TEST

Lumbar MRI scan

A lumbar MRI uses a magnetic field to create detailed images of your lower spine.

WHAT IT MEASURES
Detailed images of lower spine bones, discs, nerves, and tissues

SAMPLE
None

FASTING NEEDED?
Sometimes, if sedation is planned

HOW LONG IT TAKES
Usually 20-45 minutes

RESULTS IN
Usually 1-3 days; timing varies by imaging service

USED FOR
Diagnosing and monitoring lower spine conditions

MAIN LIMITATION
Common age-related changes may not explain your symptoms

Overview

A lumbar MRI scan creates detailed pictures of your lower back. The lumbar spine contains five main vertebrae, which are the bones between your rib cage and pelvis. The scan also shows the spinal discs, nerves, spinal canal, ligaments, and nearby soft tissues.

MRI stands for magnetic resonance imaging. It uses a strong magnetic field and radio waves rather than X-rays. You are not exposed to ionising radiation.

A lumbar MRI can show changes such as a slipped or herniated disc, narrowing around the nerves, inflammation, infection, injury, or a mass. However, a finding on MRI does not always explain pain. Disc bulges and other age-related changes are common in people without back symptoms.

Some scans use a gadolinium-based contrast medicine. Contrast can make certain tissues or abnormal areas easier to see. Most routine lumbar MRI scans do not require it.

Why the test is ordered

A lumbar MRI may be requested when detailed images could change your care. Reasons include:

MRI is not usually the first test for a short episode of uncomplicated lower back pain. Early imaging often finds changes that are unrelated to the pain and may not improve treatment decisions.

- Persistent back or leg symptoms that have not improved as expected
- Leg pain, numbness, tingling, or weakness suggesting nerve irritation
- Severe or worsening neurological symptoms
- Concern about infection, cancer, fracture, or inflammation
- Planning an injection or operation
- New symptoms after previous lumbar surgery
- Monitoring a known spinal condition

Who should have the test

You may benefit from lumbar MRI if your symptoms, examination, or medical history suggest a problem that needs detailed imaging. The decision is based on the whole clinical picture rather than pain severity alone.

MRI may be especially useful when there is concern about pressure on spinal nerves, infection, a tumour, or complications after surgery. It may also be appropriate when symptoms continue and surgery or another procedure is being considered.

Tell the imaging service before your appointment if you have:

Many modern implants can be scanned under specific conditions. Staff need the implant name or device card so they can check its MRI safety information.

- A pacemaker, implanted defibrillator, nerve stimulator, or medicine pump
- A cochlear implant, aneurysm clip, metal fragment, or other implant
- Previous surgery involving metal hardware
- Severe kidney disease or dialysis
- A previous reaction to MRI contrast
- Pregnancy or possible pregnancy
- Claustrophobia or difficulty lying flat

How to prepare

Follow the instructions from your imaging service. For a routine scan without sedation, you can usually eat, drink, and take your regular medicines as normal.

You may need to avoid food and drink for a set time if sedation is planned. Sedation is medicine that helps you relax or become sleepy. Local rules may also apply when contrast is being considered.

Remove jewellery, watches, hearing aids, removable dental items, and clothing containing metal. You may be asked to wear a gown. Do not take phones, bank cards, or other electronic items into the scanner room.

Bring details of implants and previous spine surgery. If you have severe kidney disease, a blood test may be needed before gadolinium contrast is given. Arrange transport home if you will receive sedation.

What happens during the test

You lie on a padded table, usually on your back. A support may be placed under your knees to make the position more comfortable. The table moves into the MRI scanner, which is shaped like a short tunnel.

The scanner makes loud knocking, tapping, and buzzing sounds. You receive ear protection and can communicate with the radiographer throughout the scan. A radiographer is a healthcare professional trained to perform medical imaging.

You need to keep still while each set of pictures is taken. Some sequences last several minutes. Movement can blur the images.

If contrast is required, a small plastic tube is placed into a vein, usually in your arm or hand. The contrast is injected partway through the appointment. The full scan commonly takes 20 to 45 minutes, although additional images or contrast can make it longer.

Understanding your results

A radiologist, a doctor trained to interpret medical images, reviews the scan. The report describes the structures examined and any findings that may be important.

Terms you may see include:

MRI findings must be compared with your symptoms and examination. For example, a disc

bulge on the left may be less relevant if your symptoms are only on the right.

There is no universal "normal range" for a lumbar MRI. Interpretation varies with age, sex, pregnancy status, previous procedures, medicines, and clinical context. Reporting practices also differ between imaging services.

