

# Awake Craniotomy with Intra-operative Functional Mapping (IOFM)



Irving Building  
Neuropsychology  
0161 206 4694



Health & care  
information  
you can trust

The Information Standard

Certified  
Member

This booklet has been designed to introduce patients to what is involved in awake brain surgery and mapping of brain areas involved in sensory, motor and language skills.

If you have any questions after reading this information in this booklet please do not hesitate to contact the

**Neurosurgeon on:**

*or your*

**Neuropsychologist on:**

## The Awake Craniotomy Team

**A Neurosurgeon** will oversee your individual patient pathway. He / she will explain to you and your family the proposed plan for surgery. It is the neurosurgeon who will perform the surgery to remove the brain tumour and carry out electro-stimulation of brain areas to map your motor and thinking skills during the surgery. The same neurosurgeon will then follow you up following surgery.

**A Neuropsychologist** will complete pre and post-surgical assessments of your thinking skills and quality of life.

The neuropsychologist will also complete an fMRI scan with you and analyse the fMRI data.

The neuropsychologist will be with you during the surgery and will assess your motor and thinking skills whilst the neurosurgeon carries out electro-stimulation of brain areas. The same Neuropsychologist will follow you up following surgery.

**A Neuroanesthetist** familiar with specialist awake craniotomy techniques will be responsible for your comfort and safety during the procedure.

**A Neuroradiologist** may be involved in the acquisition and analysis of the fMRI data.

**Neuro-Oncology Clinical Nurse Specialist's** act as key workers throughout the patient pathway.

**The Neuro-oncology Multi-Disciplinary Team** (specialist nurses, clinical oncologists, neuropathologists, neuroradiologists, neurologist and other professionals allied to medicine) support the patient pathway including confirmation of a brain tumour diagnosis and ongoing treatment of patients with brain tumour.

## What will happen before your surgery?

### Pre-surgical Assessment

A **Neurosurgical Consultation** will take place prior to your surgery. During this visit your neurosurgeon will explain your proposed treatment plan and answer any questions regarding the procedure.

A pre-operative **Anaesthetic Assessment** will take place to assess your physical fitness for the procedure.

You will have a **Pre-operative brain scan** before your surgery (Brain Lab scan) which will be used as a navigational tool to guide us to the exact area of your tumour.

**Neuropsychological Consultation:** Before your surgery a clinical neuropsychology assessment will be completed to identify any changes you may be experiencing relating to the brain tumour.

This includes a formal assessment of thinking skills through 'paper and pen' tasks, for example, speech. Neuropsychological assessment helps to identify strengths and weaknesses in your thinking skills and how these relate to the brain tumour. This informs the surgical team about any potential risks that surgery may have to thinking skills.

**This information may help you to make a fully informed decision about your surgery.**

## Functional MRI

You will complete a specialised brain scan, an fMRI (functional Magnetic Resonance Imaging). fMRI can identify brain areas that are involved in motor and/or language skills. fMRI provides information about where areas involved in movement and speech are located in your brain and how close these vital areas are to the brain tumour.

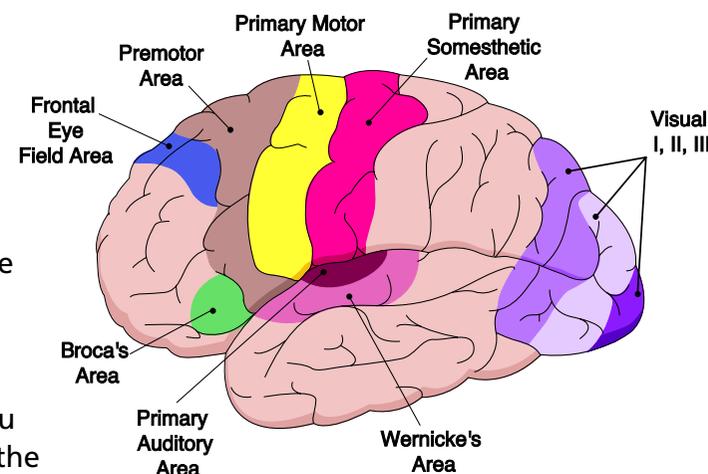
fMRI confirms the side of your brain responsible for language. fMRI can assist the neurosurgeon to judge how much of the brain tumour may be safely removed and decide the best approach to the surgery. You will complete the fMRI scan with the Neuropsychologist.

You will also meet the Neuropsychologist the week of your surgery to familiarise you with the tasks you will be doing during the surgery and to prepare you for the awake surgery.

This includes any emotional support you may need before, during and following your surgery.

## Awake Craniotomy with Intra-Operative Functional Mapping (IOFM)

Awake craniotomy (awake brain surgery) with functional brain mapping is a multi-disciplinary approach to brain surgery for the treatment of brain tumour.



## Awake Craniotomy: What does it involve?

Intra-operative functional mapping (IOFM) allows the Neurosurgeon to identify essential brain areas for language and movement during the surgery. This ensures that as much of the brain tumour is removed as possible whilst protecting your speech and movement and quality of life following surgery.

