TEST

Chest MRI

A chest MRI creates detailed images of structures inside your chest using magnets and radio waves.

WHAT IT MEASURES
Detailed anatomy and tissue features inside the chest

SAMPLE
None; images made with magnetic fields and radio waves

FASTING NEEDED?
Sometimes, if sedation or your imaging service requires it

HOW LONG IT TAKES
Usually 30 to 60 minutes

RESULTS IN
Usually several days; turnaround varies by imaging service

USED FOR
Diagnosis, treatment planning, and monitoring

MAIN LIMITATION
Breathing motion and air limit fine lung detail

Overview

A chest magnetic resonance imaging scan, or chest MRI, creates detailed pictures of structures inside your chest using a strong magnet, radio waves, and a computer. It does not use X-rays or ionizing radiation.

MRI can show the chest wall, the space between the lungs called the mediastinum, major blood vessels, lymph nodes, the lining around the lungs, and some parts of the heart. It is particularly useful for distinguishing soft tissues and examining a mass found on another scan.

MRI is not usually the best test for fine lung detail because air produces little MRI signal and breathing causes movement. CT is often better for small lung nodules, calcium, and many lung conditions.

Some scans use a gadolinium-based contrast agent injected into a vein to make certain tissues and blood vessels easier to see.

Why the test is ordered

A chest MRI may investigate an abnormality found during an examination or on an X-ray, CT scan, or ultrasound. It may be used to:

A standard chest MRI differs from dedicated cardiac and breast MRI, which use specialized methods.

- Examine a mass in the chest wall or mediastinum
- Determine whether an abnormality involves nearby muscles, bones, nerves, or blood vessels
- Assess selected blood vessel or congenital conditions
- Plan surgery, radiation treatment, or another procedure
- Monitor a condition after treatment
- Avoid repeated ionizing radiation when MRI can answer the same question

Who should have the test

Chest MRI may be considered when detailed soft-tissue imaging can answer a specific medical question or avoiding ionizing radiation is important.

Tell the imaging service if you have:

Many modern implants can be scanned only under specific conditions. Others require device records, special settings, or a different test. Bring the implant identification card if available, and do not assume an implant is either safe or automatically disqualifying.

- A pacemaker, defibrillator, cochlear implant, medicine pump, or neurostimulator
- Metal clips, coils, stents, plates, screws, artificial joints, or metal fragments
- Previous surgery involving an implanted device
- Kidney disease or dialysis
- A previous reaction to MRI contrast
- Pregnancy or possible pregnancy
- Severe claustrophobia or difficulty lying flat

How to prepare

Follow your imaging service's instructions. Most chest MRI scans do not require fasting, but you may need to stop eating and drinking for several hours if sedation is planned or the facility has specific contrast requirements.

Take your usual medicines unless told otherwise. Report kidney problems, pregnancy, allergies, and previous contrast reactions.

Before entering the MRI room, remove metal and electronic items, including jewelry, watches, hearing aids, removable dental work, piercings, keys, and clothing with metal fasteners. Cosmetics, medication patches, and clothing may contain metal, so you may need to change into a gown.

Bring implant information. If you are claustrophobic, contact the service beforehand to discuss support, anti-anxiety medicine, or sedation. Arrange transport home if you will receive sedation.

What happens during the test

You will lie on a padded table, usually on your back. A device called a coil is placed around or near your chest to receive MRI signals. If contrast is needed, an intravenous line, or IV, is inserted into your hand or arm.

The table moves into a tube-shaped scanner. Staff remain outside but can see, hear, and speak with you. The scanner makes loud tapping or thumping sounds, so you will receive ear protection.

The scan does not normally hurt, but you must remain still and may need to hold your breath briefly to prevent blurred images. A typical appointment takes 30 to 60 minutes. Contrast, sedation, repeated images, or specialized imaging may make it longer.

Understanding your results

A radiologist reviews the images and sends a report to the clinician who requested the scan. The report may compare the MRI with earlier scans and describe a finding's size, location, shape, borders, tissue features, and contrast pattern.

There is no single normal range. Interpretation depends on the clinical question, personal medical history, previous treatment, and imaging method.

