

Measure Title	X-RAY PRIOR TO MRI OR CT SCAN FOR LOWER BACK PAIN		
Disease State	Back pain	Indicator Classification¹	Utilization
Strength of Recommendation²	A		
Physician Specialties	Family Practice, Gerontology, Internal Medicine, Neurological Surgery, Neurology, Orthopedic Surgery, Physical Medicine and Rehabilitation, Rheumatology		
Clinical Rationale	<p>Disease Burden</p> <ul style="list-style-type: none"> • In 1998, total health care expenditures for U.S. patients with back pain were \$90.7 billion of which \$26.3 billion was incurred specifically treating back pain. Additionally, individuals with back pain incurred 60% higher health care costs per capita.[1] • Examination of Medicare data from 1996 to 1997 indicated that rates of advanced spinal cord imaging vary 5.5-fold across all geographic regions and account for 22% of overall spine surgery rates.[2] • The use of MRI for patients with low back pain is increasing. Between 1987 and 1990, MRI utilization increased 3.4-fold. As a consequence of this increased imaging, costs rose \$70-\$170 million.[3] <p>Reason for Indicated Intervention or Treatment</p> <ul style="list-style-type: none"> • Early or frequent use of advanced imaging of the spine, CT or MRI, is discouraged because disk and other abnormalities are common among asymptomatic adults and the predictive value of such tests has not been proved. [4-7] • Guidelines for the treatment of low back pain recommend conservative treatment and consider imaging studies to be of less value than proper physical examination and a review of the patient's history. However, X-rays are recommended as the first line diagnostic tool when the history suggests spinal disease. In typical patients with lower back pain or radiculopathy, MR has not been found to be of value for the planning of conservative care [7-10] • MR imaging of the spine, on the other hand, has been shown to have little clinical benefit in comparison to X-rays and to increase the number of surgical procedures performed.[2, 11] Also, in comparison to X-rays, the use of MRI to diagnose cancer is ten times more expensive.[12] <p>Evidence supporting Intervention or Treatment</p> <ul style="list-style-type: none"> • A comparison of the use of MRI to plain radiograph in a randomized, controlled trial of 380 patients over the age of 18 whose primary doctor had ordered that their low back pain be evaluated by radiograph found that nearly identical functional and pain outcomes resulted for patients regardless of the imaging done. However, MRI imaging did lead to higher numbers of surgical procedures and hence, as suggested by the study's authors, also led to higher costs of care for these patients.[11] • Swedlow et al. retrospectively examined two groups of physicians reimbursed by the California Workers Compensation program to understand their referral practices. This comparative study found that physicians tended to favor imaging techniques like MRI when they owned or had an interest in the imaging facility, and that in 38% of these 		

- cases, the MRI was deemed to be medically unnecessary compared to only 28% of cases when the physician did not have a similar interest.[13]
- A review of a random 5% sample of Medicare's National Claims History Part B files showed that rates of advanced spinal imaging accounted for 22% of the variability in overall spine surgery rates and 14% of the variability in lumbar stenosis surgery rates leading the study's authors to conclude that a significant proportion of the variation in rates of spine surgery can be explained by differences in the rates of advanced spinal imaging.[2]
 - A meta-analysis of literature surrounding low back imaging determined that X-rays are an appropriate diagnostic tool when the back pain is potentially complicated by metastatic cancer, fracture, and ankylosing spondylitis.[9]
 - Alternatively, MRI was found to be most useful in few (approximately 7%) of cases of low back pain. These include arachnoiditis, spinal stenosis, osteomyelitis, disc space infection, malignant infiltration of the bone marrow, and spinal dysraphism.[4, 9]
 - A systematic review published in the Annals of Internal Medicine suggests that first line MRI use is indicated in patients with a history suggestive of lumbar spinal stenosis, neurological deficit, radiculopathy with or without urinary or fecal retention or incontinence, saddle anesthesia, or abscesses.[9]
 - MR imaging of asymptomatic patients has shown that many individuals exhibit signs of disk trauma without back pain. For instance, in one study of 98 asymptomatic patients given a back MRI, only 36% exhibited normal disks at all levels.[5] In a review of 4 studies looking at MRI results for asymptomatic individuals ranging in average age from 35 to more than 60 years, rates of many back problems occurred at very high average rates, including: herniated disks (32%), bulging disks (58%), degenerative disks (71%), and stenosis (10%).[4]
 - A cost-estimate of different strategies for identifying cancer using Medicare data and evidence-based prevalence rates found that if MRI alone were used to diagnose cancer when a patient's history suggests this as a possible cause of low back pain, then the cost per cancer found would be \$49,814 as opposed to \$5,283 if a conservative strategy of ESR and X-ray were first used to identify potential follow-up cases.[12]