'Awake craniotomy' is a misleading term as you may not be awake for the entire procedure. The Neuroanaesthetist looking after you will administer either a general anaesthetic or sedation, in combination with a local anaesthetic injections to the scalp for the first part of the surgery. This is when the Neurosurgeon removes the bone flap in order to get access to the brain.

You will be gently woken up during the tumour resection stage during which we will need your co-operation. The brain itself has no pain receptors, so you will not feel any pain. However, you will not be able to move your head as this would have been fixed to a frame earlier and you will not be

able to see the surgery behind you. You will be able to see and speak to the Neuroanaesthetist and Neuropsychologist at all times.

During brain mapping (IOFM) the surgeon will apply an electric stimulation to the brain to temporarily stop function in that area. At the same time the Neuropsychologist will assess your movement and language skills to identify areas of the brain that need to be avoided during the tumour resection.

Awake speech mapping involves applying mild electrical current to the surface of the exposed brain while you will be asked to complete different tasks, such as reading, moving your hand or leg, counting 1-10 etc. If the stimulation interrupts the task, then that area of the brain is marked and will not be taken out.

When as much of the tumour as possible has been removed, you will either be sedated or given a general anaesthetic for the final stage of the surgery when the surgeon replaces the bone flap and closes up.

## What will happen after surgery?

You will be reviewed following surgery by your:

**Consultant Neurosurgeon:**

**Clinical Neuropsychologist:**

**Neuro Oncology Clinical Nurse Specialist:**

Following your surgery you might need some further treatment including radiotherapy or chemotherapy depending on the type and grade of your tumour.

### Risks

Although the risks of this procedure are much less than if you were fully asleep, it is still brain surgery with its associated risks, i.e. infection, haemorrhage, stroke, seizures, risk of medical complications and small risk to life.

A proportion of patients experience temporary changes in their speech and language skills following surgery. This may last for a few days, but for some

patients can continue for a few months following surgery. This will be discussed with you in more detail during your pre-operative neuropsychology consultation.

### Summary

In summary, our aim is to remove as much of your tumour as is safely possible. There is increasing evidence that undergoing awake craniotomy with functional mapping increases the chance of improving and controlling your symptoms (especially seizures), whilst also achieving longer tumour control and improving long-term prognosis.

### Useful Links, Associations & Contacts

**Brain Tumour UK**

[www.braintumouruk.org.uk](http://www.braintumouruk.org.uk)

**Samantha Dickinson Brain Tumour Trust**

[www.braintumourtrust.co.uk](http://www.braintumourtrust.co.uk)

**BASIC (Brain and Spinal Injury Charity)**

[www.basiccharity.org.uk](http://www.basiccharity.org.uk)

**Epilepsy Action**

[www.epilepsy.org.uk/info/nonep.html](http://www.epilepsy.org.uk/info/nonep.html)

**National Society for Epilepsy**

[www.epilepsynse.org.uk/pages/info/leaflets/factsnea.cfm](http://www.epilepsynse.org.uk/pages/info/leaflets/factsnea.cfm)

**Neuro Oncology Clinical Nurse Specialist's** at Salford Royal NHS Foundation Trust, Stott Lane, Salford.

**0161 206 2073 or 0161 206 0613**

© G16110911W. Design Services  
Salford Royal NHS Foundation Trust  
All Rights Reserved 2017  
This document **MUST NOT** be photocopied

**Information Leaflet Control Policy:**

Unique Identifier: NOE 56 (16)

Review Date: February 2019

For further information on this leaflet, it's references and sources used, please contact **0161 206 4694**.

Copies of this information are available in other languages and formats upon request.

In accordance with the Equality Act we will make 'reasonable adjustments' to enable individuals with disabilities, to access this treatment / service.

**If you need this interpreting please telephone**

Polish

Jeżeli potrzebne jest Państwu tłumaczenie, proszę zadzwonić pod numer.

Urdu

اگر آپ کو اس ترجمانی کی ضرورت ہے تو مہربانی کر کے فون کریں۔

Arabic

إذا كنتم بحاجة الى تفسير او ترجمة هذا الرجاء الاتصال

Chinese

如果需要翻译，请拨打电话

Farsi

اگر به ترجمه این نیاز دارید ، لطفاً تلفن کنید

**0161 206 0224**

Email: [InterpretationandTrans@srft.nhs.uk](mailto:InterpretationandTrans@srft.nhs.uk)

Under the Human Tissue Act 2004, consent will not be required from living patients from whom tissue has been taken for diagnosis or testing to use any left over tissue for the following purposes: clinical audit, education or training relating to human health, performance assessment, public health monitoring and quality assurance.

If you object to your tissue being used for any of the above purposes, please inform a member of staff immediately.

**Salford Royal operates a smoke-free policy.**

For advice on stopping smoking contact the Hospital Specialist Stop Smoking Service on 0161 206 1779

Salford Royal NHS Foundation Trust  
Stott Lane, Salford,  
Manchester,  
M6 8HD  
**Telephone 0161 789 7373**  
[www.srft.nhs.uk](http://www.srft.nhs.uk)

If you would like to become a Foundation Trust Member please visit:  
[www.srft.nhs.uk/for-members](http://www.srft.nhs.uk/for-members)

If you have any suggestions as to how this document could be improved in the future then please visit:  
<http://www.srft.nhs.uk/for-patients>