- Disc degeneration: wear-related drying or thinning of a spinal disc
- Disc bulge or herniation: disc material extending beyond its usual edge
- Stenosis: narrowing of the spinal canal or spaces around nerves
- Nerve root compression: pressure on a nerve leaving the spine
- Facet arthropathy: wear-related change in the small spinal joints
- Marrow change: altered appearance inside a vertebral bone

What affects the results

Movement is one of the main causes of unclear images. Pain, coughing, anxiety, or difficulty lying flat can make it harder to remain still. Tell the radiographer if you need help getting comfortable.

Metal from previous surgery can distort the magnetic field and hide nearby tissues. Special MRI sequences may reduce this effect, but they cannot always remove it.

The scan protocol matters. Routine images may not answer a specialised question unless the imaging service knows what is being investigated. Contrast can help assess infection, inflammation, some tumours, and changes after surgery, but it is not needed for every disc or nerve problem.

MRI is normally performed while you are lying down. Symptoms caused mainly by standing, bending, or movement may not appear in the same way during the scan.

Recent surgery, injections, or other procedures can produce swelling or tissue changes that resemble disease. Age also affects interpretation because disc and joint changes become more common over time.

Exercise, meals, coffee, most medicines, and a recent blood transfusion do not usually change the underlying lumbar MRI findings. Kidney function affects whether contrast is suitable, not the quality of a non-contrast scan. Pregnancy mainly affects decisions about timing and contrast rather than the appearance of the spine.

Accuracy and limitations

Lumbar MRI is very good at showing discs, nerves, the spinal canal, bone marrow, and soft tissues. It can still miss subtle abnormalities, especially if movement reduces image quality or the problem occurs only in certain positions.

There is no single rate for how often lumbar MRI misses a problem or reports a finding that is not clinically important. Accuracy changes with the condition being investigated, the scan technique, image quality, and the experience of the reader.

A common limitation is finding an abnormality that is real but not causing symptoms. This can make the scan seem "positive" when the finding does not explain your problem.

Other tests may be better for particular questions. CT can show fine bone detail and some fractures more clearly. Standing X-rays can assess alignment while bearing weight. Nerve conduction studies and electromyography test how nerves and muscles function. Blood tests or a biopsy may be needed when infection or a tumour is suspected.

Risks and complications

MRI itself does not use ionising radiation. The strong magnetic field can affect unsafe metal objects or implants, which is why careful safety screening is essential.

The scan is painless, but lying still may worsen discomfort temporarily. Some people feel enclosed or anxious. A wider scanner, additional support, or prescribed sedation may help.

If contrast is used, the needle can cause brief pain or bruising. Allergic-like reactions to gadolinium contrast are uncommon. Serious complications are rare, but kidney function must be considered in people with severe kidney disease.

Sedation has separate risks, including excessive sleepiness and breathing problems. You will need monitoring and must follow instructions about driving and supervision afterward.

What happens next

The report is sent to the healthcare professional who requested the scan. Routine follow-up may involve discussing whether the findings match your symptoms and whether physiotherapy, medicines, an injection, specialist review, or no specific treatment is appropriate.

A report marked as abnormal does not automatically mean you need surgery. Many lumbar spine findings are managed without an operation.

Seek urgent medical assessment if you develop new or rapidly worsening leg weakness, numbness around the genitals or buttocks, loss of bladder or bowel control, or difficulty starting urination. These symptoms can indicate serious pressure on lower spinal nerves.

Also seek prompt medical advice for severe back pain with fever, significant recent injury, or feeling seriously unwell. Do not wait for a routine MRI appointment or report if urgent symptoms develop.

Common questions

Can I drink coffee before a lumbar MRI?

Usually, yes. Coffee does not alter lumbar spine images. Do not drink it if your appointment instructions require fasting for sedation.

Does the time of day matter?

Usually not. Choose a time when you can lie still comfortably and arrive without rushing.

Can I exercise beforehand?

Gentle activity is generally fine. Avoid exercise that sharply worsens your pain or makes lying still difficult.

Will I need an injection?

Not always. Contrast is mainly used for specific concerns, including infection, inflammation, some tumours, or symptoms after surgery.

Can I have an MRI if I have metal in my body?

Possibly. Many implants are MRI-compatible under defined conditions, but staff must check the exact device before scanning.

Can I drive home afterward?

You can normally drive after an MRI without sedation. Do not drive if you received sedation; follow the imaging service's discharge instructions.

Sources

- American College of Radiology Appropriateness Criteria: Low Back Pain - guidance on when lumbar imaging is appropriate

- National Institute for Health and Care Excellence: Low back pain and sciatica in over 16s - recommendations on assessment and imaging
- RadiologyInfo.org: MRI of the Spine - patient information from the ACR and RSNA
- RadiologyInfo.org: Gadolinium Contrast Material - uses and risks of MRI contrast
- NHS: MRI scan - preparation, procedure, and MRI safety information
- U.S. Food and Drug Administration: Gadolinium retention after MRI contrast - safety communication about gadolinium-based contrast agents