HEALTH BASICS

MRI and low back pain

MRI is an imaging test used selectively to look for structural causes of low back pain.

WHAT IT IS
A magnetic scan of the lower spine and nearby tissues

WHERE IT COMES UP
Persistent back pain, nerve symptoms, or concern about serious causes

WHY IT MATTERS
Findings can guide care when they match your clinical assessment

WHAT IT IS NOT
Not a diagnosis or automatic explanation for pain

WHO TO ASK
A primary care clinician, physiotherapist, or relevant specialist

HOW IT IS CHECKED
Clinical assessment first; MRI when findings could change care

Overview

Magnetic resonance imaging, or MRI, uses a strong magnet and radio waves to make detailed pictures of the body. A lumbar spine MRI shows the lower spine, including the discs, nerves, spinal canal, bones, and nearby soft tissues. It does not use X-rays or ionizing radiation.

MRI can help investigate low back pain in selected situations. It may be useful when a clinician suspects a serious underlying condition, when nerve problems are worsening, or when persistent symptoms may lead to surgery or another procedure.

Most new low back pain does not need an immediate MRI. A clinical assessment often provides enough information to begin care safely. This usually includes questions about the pain, your general health, and any nerve-related changes, followed by a physical examination.

An MRI finding is not a diagnosis by itself. Disc bulges, reduced disc height, and other age-related changes are common in people without back pain. The scan needs to be interpreted alongside your symptoms and examination.

How it works

You usually lie on a table that moves into a tunnel-shaped scanner. The machine makes loud knocking or tapping sounds while it records images. You need to keep still, but the scan should not hurt. Ear protection is provided, and you can communicate with the radiography team.

A lumbar MRI may show:

Reports often use terms such as disc degeneration , meaning age-related wear or water loss in a disc; disc bulge , meaning part of a disc extends beyond its usual boundary; and stenosis , meaning narrowing around the spinal canal or a nerve.

These findings do not automatically identify the source of pain. Their location and severity must fit what you are experiencing. For example, pressure on a particular nerve is more meaningful if the pain, numbness, weakness, and examination findings follow that nerve's pattern.

Most lumbar spine scans are performed without contrast dye. A gadolinium-based contrast agent may be considered when more detail is needed, such as after previous spinal surgery or when infection, inflammation, or a mass is being assessed. The reason for contrast should be explained before the scan.

- The discs that cushion the spinal bones
- Nerves leaving the spine
- The spinal canal, which contains nerve tissue
- Joints, ligaments, muscles, and bone marrow
- Areas of inflammation, infection, injury, or abnormal tissue

Why it matters for your health

Using MRI at the right time can help answer a focused medical question. It may confirm serious nerve compression, help define an infection or tumour, or provide information needed to plan an operation or other procedure.

Routine early MRI for uncomplicated low back pain usually does not improve care. Many episodes improve with time and appropriate activity-based treatment. Scanning too early can also reveal common changes that are unrelated to the pain.

An unexpected finding may lead to worry, further tests, or treatment that is unlikely to help. This is why clinicians consider whether the result is likely to change what happens next before requesting a scan.

A normal or nearly normal MRI does not mean that pain is imaginary. Some causes of pain are

not visible on a scan, and pain can be influenced by muscles, joints, sleep, stress, previous injury, and the nervous system's response to movement. MRI is one part of an assessment, not a measure of how much pain you feel.

What can go wrong

The main concern is not that ordinary back pain will become dangerous. It is that a small number of serious conditions can also cause back pain and may require prompt imaging or treatment.

Cauda equina syndrome occurs when nerves at the bottom of the spinal canal are severely compressed. Seek emergency care for new difficulty starting or controlling urination, loss of bowel control, numbness around the genitals or anus, or rapidly worsening weakness in both legs. These symptoms need immediate assessment rather than a routine MRI appointment.

