

Lumbar spine MRI provides valuable information on the underlying causes of lower back pain (LBP), one of the most common causes of physician visits in the United States.^[1] The high-contrast and high-spatial resolution of this diagnostic technique, achieved without the use of ionizing radiation, makes MRI one of the best imaging techniques for the investigation of LBP.^[2]

However, MRI use is typically restricted to patients suspected of serious underlying conditions, such as possible malignancy, infection, compression fracture, cauda equina syndrome, or ankylosing spondylitis.^[3] Restricted use is supported by randomized clinical trials indicating that lumbar spine MRI does not improve the clinical outcomes of patients who do not show signs or symptoms of such serious conditions. MRI is also expensive and its use can produce irrelevant findings that cause emotional stress and the unnecessary utilization of medical resources, including surgery.

OPTIMIZED PROTOCOL

The Department of Radiology at Mount Sinai School of Medicine utilizes the following protocol to assess the lumbar spine:

Field Strength: 1.5T or 3.0T

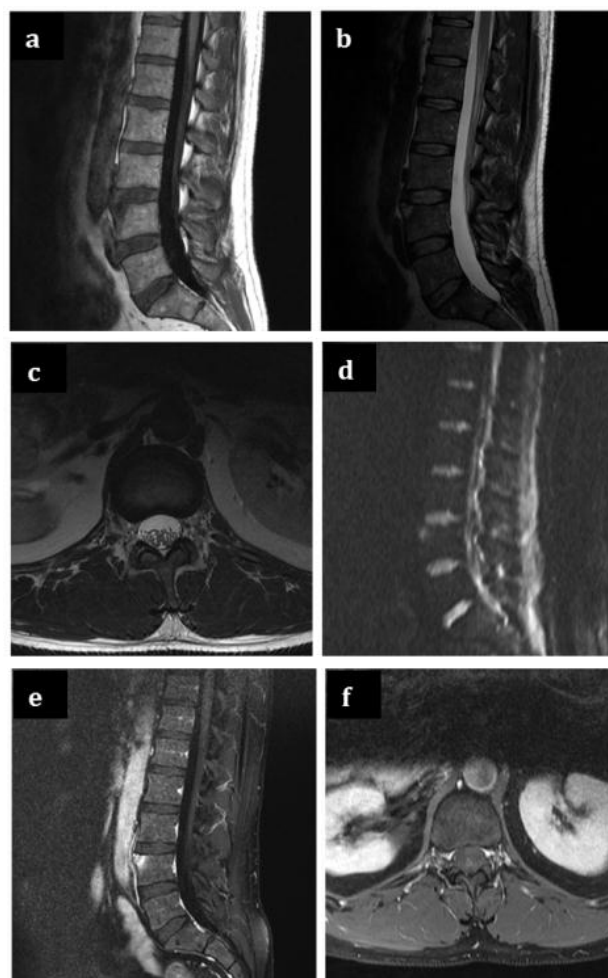
PRECONTRAST SERIES

- Multiplanar localizer
- Sagittal T1 FLAIR (bone marrow, ligaments, and soft tissue)
- Sagittal T2 FRFSE (spinal cord and CSF)
- Sagittal DWI
- Axial T2 FRFSE

CONTRAST (IF INDICATED FOR SUSPECTED MASS, VASCULAR CONDITION, OR INFECTION)

- Injection dose: 0.1 mmol/kg body weight
- Sagittal T1 FLAIR (fat suppressed)
- Axial T1 FLAIR (fat suppressed)

The following images were obtained during a 20-minute L-spine exam completed using a GE Discovery™ MR750 3.0T scanner (GE Healthcare, Waukesha, WI): (a) sagittal T1 FLAIR, (b) T2-weighted image, (c) axial T2-weighted image, (d) diffusion-weighted image, (e) sagittal post-contrast T1 FLAIR, and (f) axial post-contrast T1 FLAIR. Note the abnormal appearance at the anterior portion of L4. *Images courtesy of Lawrence Tanenbaum, MD, Mt. Sinai School of Medicine*



References

1. Reeder SB. Contrast media for liver MRI: which one to choose? Program and abstracts of ISMRM 2011; May 7-13, 2011; Montreal, Quebec, Canada.
2. Ringe KI, Husarik DB, Sirlin CB, Merkle EM. Gadaxetate disodium-enhanced MRI of the liver: part 1, protocol optimization and lesion appearance in the noncirrhotic liver. *AJR Am J Roentgenol.* 2010;195:13-28.
3. Cruite I, Schroeder M, Merkle EM, Sirlin CB. Gadaxetate disodium-enhanced MRI of the liver: part 2, protocol optimization and lesion appearance in the cirrhotic liver. *AJR Am J Roentgenol.* 2010;195:29-41.