



This leaflet aims to answer your questions about having a functional MRI (fMRI) scan. It explains the benefits, risks and alternatives, and what you can expect when you come to the department. If you have any further questions, please speak to the Radiographer caring for you.

## What is fMRI?

Functional magnetic resonance imaging (fMRI) is a scanning technique that measures and maps the small changes in blood flow that occur with brain activity.

fMRI uses the same technology as MRI and is extremely useful when neurosurgeons prepare for brain surgery, allowing them to identify critical areas of the brain used for key functions such as language, speech and movement. This means that the operation can be planned to preserve as much of these areas as possible. fMRI is a non-invasive and pain-free test used to make brain surgery safer and more successful.

## How does fMRI map brain activity?

fMRI looks at blood flow in the brain to detect areas of activity. The brain's primary source of energy is glucose. However, glucose is not stored in the brain. Therefore, when parts of the brain need energy to perform specific tasks, more oxygen-rich blood flows to transport the glucose to the active areas. For example, when you are speaking, there is an increase in oxygen-rich blood flowing to the area of the brain designated to speaking.

In fMRI, brain activity is mapped in squares called voxels and colour is added. It is then overlapped onto the regular MRI images to produce a map of the brain.

## What happens during an fMRI scan?

An fMRI is very similar to a regular MRI scan.

You will first be asked to lie down on a motorised bed, which we will use to position you for your scan. We will then provide you with some earplugs and headphones which protect your ears from the loud noises you will hear during your scan. These noises are perfectly normal and a sign that the scanner is working well. In addition, the headphones will allow us to speak to you during your scan. We will also give you an emergency button to hold, which you can use to summon us if you experience any problems during your scan.

You will need to lie very still during the scan to avoid blurring the images, so we will provide you with cushions, pads and a blanket to make sure you are as comfortable as possible.

In a fMRI scan, you will be asked to perform one or more tasks during the imaging process. This may include a combination of tasks such as tapping your fingers, pursing your lips, viewing pictures on a screen or playing word games. The activities related to these tasks will cause increased blood flow to areas of the brain responsible for these tasks, which can then be recorded as MRI images.

In addition, routine MRI images of the brain will also be performed.

During the examination, the Radiographer will be in constant touch to ensure that you understand precisely what you need to do to complete the task.



## How long will it take?

This depends on the type and number of tasks we need to perform to address the specific questions that your surgeon has asked us. On average, an fMRI scan will take around an hour, with around 20-30 minutes of that time requiring your participation with tasks.

Typically, we would advise you to plan to be in the department for around an hour and a half.

## Why should I have an fMRI scan?

An fMRI scan can help your surgeon decide on the safest and most effective surgical approach for you. Your doctor will have performed an analysis of the risks and the benefits of having the scan before referring you.

## What if I am claustrophobic?

If you are claustrophobic, we recommend you contact us to discuss your concerns. Our wide-bore MRI scanner is typically considered more comfortable than most other scanners, and we will be happy to talk to you more about this.

You may also want to talk with your referring doctor or GP, who may prescribe medication to help you relax (although you must be awake and alert from an fMRI scan to work). Unfortunately, we cannot prescribe this medication for you in the MRI department.

## Are there any alternatives?

Your doctor has referred you for an fMRI scan as they feel that this is the best option for you. Often, they will have referred to 'best practice' guidelines when deciding on the most appropriate imaging test to use. Alternatives may be available but may not provide the same level of information. If you would prefer not to have an fMRI scan, you should discuss this with your doctor.

## How can I prepare for the scan?

There is very little preparation required for an fMRI scan.

If you are taking any medicines, please continue to take these as usual unless you have been told otherwise by your doctor. It would also be advisable to arrive well hydrated. This will help if we need to do an injection of contrast dye.

If you need to bring your children with you, please bring along an adult who can supervise them while your scan is underway. Unfortunately, we are unable to offer childcare facilities.

**Please tell us if you have a cardiac pacemaker or any other cardiac device or if you have had surgery within the previous six weeks. This may affect how we perform your scan and may require us to reschedule your scan.**

**If you are or think you may be pregnant, please also tell us before your appointment.**



## What do I need to wear?

Metal fastenings like zips, poppers and hooks and eyes will affect the scan, so we may ask you to change into a hospital gown. Hairbands, grips, earrings, hearing aids and metallic dentures will also need to be removed. Dental fillings will not affect the scan.

## Will I feel any pain?

You should not feel any pain or any unpleasant sensations during your scan. We will do our best to make you as comfortable as possible while lying down. However, if you find it uncomfortable to lie still, then please tell the Radiographer.

## What are the risks?

MRI scans are not for everyone. The strong magnetic field associated with the scanner may interfere with certain medical implants and pose a potential safety risk if not managed appropriately. Therefore, the radiographers will perform safety screening checks with you before your scan using a safety questionnaire which everyone entering the scanning room must complete.

Otherwise, there are no known risks of having an MRI scan.

Sometimes, we may need to give you an injection of contrast dye during your scan. We have a separate information leaflet about contrast dye which we will share with you if it applies to your scan. That leaflet explains the benefits and risks of MRI contrast agents.

## What happens after the scan?

When the fMRI scan is complete, you are free to leave the department. However, if you have had a contrast dye injection, we may ask you to wait for 10-15 minutes before you go. This is to ensure that there is no sign of an allergic reaction to the contrast dye.

You can eat and drink as normal and resume your usual activities straight after the scan.

The results of your fMRI scan will not be given to you immediately. The images will be processed and analysed, and the report will be sent to your neurosurgeon. fMRI images are very complex, and the analysis process can take up to 48 hours before a radiologist can report the scans. Your neurosurgeon will discuss the results with you and their influence on your treatment.

## Contact Us

If you have any questions or concerns about having an fMRI scan, please contact the MRI department at the Queen Square Imaging Centre on **020 7833 2513**, Monday to Friday between 9 am and 5 pm.

If you need an interpreter or information about your care in a different language or format, please get in touch