Other conditions that may require urgent assessment include spinal infection, cancer affecting the spine, a spinal fracture, or worsening compression of a nerve. Contact an urgent clinical service if back pain occurs with fever or feeling seriously unwell, follows significant trauma, or is accompanied by new or progressive leg weakness. A history of cancer, weakened immunity, recent serious infection, osteoporosis, or long-term steroid treatment can affect how quickly back pain should be assessed.

MRI itself has no ionizing radiation, but its strong magnet creates important safety issues. Tell the imaging service about implanted devices, metal fragments, previous surgery, pregnancy, kidney problems, and any earlier reaction to contrast. Having metal or an implant does not always prevent MRI; staff must identify the exact device and confirm whether scanning is safe.

Some people find the enclosed space difficult. The imaging service may be able to explain the scanner beforehand, offer practical support, or discuss whether another scanner arrangement is available. Sedating medicine is not routinely needed and requires separate planning if considered.

What you can do

If an MRI is suggested, ask what question the scan is intended to answer and how the result could change your care. This can help you understand why imaging is being requested now rather than earlier or later.

Before the appointment, give the imaging service accurate information about:

Bring details or an implant card if you have one. Do not assume that an implant makes MRI

impossible, and do not enter the scanning room with metal objects unless staff confirm that they are safe.

When reviewing a report, ask which findings match your symptoms and examination. You can also ask whether a finding is common with ageing and whether it changes the recommended treatment.

For ordinary low back pain without warning signs, there may be nothing you need to do specifically about MRI. Routine follow-up is appropriate if pain is not improving as expected, keeps returning, or is limiting daily activities. A clinician can reassess whether imaging or another test has become useful.

Do not wait for routine follow-up if emergency bladder, bowel, saddle-area sensation, or rapidly worsening weakness symptoms develop.

- Implanted devices, clips, pumps, stimulators, or metal fragments
- Previous spinal surgery
- Pregnancy or possible pregnancy
- Kidney disease or dialysis
- Claustrophobia or difficulty lying flat
- Previous problems with MRI contrast

Common questions

Does a disc bulge mean I need surgery?

No. Disc bulges are common, including in people without pain. Surgery is considered only in selected situations, based on symptoms, examination findings, response to non-surgical care, and whether the scan shows a matching problem.

Can MRI show exactly why my back hurts?

Sometimes, but not always. MRI is good at showing anatomy, yet visible changes may not be painful, and some painful conditions do not produce a clear scan abnormality.

Why might a clinician wait before ordering MRI?

Without warning signs or worsening nerve problems, an early scan is unlikely to change initial care. Waiting also allows time to see whether symptoms improve and whether a clearer reason for imaging develops.

Is MRI better than an X-ray or CT scan?

Each test answers different questions. MRI is especially useful for nerves, discs, bone marrow, and soft tissues. X-rays and CT scans may be more appropriate for certain bone injuries or when MRI cannot be performed.

Does MRI contrast contain iodine?

No. MRI contrast usually contains gadolinium, not the iodine-based contrast used for some CT scans. Contrast is not needed for most routine lumbar spine MRI examinations.

Can I have an MRI if I am pregnant?

MRI does not use ionizing radiation, but the imaging team still needs to know about pregnancy or possible pregnancy. The clinical reason for the scan and any proposed contrast are considered before proceeding.

Sources

- American College of Radiology. ACR Appropriateness Criteria: Low Back Pain
- National Institute for Health and Care Excellence. Low back pain and sciatica in over 16s: assessment and management, NG59
- Chou R, Qaseem A, Owens DK, Shekelle P. Diagnostic imaging for low back pain: advice for high-value health care from the American College of Physicians. Annals of Internal Medicine . 2011;154:181-189
- Brinjikji W, Luetmer PH, Comstock B, et al. Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. American Journal of Neuroradiology . 2015;36:811-816
- Radiological Society of North America and American College of Radiology. MRI of the Spine
- US Food and Drug Administration. Gadolinium-based contrast agents are retained in the body; new class warnings required