



# Radiology Rounds

A Newsletter for Referring Physicians  
Massachusetts General Hospital  
Department of Radiology

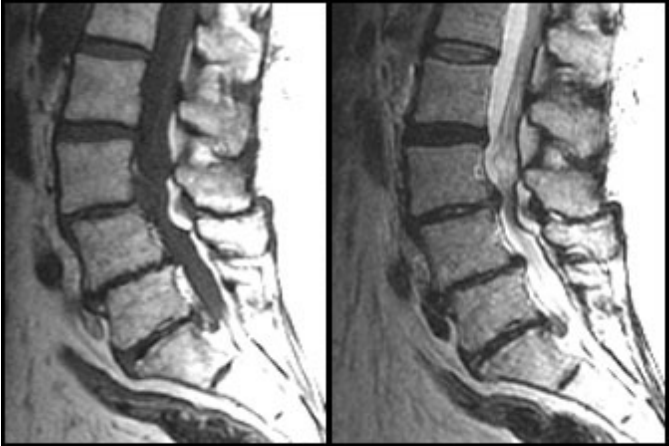


## When is Imaging Helpful for Patients with Back Pain?

Since the lifetime prevalence of low back pain is about eighty percent, it is hardly surprising that back pain is one of the most common reasons for patients to seek medical care. However, in the vast majority of cases, acute back pain (duration less than three months) is a self-limited condition that resolves with analgesic treatment and activity modification. In more than 80% of cases of back pain (Table 1) imaging will not affect treatment. However, it may lead to unnecessary additional testing due to the discovery of incidental benign lesions and nonspecific degenerative processes that may also occur in asymptomatic individuals.

In a recent study of patients with low back pain who had been referred for radiographic evaluation, only 3.7% went on to have surgery. However, the rate of surgeries performed on those who had been randomly assigned to MRI was double that of those who were assessed with plain film radiography. Furthermore, there was no difference in the outcome (functional disability and pain) in these two groups.

Nevertheless, low back pain will sometimes reflect a more serious condition than uncomplicated lumbar strain or sprain. The challenge is to identify red flags that would distinguish patients who should have a



**Figures A and B:** In a 72 year old patient with intermittent low back pain, MR images of the lumbar spine show multi-level abnormalities, such as severe spinal stenosis at L3-4 and disk herniation at L5-S1, that are far more impressive than the degree of symptoms.

more intensive work-up. The American College of Radiology has put substantial effort into the development of criteria that may justify further evaluation of patients with imaging (Table 2).

Table 1. Pretest Probability of Disorders that Cause Low Back Pain	
Lumbar strain or sprain	70%
Degenerative processes	10%
Herniated disc	4%
Osteoporotic compression fracture	4%
Spinal stenosis	3%
Spondylolisthesis	2%
Traumatic fracture	<1%
Ankylosing spondylitis	0.3%
Metastatic cancer	0.7%
Spinal infections	0.1%
Non-spinal causes	2%

Table 2. Indications for Further Evaluation by Imaging*
Recent significant trauma
Unexplained weight loss
Unexplained fever
Immunosuppression
History of Cancer
IV drug use
Prolonged use of corticosteroids
Osteoporosis
Age > 70
Duration longer than 3 months

\*From American College of Radiology Criteria

## Imaging Modalities for the Spine

Conventional radiography may be sufficient as a screening tool in the setting of trauma, prolonged steroid use, and osteoporosis in elderly patients because it can show vertebral compression fractures. Other imaging modalities may be warranted in the setting of suspected malignancy or infection, even if plain radiographs are negative. In patients with low back pain, the most common clinical indications for advanced imaging include radiating pain (radiculopathy, sciatica) or symptoms of nerve root compression due to cauda equina syndrome (bilateral leg weakness, urinary retention and saddle anesthesia), often reflecting disc herniation and/or spinal stenosis.

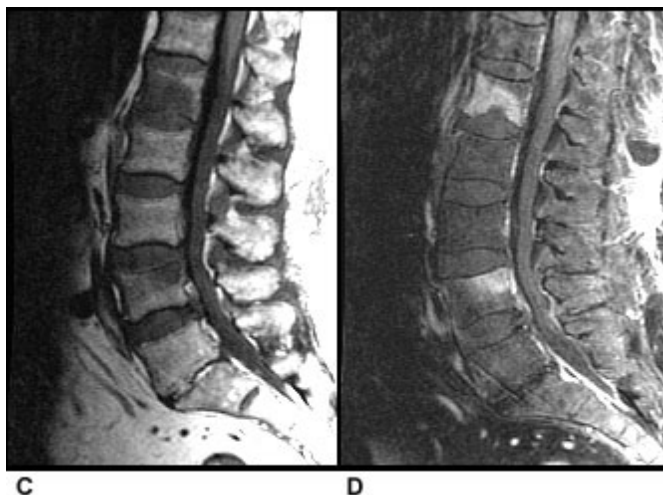
Although the appropriate selection of imaging modality can be challenging, MRI is usually the modality of choice. MRI is superior to CT for the depiction of disc abnormalities and bone marrow lesions, although CT can improve the assessment of cortical bone and, therefore, better delineate some fractures. MRI with or without contrast (gadolinium) enhancement reliably demonstrates vertebral infections and malignancy. MRI has taken over the role of isotope bone scan in the spine, but the bone scan remains important when a survey of the entire skeleton is necessary.

If MRI is contraindicated, isotope bone scan and/or CT may be substituted when there is a suspicion of infection or malignancy. In the case of radiating pain or cauda equina syndrome, CT myelography is effective but requires lumbar puncture for the injection of iodinated contrast. When other studies fail to localize the source of pain, image-guided injections, such as nerve root block or facet block, may have diagnostic value.

### Scheduling

For further questions on imaging for back pain and image-guided treatments (e.g. steroid injections, vertebroplasty), please contact [Dr. William Palmer](#), MGH Department of Radiology, at 617-726-7719 or visit [www.mghbackpain.org](http://www.mghbackpain.org).

For general information regarding MGH Radiology services and locations, please contact [Kristen Dean](#) at 617-724-4902.



**Figures C and D:** In a 52 year old patient with known lung carcinoma, MR images show two focal lesions (L1 and L4) that enhance densely after contrast administration. Radiographs were normal in appearance. Back pain was the first indication of metastatic disease.

### Further Information

If emergency imaging for back pain is warranted, the patient should be sent to the Emergency Department at MGH, where radiography, MRI, or CT will be performed. In other cases, imaging can be performed at MassGeneralWest in Waltham, Mass General Imaging in Chelsea or the main MGH campus. It can be ordered online via the Radiology Order Entry (ROE) System <http://mghroe/> or by calling 4-XRAY (617-724-9729). Results are made available to physicians online within 24-48 hours.

## References

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