

MRI: Functional Brain Scan

How to prepare and what to expect

A functional MRI of the brain is a scan that measures the quick, tiny changes that take place in active parts of the brain. This handout explains how the scan works, how it is done, how to prepare for it, what to expect during the scan, and how to get your results.

What is a functional MRI scan?

*Magnetic resonance imaging (MRI) uses radio waves and a strong magnetic field to take clear and detailed pictures of the body's organs and tissues. A functional MRI scan of the brain uses MRI to measure the quick, tiny changes that take place in active parts of the brain. A functional MRI is also called an *fMRI*.*

We know the general areas of the brain where speech, sensation, memory, and other functions occur. But, the exact sites for these functions vary from person to person. Other parts of the brain may also take over some tasks after injury or disease, such as stroke or a brain tumor.

An fMRI scan lets radiologists look closely at the brain. It helps them see exactly which part of the brain is handling thought, speech, movement, sensation, and other tasks. This is important when planning surgery, radiation therapy, or other treatment so that we know what areas to avoid.

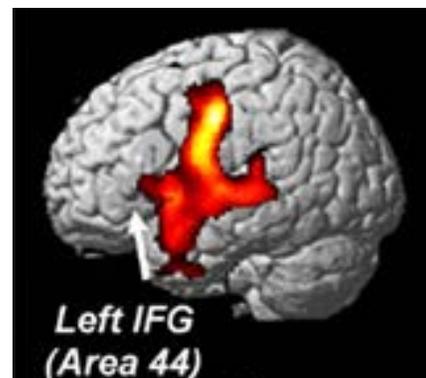
How does the scan work?

For your fMRI scan, you will do tasks while MRI pictures are taken. Activity will increase in the area of your brain that is in charge of the task you are doing. This extra brain activity includes:

- Blood vessels getting larger
- Chemical changes occurring
- Extra oxygen being delivered to that part of the brain

These activities are all signs that the brain is working normally. They will show up as a change in the MRI image.

A *neuroscientist* (a doctor who specializes in studying the nervous system) may work with you before your MRI scan to explain the tasks you will be doing.



An example of one fMRI scan image.

For Your Safety

Health Review

We need to know about certain **health conditions** before giving you an MRI scan. Please tell us if you:

- Have any problems with your liver or kidneys
- Need a liver or kidney transplant
- Are on dialysis
- Have allergies to any drugs or contrast material
- Have had any surgeries
- Are pregnant or may be pregnant

Metal Review

We also need to know if you have any **metal in or on your body** before we give you an MRI scan. The strong MRI magnet will pull on any *ferromagnetic* object, such as iron and some other metals.

If you have any metal on or in your body, an MRI can harm you. Even small amounts that will not harm your body can distort the MRI picture.

Please tell MRI staff if you have:

- Aneurysm clips, a heart pacemaker (or artificial heart valve), an implanted port, an infusion catheter (with brand names such as Port-o-cath, Infusaport, or Lifeport), an intrauterine device (IUD), any metal plates, clips, pins, screws, or surgical staples, a prosthetic hip, or any implanted metal object in your body

In most cases, surgical staples, clips, plates, pins, and screws are not a risk during MRI if they have been in place for more than 4 to 6 weeks. If there is any question of metal fragments, an X-ray may be done to check for them.

- Tattoos or permanent eyeliner
- Medicine patches
- A bullet or shrapnel in your body
- Ever worked with metal
- Tooth fillings or braces

Dental work is not usually affected by the MRI, but fillings and braces may distort pictures of the face or brain.

Please also **remove any other items that might contain metal** and affect your MRI pictures. These include:

- Hairpins
- Jewelry
- Glasses, hearing aids, and any removable dental work

How is the scan done?

- You will lie on a sliding table. The MRI technologist will place your head in a brace to help hold it still. The brace may include a mask created just for you.
- The technologist will slide the table so that your head is inside the MRI unit. The technologist will then leave the room to take the MRI pictures.
- You will be asked to do a number of small tasks, such as tapping the thumb of one hand against each of the fingers of that hand, rubbing a block of sandpaper, or answering simple questions. You will also read short statements or view pictures on a screen.
- You will be able to talk with the MRI technologist during the scan through an intercom.
- Based on how many pictures are needed, the scan will take from 30 to 60 minutes. A very detailed study may take longer.
- You will be asked to hold very still while the MRI pictures are being taken, to avoid blurring the images.
- Some patients will need an injection of *contrast* to make some tissues or blood vessels easier to see. The contrast is injected about halfway through the scan. If you need contrast, it will be injected through a small needle and an *intravenous* (IV) line in an arm or hand vein.
- After the scan, you will be asked to wait until the pictures are checked for quality. More pictures will be taken if needed.

What will I feel during the MRI scan?

- MRI does not cause pain.
- Some patients may feel confined or uneasy (*claustrophobic*) when they are inside the MRI unit. Please tell the doctor who referred you for the MRI if you are claustrophobic. You may receive medicine to help you relax.
- You may notice a warm feeling in the area where the scan is being done. This is normal. If it bothers you, tell the MRI technologist.

- If a contrast injection is needed, you may feel discomfort or coolness at the injection site.
- For many people, the loud tapping or knocking noises at certain times of the scan are annoying. We will provide you with earplugs to mask the noise. We cannot provide music, since sounds activate different parts of the brain and will affect the scan results.

Who interprets the results and how do I get them?

A neuroscientist and a *neuroradiologist* (a radiologist who specializes in diagnosing and treating diseases of the nervous system) will review and interpret your MRI images. The neuroradiologist will not talk with you about the results, but will send a report to your primary care or referring provider. This provider will give you the results.

Questions?

Your questions are important. Call your doctor or health care provider if you have questions or concerns.

- UWMC Imaging Services: 206.598.6200
- Harborview Imaging Services: 206.744.3105