During certain orthopaedic and neurosurgery spinal operations, we may be asked to monitor your child's spinal cord to reduce the risk of nerve damage during surgery. This information sheet from Great Ormond Street Hospital (GOSH) explains the procedure for spinal cord monitoring which your surgeon has asked us to perform during your child's surgery. An Easy Read information sheet is included for your child.

You should be aware that we cannot eliminate these risks entirely. Your surgeon will explain the risks and benefits of spinal cord monitoring before the operation, you can discuss any worries you might have.

The monitoring involves sending small electrical signals up and down the spinal cord throughout surgery to ensure it responds properly. The responses that we obtain are called 'evoked potentials' and these signals can be recorded through the scalp and muscles using special techniques.

The day of the operation

When your child is under anaesthetic, a Clinical Physiologist (CP) will place small stimulating and recording needle electrodes in the arms, legs and scalp. Your child will be asleep throughout and will not feel this. The needles we use are sterile, for single use only and will be disposed of safely after the surgery.

Asking for your consent

Your surgeon will ask permission for the surgery and spinal cord monitoring procedure before the

operation. They will explain the risks and benefits and you will have the opportunity to ask any questions during this meeting. They will then ask you to sign a consent form.

What does the test involve?

There are two main types of evoked potential that we monitor during orthopaedic and neurosurgery spinal surgery:

Somatosensory Evoked Potentials (SSEP) test the nerve pathways from the arms and legs to the sensory part of the brain, through the spine. We test these signals throughout the surgery. If there are any significant changes to the responses we inform the surgeon and our neurophysiology doctors.

Motor Evoked Potentials (MEP) test the nerve pathways from the brain to certain major muscles in the arms or legs. We do this by stimulating a part of the brain with electrical pulses through the scalp and record responses from certain muscles in the arms and legs. We test these signals at short intervals throughout the surgery. If there are any significant changes to the responses we



inform the surgeon and our neurophysiology doctors.

In the anaesthetic room, when your child is under anaesthetic, the CP will measure your child's head and mark points using a soft pencil, they will then clean your child's head using a sterile cleaning swab and place small needle electrodes just under the scalp. Additional needle electrodes will be applied to certain muscles in the arms and legs.

When all the electrodes are placed, we will collect SSEP and MEP responses before surgery starts – this gives us a baseline so we can compare the measurements we take during the operation. We continue to collect these responses at short intervals during the operation to monitor the spinal pathway.

After the operation

All the electrodes will be removed before your child wakes up from the surgery.

Are there any risks?

There may be some minor bruising where we have inserted the electrodes. These should disappear within a week. If there are any concerns please speak to the clinical team looking after your child.

The muscle contractions during stimulation may cause a bite injury to the lip or tongue. In all spinal cord monitoring cases, a mouth guard is placed by the anaesthetist to reduce the risk of this injury.

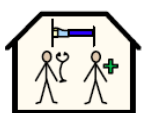
If your child has an implanted device (such as a pacemaker or brain shunt) the electrical stimulation may interfere with its function. However, your clinical team will be aware of this and will ensure that the device is checked following surgery. During the surgery, your child's vital functions will be monitored throughout.

Please inform your surgeon or anaesthetist if your child has epilepsy or has had seizures in the past. The brain stimulation for MEP monitoring can trigger a seizure (even if your child does not have epilepsy). However, this is very rare, affecting less than one per cent of children having spinal cord monitoring.

Getting the results

We work closely with the surgeon and neurophysiology doctors during the operation and alert them to any changes in the responses obtained. Following the operation, a detailed report of the spinal monitoring results will be written and sent to your child's surgeon.

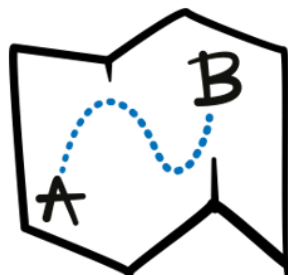
Having spinal cord monitoring during an operation



You are coming to hospital for an operation. During the operation, we also look at your brain, nerves and muscles to help the surgeon with the surgery.



Your brain works using signals. When the brain is made to react to something, the signals change. The SSEP test records these changes.





Your nerves and muscles work using signals from the brain. When the brain makes these signals, it will make the nerves and muscles react. The MEP test records these changes.



When you are asleep, we will clean small areas of your head, arms and legs. You will not feel this.



Next we will put some small sensors where we have cleaned on your head, arms and legs. We use stickers to hold them in place. You will not feel this.



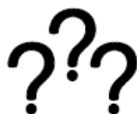
We will join the stickers to the computer with wires. You will not feel this.



When operation is finished, we will take off the stickers and sensors when you are asleep. You will not feel this.



You will go back to the ward where the doctors and nurses will look after you until you feel better.



Please ask us if you have any questions.