Clinical Recommendations

- The Agency for Healthcare Research and Quality (AHRQ) has not issued updated guidelines, but instead still endorses the Agency of Health Care Policy and Research (AHCPH) guidelines on the treatment of acute low back pain in adults recommend conservative treatment. In cases where a patient's back pain is not improving after 4 to 6 weeks, or when patients show signs indicating complicated back pain, plain X-rays are recommended. Complications are defined by the following red flags: age greater than 50 years, prior cancer history, unexplained weight loss, pain lasting more than one month, recent significant trauma, a history of prolonged corticosteroid use, osteoporosis, or age greater than 70 years when cancer and spinal disease are ruled out.[8] The American College of Radiology (ACR) guidelines consider patients >70 as an automatic complicated case, rather than >50 listed above. ACR adds the following red flags: unexplained fever, immunosuppression, IV drug use, and mild trauma among those >50.[13]
- The American Academy of Family Physicians suggests using a

conservative course of management for low back pain, citing evidence that radiographs and laboratory tests are generally unnecessary, except in cases where a serious cause is suspected (infection, malignancy, rheumatologic diseases and neurologic disorders). The current recommendation is two or three days bed rest for patients with acute radiculopathy. The treatment should be reassessed in patients who do not return to normal activity within four to six weeks.[14]

Source	Health Benchmarks, Inc.
Denominator	Continuously enrolled members ages 18 years and older by the end of the measurement year, who, received a diagnosis of lower back pain and underwent an MRI or CT scan of the lumbar spine during the measurement year.
Denominator Exclusion	Members with a diagnosis of infection, persistent neurologic deficit, spinal stenosis, epidural abscess, anterior spinal cord infarct, tuberculosis, or pregnancy on the same date of service for the MRI or six months prior or members whose back pain diagnosis and MRI/CT scan occur on the same date of service.
Numerator	Members who had a radiograph of the spine in the six months prior to the index CT or MRI scan of the spine.
Interpretation of Score	High score implies better performance.
Physician Attribution	All physicians the patient saw from six months prior to the MRI/CT through to the date of the MRI/CT. To be included, the physician must also have diagnosed the patient with lower back pain or injury as defined in the denominator sometime in the six months prior to the MRI/CT.
External Files Required for Analysis	None
References	<ol style="list-style-type: none"> 1. Luo, X., et al., <i>Estimates and patterns of direct health care expenditures among individuals with back pain in the United States</i>. Spine, 2004. 29(1): p. 79-86. 2. Lurie, J.D., N.J. Birkmeyer, and J.N. Weinstein, <i>Rates of advanced spinal imaging and spine surgery</i>. Spine, 2003. 28(6): p. 616-620. 3. Ackerman, S.J., et al., <i>Trends in diagnostic imaging for low back pain: has MR imaging been a substitute or add-on?</i> Radiology, 1997. 203(2): p. 533-8. 4. Deyo, R.A. and J.N. Weinstein, <i>Primary care - Low back pain</i>. New England Journal Of Medicine, 2001. 344(5): p. 363-370. 5. Jensen, M.C., et al., <i>Magnetic resonance imaging of the lumbar spine in people without back pain</i>. N Engl J Med, 1994. 331(2): p. 69-73. 6. Borenstein, D.G., et al., <i>The Value of Magnetic Resonance Imaging of the Lumbar Spine to Predict Low-Back Pain in Asymptomatic Subjects: A Seven-Year Follow-up Study</i>. J Bone Joint Surg Am, 2001. 83(9): p. 1306-1311. 7. Modic, M.T., et al., <i>Acute low back pain and radiculopathy: MR imaging findings and their prognostic role and effect on outcome</i>. Radiology, 2005. 237(2): p. 597-604. 8. <i>Acute low back problems in adults: assessment and treatment</i>. Agency for Health Care Policy and Research. Clin Pract Guidel Quick Ref Guide Clin,

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¹ **Indicator Classification** (Adapted from Health Plan Employer Data Information Set (HEDIS®) technical specifications)