"Indeterminate" means the images do not fully establish what a finding represents. Incidental findings are changes discovered while looking for something else. Many are not urgent, but

some require comparison with older scans or follow-up imaging.

What affects the results

Factors that can affect chest MRI include:

Body size, shortness of breath, or fluid around the lungs may make positioning and breath-holding harder. Kidney function and pregnancy may affect whether gadolinium contrast is used. Food, coffee, exercise, medicines, and time of day generally do not alter routine chest MRI results, although sedation has separate preparation rules.

- Breathing, coughing, swallowing, heartbeat, or other movement
- Difficulty holding your breath
- Metal implants or fragments that distort nearby images
- A protocol not designed for the organ or question
- Contrast timing or problems delivering contrast through the IV
- Previous surgery, radiation, infection, or inflammation
- Lack of earlier scans for comparison

Accuracy and limitations

Chest MRI has no single accuracy figure. Performance depends on the condition, structure examined, scanning method, movement, and use of contrast.

MRI distinguishes many soft tissues well but may miss very small lung nodules or subtle lung changes. CT is generally better for calcium and fine lung, bone, or airway detail, and is often preferred in emergencies because it is faster. Dedicated cardiac MRI is more suitable for many heart questions.

Movement can hide abnormalities, while benign changes may resemble concerning ones. The report may recommend comparison with previous imaging, CT, specialized MRI, or monitoring over time. Imaging cannot always identify exactly what a mass is, so a biopsy may be needed.

Risks and complications

MRI does not use ionizing radiation. However, its strong magnetic field can move unsafe metal objects or interfere with implants, making safety screening essential.

The scanner may feel confined, and lying still can cause temporary stiffness. Rarely, metal in clothing, patches, tattoos, or implants can heat. Tell staff immediately if you feel burning or unusual warmth.

An IV can cause brief pain, bruising, or swelling. Gadolinium contrast may cause nausea, headache, or a rash. Serious allergic-like reactions are uncommon. In people with severe kidney failure, some agents have been associated with the rare condition nephrogenic systemic fibrosis. Screening and careful contrast selection reduce this risk.

Small amounts of gadolinium can remain in the body after a scan; no harmful effect has been established in people with normal kidney function. Contrast is used only when it adds useful information.

Sedation has additional risks and requires monitoring. Do not drive afterward if you receive it.

What happens next

Results are usually sent to the clinician who requested the scan. Follow-up may include discussing the report, comparing earlier images, or arranging another test. A follow-up recommendation does not necessarily mean a serious condition was found.

Radiology staff may contact the referring team directly about urgent findings. Do not wait for a scheduled MRI or its results if you develop severe chest pain, severe difficulty breathing, fainting, or cough up a large amount of blood. Seek emergency care.

After contrast, seek urgent help for facial or throat swelling, trouble breathing, or widespread hives. Report increasing pain, redness, or swelling at the IV site.

Common questions

Can I drink coffee before a chest MRI?

Usually, but follow your instructions. Avoid it if you must fast for sedation or have been told otherwise.

Does the time of day matter?

Usually not. Morning and afternoon scans generally provide similar image quality.

Can I exercise beforehand?

Routine exercise usually does not affect the scan. Avoid strenuous activity if it worsens symptoms or makes lying still difficult.

Will I need contrast?

Not always. Contrast may better show blood vessels, inflammation, blood supply, or an abnormality's boundaries. The decision depends on the clinical question, kidney function, and pregnancy status.

What if I am claustrophobic?

Tell the imaging service in advance. Options may include additional support, a wider scanner, anti-anxiety medicine, or sedation. You may need someone to take you home afterward.

Can I have an MRI with metal in my body?

Sometimes. Safety depends on the item, location, and model. Provide implant records and complete the safety questionnaire so staff can confirm whether scanning is safe.

Sources

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- American College of Radiology. ACR Manual on MR Safety, 2024
- American College of Radiology. ACR Manual on Contrast Media
- US Food and Drug Administration. Gadolinium-based contrast agents: retention in the body and required class warnings
- NHS. MRI scan
- American College of Obstetricians and Gynecologists. Guidelines for Diagnostic Imaging During Pregnancy and Lactation