



Taichung Armed Forces General Hospital Magnetic Resonance Imaging Instructions

This instruction sheet
shall be kept by
patient (or patient's
family)

磁共振造影檢查說明書

Introduction to magnetic resonance imaging

Magnetic resonance imaging (MRI) is an imaging tool that does not use radiation to provide clear images of soft tissues. It is widely used in diagnosing sports injuries, especially in areas such as the knees, shoulders, hip, elbows, and wrists. Doctors can use the images to view even small tears or injuries to ligaments and muscles. It has an even wider application in the central nervous system, gastrointestinal and urinary systems, and vascular system. Its cardiovascular applications in recent years have enabled direct imaging of the coronary artery. Because MRI scans require the use of a strong magnetic field, which affects paramagnetic metal objects in the body, it is important to clearly know whether the patient has implanted devices such as an artificial joint, pacemaker, artificial heart valve, intrauterine device, or pins, screws, or surgical staples.

Tattoos or eyebrow tattoos may also cause some issues. For possible presence of a bullet or grenade in the body or metal shavings in the work environment, if there is any suspicion, you will be asked to take an X-ray image to confirm the presence of metal. Dental fillings are not affected by the magnetic field, but they may interfere with imaging of the face or brain.

Precautions before examination

Please wear comfortable and light clothing for the examination, or change into an examination gown as instructed by the healthcare professional. Do not wear clothes with metal accessories. Depending on the area being examined, you may be asked to remove hair accessories, jewelry, glasses, hearing aids, or removable dentures at the examination. If you may be pregnant, please inform the radiographer before the examination.

If you have had brain, heart, or spine surgery, or have a history of drug allergies, please inform the radiographer or nurse in advance.

Examination process

- During the examination, the radiographer will arrange for you to lie on the examination table and install a special coil device. Then, the radiographer will operate the equipment from the control room next door. Throughout the process, the radiographer can monitor you through the transparent glass, and you can communicate with the radiographer via an intercom. In certain situations, or when a child needs to undergo an examination, one family member may be allowed to accompany the patient in the examination room.
- The examination takes 30 to 60 minutes. You must keep your body still during the examination. Sometimes you may be injected with a contrast agent depending on individual needs. Patients with impaired kidney function who receive a gadolinium-based contrast agent have a 3-5% chance of developing nephrogenic systemic fibrosis (NSF).
- During the examination, you will repeatedly hear a knocking-like noise, which is the normal operation of the gradient magnetic field. This may cause discomfort to you, and earplugs are provided in the examination room to help alleviate this discomfort.

➤ Claustrophobia:

Patients with claustrophobia (the vast majority of patients with phobia like this do not know they have it) may experience significant discomfort in a small examination room. If you are unable to use an elevator or stay in a room without windows, please inform your doctor or radiographer in advance, as the MRI scan room is a relatively confined space.

 Examination instructions

Magnetic Resonance Imaging (MRI) scanning is a special examination conducted in a strong magnetic field. To ensure the safety of the patient and improve diagnostic accuracy, please follow the following instructions:

1. Individuals with a pacemaker, those who have undergone vascular surgery (with hemostatic clips staying in place), and those who have had artificial heart valve replacement surgery are not suitable for this examination, and are not allowed to enter the examination room to avoid hazards.
 2. If you have any of the following conditions, which may not be suitable for MRI, please be sure to inform the staff in the examination room:
 - * Previous surgery (using hemostatic clips, steel wire sutures, or steel plates or nails for fixation).
 - * Implantation of an artificial joint, cochlear implant, inferior vena cava filter, heart catheter, implanted insulin injector, internal electrode stimulator, nerve stimulator, implanted drug injectors, metal dentures, or dental prostheses.
 - * Previous trauma or shrapnel injuries (suspected metal fragments or shrapnel remaining in the body or eye socket).
 - * Women who are pregnant or have contraceptive devices.
 3. Before the examination, you must change into the examination gown and remove all metal items worn on the body, such as dentures, necklace, earrings, hairpins, brooches, rings, bras, badges, metal buttons, clothes with zippers, watches, keys, and belts to avoid affecting the examination results.
 4. Please do not bring debit cards, credit cards, phone cards or other similar items into the examination room to avoid losing their functionality.
 5. For head examinations, please avoid wearing makeup, applying hair gel, dyeing hair, drawing eyeliner, or wearing hair accessories or hairpins.
 6. MRI often requires intravenous injection of a contrast agent to confirm the presence of lesions. Contrast agents used in MRI are much safer than those used in standard X-ray exams, but there is still a small chance that some patients may experience adverse reactions (patients with poor kidney function who receive a gadolinium-based contrast agent have a 3-5% chance to develop NSF).
 7. For abdominal MRI, please fast for six hours before the examination, except for small amounts of water and medications.
- Please bring your health insurance card and arrive on time at the Radiology Department to check in. Please wait patiently for your examination.
- * Note: If you wish to cancel the examination, please call the registration desk of the Radiology Department promptly at 04-23934191, extension 525415 to pass the opportunity of undergoing this examination to someone who needs it.

