

*Note: MRI is the preferred imaging modality for the following circumstances unless contraindicated or not tolerated by the patient (i.e., due to presence of ferrous metal in body, or severe anxiety) or unavailable.*

**I. Acute low back pain (onset within past 6 weeks): MRI without contrast unless specified otherwise**

\*Not Appropriate: uncomplicated acute (< 6 weeks) low back pain with or without suspected radiculopathy (no red flags) does not warrant the use of MRI, X-ray, CT, myelography or CT xylography, NUC Tc-99m bone scan with SPECT. Nonspecific lumbar disc abnormalities are commonly found in asymptomatic patients. (Chou, Qaseem et al. 2007) (American College of Radiology 2008).

- Progressive (objective) neurological signs
  - Progressive motor weakness present
- Suspect Cauda Equina syndrome (either of the following)
  - Bilateral neurologic signs and symptoms
  - Acute bladder or bowel dysfunction

\*ACR appropriateness recommendation ranks MRI without contrast highest (rating = 9). MRI with and without contrast (rating = 8) depends on clinical circumstances. Other methods: Myelography and postmyelography CT (rating = 6), CT with and without contrast (rating = 5)-may be indicated if MRI is confusing or contraindicated, x-ray, NUC Tc-99m bone scan with SPECT and x-ray myelography are rated < 5.
- Infection (any of the following): **MRI with and without contrast**
  - Fever
  - Suspicion of systemic or spinal infection
  - Immunosuppression (e.g., chronic steroid use)
  - IV drug use
  - Known bacteremia
  - Elevated sedimentation rate
- History or suspicion of cancer with new onset of LBP. Suspicion of cancer criterion can be met if any two of the following are present:
  - Unexplained weight loss,
  - Failure to improve after one month,
  - Age over 50.

\*ACP recommends plain radiography for unexplained weight loss, MRI or plain radiography if multiple risk factors present. ACR Guidelines for suspicion of cancer, infection or immunosuppression rate MRI without and with contract highest (rating = 8). CT without contrast (rating = 6)-useful if MRI is contraindicated or unavailable. Other imaging methods: use of x-ray, NUC Tc-99m bone scan whole body with optional targeted SPECT, myelography and postmyelography CT (appropriateness rating < 6 for these).
- Low velocity trauma (e.g., fall from height or struck by object) OR osteoporosis, AND/OR age >70 years
  - \*ACP Guideline recommends: if vertebral compression fracture is suspected due to history of osteoporosis, use of steroids, or age ≥ 70 plain radiography should be completed prior to MRI.
  - Vertebral compression fracture present on plain radiography
  - Other fractures

\*For low velocity trauma, ACR Guidelines do not support use of NUC Tc-99m bone scan with SPECT, MRI with and without contrast, myelography and postmyelography CT, or x-ray myelography (appropriateness ratings < 5 for these)

**II. Subacute Low back pain >6 weeks: MRI without contrast**

At least 6 weeks medical/conservative treatment and:

- Any of the criteria under acute low back pain met
- OR
- Suspected radiculopathy with (all 3 present):
  - Leg pain is > than back pain
  - Pain present in nerve root distribution
  - Positive straight leg raising test < 45° OR positive crossed straight leg raising test
- OR
- Motor weakness or sensory loss in a radicular distribution
- OR
- EMG/NCS consistent with radiculopathy

\*ACP recommendation: consider EMG/NCS testing if symptoms > 1 month. For suspected radiculopathy, ACR Guidelines rate MRI without contrast as most appropriate. CT without contrast may be useful if MRI is not available or contraindicated. MRI with and without contrast may be indicated if noncontrast MRI is nondiagnostic or indeterminate. MRI is preferred over myelography and postmyelography CT, but may be indicated if MRI is nondiagnostic. In some circumstances (facet arthropathy, stress fracture and spondylolysis) NUC Tc-99m bone scan with SPECT may be useful. Least appropriate x-ray (appropriateness rating 2).

**III. A. Chronic low back pain (> 3 months) with no prior MRI of lumbar spine: MRI without contrast**

- Any of the criteria under subacute low back pain (II above)
- Suspicion of substantial spinal stenosis on another imaging procedure

**B. Chronic low back pain (> 3 months) with prior MRI of lumbar spine: MRI without contrast**

- Objective worsening of neurological status by physical exam OR electrodiagnostic testing
- Patient is considered a candidate for spine surgery, (one of the following)
  - Progressive changes in objective neurological findings
  - At least 1 year since last lumbar MRI (without objective change in neurological signs)

\* ACR Guidelines rate MRI without contrast as most appropriate. CT without contrast may be useful if MRI is not available or contraindicated. MRI with and without contrast may be indicated if noncontrast MRI is nondiagnostic or indeterminate. MRI is preferred over myelography and postmyelography CT, but may be indicated if MRI is nondiagnostic. In some circumstances (facet arthropathy, stress fracture and spondylolysis) NUC Tc-99m bone scan with SPECT may be useful. Least appropriate x-ray (appropriateness rating 2).

- Prior lumbar surgery (one of the following)
  - Objective and/or new or worsening neurological signs
  - Plain radiography OR clinical findings suggest new adverse effects of surgery

**\*Looking for epidural scarring**

\*ACP appropriateness rates MRI with and without contrast highest (rating =8), CT without contrast (rating=6) may be indicated in postfusion patients or when MRI is contraindicated or indeterminate. Other methods rated lower: MRI without contrast (rating=6) as contrast is often necessary, myelography and postmyelography CT (rating = 5, x-ray (rating = 5)-flex/extension may be useful, NUC Tc-99m bone scan with SPECT (rating=5)-helps detect and localize pseudoarthrosis, x-ray myelography (rating = 2).

**IV. Indication not listed: provide clinical justification**

Indications here should be well documented. For example, while the vast majority of true radiculopathy cases would meet the criteria, specific syndromes (lateral stenosis, L1-L3 syndromes) may only meet some of these criteria. In these cases, clinical correlation should be clearly documented.

**References**

- American College of Radiology (2008). ACR appropriateness criteria: low back pain. Available at: [http://www.acr.org/SecondaryMainMenuCategories/quality\\_safety/app\\_criteria/pdf/ExpertPanelonNeurologicImaging/LowbackPainDoc7.aspx](http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonNeurologicImaging/LowbackPainDoc7.aspx)
- Chou, R., A. Qaseem, et al. (2007). "Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society." Ann Intern Med 147(7): 478-91.