

MRI Safety information

What is magnetic resonance imaging (MRI)?

MRI, or magnetic resonance imaging, is a means of "seeing" inside of the body in order for doctors and clinicians to look at the state of the tissues, organs and joints. MRI does not rely on the type of radiation (i.e., ionizing radiation) used for an x-ray or computed tomography (CT) scans. The MRI examination requires specialised equipment that uses a powerful, constant magnetic and dedicated equipment including a powerful computer to create very clear pictures of internal body structures.

What is MRI used for?

MRI has become the preferred procedure for diagnosing a large number of potential problems in many different parts of the body. In general, MRI creates pictures that can show differences between healthy and unhealthy tissue. Doctors use MRI to examine the brain, spine, joints (e.g., knee, shoulder, wrist, and ankle), abdomen, pelvic region, breast, blood vessels, heart and other body parts.

Is MRI safe?

To date, hundreds of millions of patients have had MRI examinations. MRI has been shown to be extremely safe as long as proper safety precautions are taken. In general, the MRI procedure produces no pain and causes no known short-term or long-term tissue damage of any kind.

The powerful magnetic field of the scanner can attract certain metallic objects known as 'ferromagnetic' objects, causing them to move suddenly and with great force towards the center of the MRI scanner. This may pose a risk to the patient or anyone in the way of the object. Therefore, great care is taken to prevent ferromagnetic objects from entering the room with the MRI scanner. It is vital that you remove metallic objects in advance of an MRI examination, including watches, jewellery and items of clothing that have metallic threads or fasteners.

All MRI facilities have screening procedures that, when carefully followed, will ensure that the Radiographer (a specially trained clinician who operates the scanner) and Consultant Radiologist (a specially-trained Doctor who is able to interpret the scans) knows about the presence of metallic implants and materials so that special precautions can be taken (see below). In some unusual cases the examination may be cancelled because

of concern related to a particular implant or device. For example, if an MRI is ordered, it may be cancelled if the patient has a ferromagnetic aneurysm clip because of the risk dislodging the clip from the blood vessel. Also, the magnetic field of the scanner can damage an external hearing aid or cause a heart pacemaker to malfunction. If you have a metallic fragment in your body there is a potential risk that it could change position, possibly causing injury.

How to prepare for the MRI examination.

There's no special preparation necessary for the MRI examination. Unless your doctor specifically requests that you not eat or drink anything before the exam, there are no food or drink restrictions. Continue to take any medication prescribed by your doctor unless otherwise directed.

You won't be allowed to wear anything metallic during the MRI examination, so it would be best to leave watches, jewellery or anything made from metal at home. Even some cosmetics contain small amounts of metals, so it is best to not wear make-up.

Items that need to be removed by patients before entering the MRI scanner room include:

- Purse, wallet, money clip, credit cards, cards with magnetic strips
- Electronic devices such as pagers or mobile phones
- Hearing aids
- Metal jewellery, watches
- Pens, paper clips, keys, coins, safety pins
- Hair clips, hairpins
- Any article of clothing that has a metal zipper, buttons, snaps, hooks, underwires, or metal threads
- Shoes, belt buckles

Before the MRI procedure, you will be asked to fill out a screening form asking about anything that might create a health risk or interfere with imaging. You will also undergo an interview with your Radiographer to ensure that you understand the questions on the form. Even if you have undergone an MRI before at this or another facility, you will still be asked to complete an MRI screening form.

Examples of items or things that may create a health hazard or other

problem during an MRI exam include:

- Pacemaker
- Implantable cardioverter defibrillator (ICD)
- Neurostimulator
- Aneurysm clip
- Metal implant
- Implanted drug infusion device
- Foreign metal objects, especially if in or near the eye
- Shrapnel or bullet wounds
- Permanent cosmetics or tattoos
- Dentures/teeth with magnetic keepers
- Other implants that involve magnets
- Medication patch (i.e., transdermal patch) that contains metal foil

Check with the Radiographer or Consultant Radiologist at the Centre if you have questions or concerns about any implanted object or health condition that could impact the MRI scan. This is particularly important if you have undergone surgery involving the brain, ear, eye, heart, or blood vessels.

Important Note: If you are pregnant or think that you could be pregnant, you must notify your Doctor or the MRI Radiographer at the Centre prior to the MRI scan.

Before entering the MRI room, any friend or relative that might be allowed to accompany you will be asked questions to ensure that he or she may safely enter the MRI room and will likewise be instructed to remove all metallic objects. Additionally, this individual will need to fill out a screening form.

What is the MRI examination like?

The MRI examination is performed in a special equipped room that houses the MRI scanner. You will be escorted into the room by your Radiographer and asked to lie down on a comfortably padded table that gently glides you into the scanner.

In general, in preparation for the MRI examination, you may be required to wear earplugs or headphones to protect your hearing because, when certain scanners operate, they may produce loud noises. These loud noises are normal and should not worry you. You will be offered the opportunity to listen to some music, firstly to create a more relaxing

environment and secondly to reduce the noise the MRI makes.

For some MRI studies, a contrast agent called "gadolinium" may be injected into a vein to help obtain a clearer picture of the area being examined. At some point during the examination, your Radiographer will slide the table out of the scanner in order to inject the contrast agent. This is typically done through a small needle connected to an intravenous line that is placed in an arm or hand vein. A saline solution will drip through the intravenous line to prevent clotting until the contrast material is injected at some point during the exam. Unlike contrast agents used in x-ray studies, MRI contrast agents do not contain iodine and therefore rarely cause allergic reactions or other problems.

The most important thing for the patient to do is to relax and lie still. Most MRI scans take between 15 to 30 minutes to complete depending on the body part imaged and how many images are needed, although some may take as long as 60-minutes or longer if multiple body parts need to be scanned. You will be told ahead of time just how long your scan is expected to take.

You will be asked to remain perfectly still during the time the imaging takes place, but between sequences some minor movement may be allowed. Your Radiographer will advise you, accordingly.

When the MRI scan begins you may breathe normally, however, for certain examinations it may be necessary for you to hold your breath for a short period of time.

During your MRI examination, the Radiographer will be able to speak to you, hear you, and observe you at all times. If you have any questions or feel anything unusual then just press the buzzer you will be given.

When the MRI procedure is over, you may be asked to wait until the images are examined to determine if any more are needed. After the scan, you have no restrictions and can go about your normal activities.

Once the entire MRI examination is completed, the pictures will be looked at by the Consultant Radiologist for your referring doctor or clinician. The Radiologist will then send them a report of the findings. You should then contact your doctor or clinician to go over your results and discuss the next steps.