Taichung Armed Forces General Hospital

Magnetic Resonance Imaging (MRI) Consent Form

(Please review the examination instructions carefully and wait for the doctor to explain the examination to you before signing the consent form)

* Basic Information

Patient Name _____

Patient Date of Birth ____YYYY____MM____DD

Patient Medical Record No. _____

Name of Attending Physician _____

I. Examination planned (provide brief explanation if not familiar with the medical terms)

1. Disease name:
2. Name of examination planned:
Magnetic resonance imaging (MRI)
3. Reason for the planned examination:

II. Physician statement

1. I have explained the examination to the patient in ways as comprehensible as possible to provide the patient with the relevant information, particularly the following:

- ☐ Reason why the examination must be performed, method and site of the examination, and risks and success rate of the examination.
- ☐ Examination complications and possible management methods.
- ☐ Patients with impaired kidney function are informed that there is a 3-5% chance of developing nephrogenic systemic fibrosis (NSF) if they receive a gadolinium-based contrast agent.
- ☐ Patients with any of the following conditions have been informed that they should not undergo this examination to avoid potential risks:

Presence of a pacemaker, artificial heart valve, previous aneurysm surgery with hemostatic clips used, cochlear implants, inferior vena cava filter, cardiac catheter, implanted insulin injector, implanted electrode stimulator, neurostimulator, drug infusion pump, and previous trauma or blast injury with possible residual metal fragments or shrapnel in the body, particularly in the eye socket.

- ☐ I have given the patient any other information available related to the treatment.

2. I have provided the patient with adequate time to ask the following questions about the examination and I have answered the questions:

(1) _____

(2) _____

(3) _____

Signature of attending physician:

Date: YYYY MM DD

Time: hh mm

III. Patient statement

1. The doctor has explained to me and I have understood the information related to the necessity, steps, and risks of the examination.
2. The doctor has explained to me and I have understood the possible prognosis of the examination and risks if the examination is not performed.
3. The doctor has explained to me and I have understood that a patient with impaired kidney function ($GFR < 30 \text{ ml/min/1.73m}^2$) has a 3-5% chance of developing nephrogenic systemic fibrosis (NSF) when receiving a gadolinium-based contrast agent. I also understand that for certain conditions, not injecting the contrast agent can reduce the value of the examination and the accuracy of the diagnosis.
4. The doctor has explained to me that situations that are immediately life-threatening, if any, during the examination will be treated according to appropriate steps.
5. I understand that this examination may be the best option now.

Based on the above statement, I hereby give my consent to this examination. If required by my condition, I ☐ agree ☐ do not agree to receive injection of a contrast agent.

Consenter Signature:

Relationship to patient:

Address:

Telephone:

Date: YYYY MM DD

Time: hh mm

Witness:

Signature:

Date: YYYY MM DD

Time: hh mm

Notes:

- I. If the consenter is not the patient, the relationship to the patient should be indicated in the "Relationship to patient" field.
- II. The fields for the witness may be left blank if no witness is available.
- III. If the patient is a minor, a legal representative should sign the consent form.
- IV. The contrast agent used in this examination is a compound containing gadolinium.
 - (1) This contrast agent is very stable in body tissues and has a high level of safety. According to data, it has a very low incidence of adverse reactions and allergies (1.14% to 3%). Most of these reactions are very mild, such as a strange taste in the mouth after injection, a local warm or mild pain at the injection site, nausea, headache, and dizziness. More serious reactions, such as localized body twitching, urticaria, facial flushing, sore throat, rapid heartbeat, and arrhythmia, are less common (incidence of approximately 0.01% to 0.07%). Severe allergic reactions, such as shock leading to death, are extremely rare.
 - (2) According to a warning issued by the U.S. Food and Drug Administration (FDA), gadolinium-based compounds pose a risk of nephrogenic systemic fibrosis (NSF) in the following patients.
 1. Patients with acute or chronic renal insufficiency (actual or estimated glomerular filtration rate (GFR) lower than $30 \text{ ml/min/1.73m}^2$).
 2. Patients with any degree of renal insufficiency caused by hepatorenal syndrome or occurring during the pre- or post-liver transplantation period.These patients are recommended to undergo MRI requiring a gadolinium-based contrast agent after recovery to normal renal function (patients with acute renal insufficiency) or receive an alternative examination or non-contrasted MRI.