Diagnosis	Measures applicable to patients receiving diagnostic workups for a symptom or condition that delineate appropriate laboratory or radiological testing to be performed (e.g. evaluation of thyroid nodule; pregnancy test in patients with vaginal bleeding or abdominal pain)
Effectiveness of Care	
Prevention	Measures applicable to asymptomatic individuals that are designed to prevent the onset of the targeted condition (e.g. immunizations).
Screening	Measures applicable to asymptomatic patients who have risk factors or pre-clinical disease, but in whom the condition has not become clinically apparent (e.g. pap smears; screening for elevated blood pressure).
Disease Management	Measures applicable to individuals diagnosed with a condition that are part of the treatment or management of the condition (e.g. cholesterol reduction in patients with diabetes; radiation therapy following breast conserving surgery; appropriate follow-up after acute event).
Medication Monitoring	Measures applicable to patients taking medications with narrow therapeutic windows and / or potential preventable significant side effects or adverse reactions (e.g. thyroid stimulating hormone (TSH) testing after levothyroxine dose change; hepatic enzyme monitoring for patients using antimycotic pharmacotherapy)
Medication Adherence	Measures applicable to patients taking medications for chronic conditions that are designed to assess patient adherence to medication (e.g. adherence to lipid lowering medication).
Utilization	Measures applicable to patients receiving treatment for a symptom or condition that advocate appropriate utilization of laboratory and pharmaceutical resources (e.g. conservative use of imaging for low back pain; inappropriate use of antibiotics for viral upper respiratory infection).

² Strength of Recommendation

Strength of Recommendation Based on a Body of Evidence

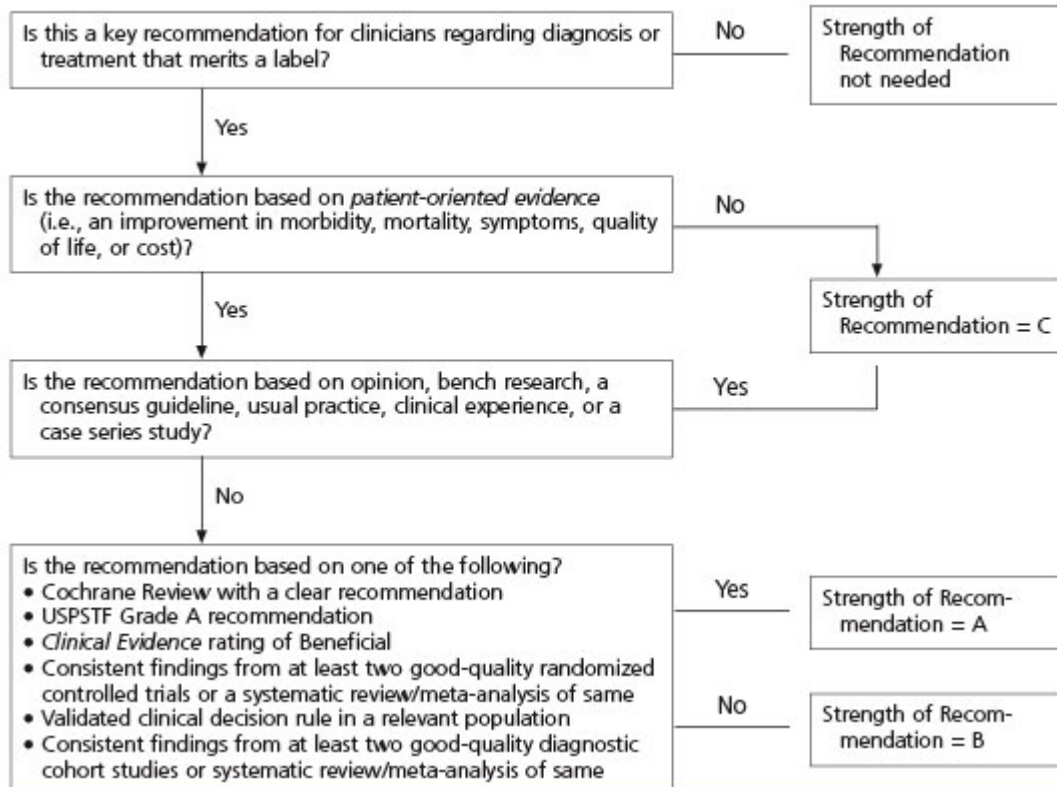


FIGURE 2. Algorithm for determining the strength of a recommendation based on a body of evidence (applies to clinical recommendations regarding diagnosis, treatment, prevention, or screening). While this algorithm provides a general guideline, authors and editors may adjust the strength of recommendation based on the benefits, harms, and costs of the intervention being recommended. (USPSTF = U.S. Preventive Services Task Force)