Neurophysiology Department
Brain mapping and monitoring during surgery Leaflet

Your Surgeon would like you to have Neurophysiology mapping / monitoring during your surgery. The most common type of brain mapping is motor mapping using motor evoked potentials (MEPs) to map out the regions of your brain that control your muscles. Other types of mapping include somatosensory mapping to locate your sensory part of the brain and visual evoked potential mapping to map out the area of your brain responsible for vision. The type of mapping will depend upon the location of your surgery.

What are Motor Evoked Potentials (MEPs)?
MEPs are responses recorded from your muscles when your brain is stimulated. Once you are asleep and ready for surgery small needle electrodes are placed in different muscles in your face, hand, leg and foot. During brain surgery stimulating electrodes are placed directly onto your brain and a small needle electrode is placed in your scalp (forehead).

What is MEP mapping?
During brain surgery the Surgeon will stimulate your brain in different locations when they stimulate the region of the brain that controls your hand a response will be recorded from the electrodes placed in your hand muscles. By recording from different muscles the Surgeon can identify the parts of your brain that control these muscles.

What is MEP monitoring?
Repeated MEPs allows the Surgeon to monitor brain motor function during brain surgery. Changes in MEPs are used to predict the risk of weakness after surgery and if it is likely to be permanent or temporary. Feedback to the Surgeon may help protect your brain from permanent motor injury, weakness or paralysis. During certain types of brain surgery MEPs can be used to monitor for stroke.

After Surgery
You may have small sore areas where the needle electrodes have been placed in your muscles and scalp. All electrodes are removed before you wake up.
Are there any risks to MEPs?
Neurophysiological mapping and monitoring is considered safe; the most serious safety concern is seizure this is considered rare using the stimulus techniques required for brain MEP mapping and monitoring. No reports of seizures resulting from MEP monitoring in anesthetized patients have been published to date. There are unpublished observations by Deletis and MacDonald of rare seizure occurrences. The placement of needle electrodes in a sterile manor for stimulation and recording have never been associated with inflammation or severe bleeding or more serious complications.

Are there any alternative monitoring techniques?
The alternative technique to MEP monitoring is to perform the surgery with you awake and you are continually asked to move your arms and legs by the Surgeon. Functional MRI mapping or transcranial magnetic stimulation mapping can be undertaken prior to surgery and used to guide surgery, this is not a live image of your brain.

What if I don’t have MEP mapping or monitoring?
During brain surgery the Surgeon won’t be able to map or monitor your brain for motor function increasing the risk of permanent motor weakness, dysfunction or paralysis and won’t be able to monitor for stroke.

What are Somatosensory Evoked Potentials (SSEPs)?
SSEPs are responses that are recorded from the brain when nerves in the hands or feet are stimulated. Needle or corkscrew electrodes are placed in your scalp or an electrode is placed directly onto your brain while you are asleep and stimulating electrodes placed at the wrist and ankle.

What is SSEP mapping?
During brain surgery the nerves in the hand or foot are stimulated and responses recorded directly from the brain and used to identify the hand or foot sensory area of your brain.

After Surgery
You may have small sore areas where the needle electrodes have been placed in your scalp. All electrodes are removed before you wake up.

Are there any risks to SSEPs?
SSEPs are considered safe with no reported risks or side effects from SSEPs.

Are there any alternative mapping techniques?
Functional MRI mapping can be undertaken prior to surgery and used to guide surgery, this is not a live image of your brain.

What if I don’t have SSEP mapping?
The Surgeon won’t be able to map out the sensory function of your brain during surgery.
What are Visual Evoked Potentials (VEPs)?
VEPs are responses recorded from the back part of your brain when your eyes are stimulated with a flashing light. Needle or corkscrew electrodes are placed in your scalp or an electrode is placed directly onto your brain while you are asleep, flashing light stimulators are attached to your eye lids during surgery.

What is VEP mapping?
An electrode is placed at different locations and VEP responses recorded, these are used to map out the visual areas of your brain. This type of mapping is only undertaken when surgery is located at the back of your brain.

What is VEP monitoring?
VEPs can be performed multiple times to monitor your vision during surgery this is used to reduce the risk of vision loss. This type of mapping is only undertaken when surgery is located at the back of your brain.

After Surgery
You may have small sore areas where the needle electrodes have been placed in your scalp. All electrodes are removed before you wake up.

Are there any risks to VEP mapping/monitoring?
VEPs are considered safe with no reported risks or side effects from VEPs.

Are there any alternative mapping / monitoring techniques?
Functional MRI mapping can be undertaken prior to surgery and used to guide surgery, this is not a live image of your brain.

What if I don’t have VEP mapping or monitoring?
The Surgeon won’t be able to map out visual function on your brain during surgery and without VEP monitoring the risk of loss of vision after surgery is increased.

What type of brain surgery requires MEP / SSEP / VEP mapping / monitoring?
- Epilepsy surgery
- Brain tumour surgery
- AVM surgery

If you have any questions (before or after your Surgery) please ring 0151 529 5602

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Gellir gofyn am gael cyfeithiad o’r deunydd hwn neu gellir trefnu cyfieithydd ar y pryd os yw hynny’n well gennych. I wybod rhagor am y gwasanaethau hyn cysylltwch à chanolfan Walton ar 0151 525 3611.

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*Title:* Motor Evoked Potential (MEP) mapping and monitoring  
*Author:* Michael Pridgeon Neurophysiology Department  
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