Client: HMSA: PQSR 2009

Measure Title: X-RAY PRIOR TO MRI OR CAT SCAN IN THE EVALUATION OF LOWER BACK PAIN

Disease State: Back pain

Indicator Classification: Utilization

Strength of Recommendation: B

Organizations Providing Recommendation:
- American Academy of Family Physicians
- American Academy of Neurology
- American College of Physicians
- Agency of Health Care Policy and Research
- American Pain Society
- Institute for Clinical Systems Improvement

Clinical Intent: To ensure that an x-ray is conducted prior to an MRI for eligible members diagnosed with lower back pain.

Physician Specialties (suggested): Refer to PQSR 2009 Clinical Measures by Specialty.

Disease Burden:
- According to the 2002 National Ambulatory Medical Care Survey, low back pain was the most frequent cause of pain reported by patients seeking outpatient medical care. Approximately 26% of patients surveyed reported experiencing low back pain within the last 3 months, and 2% of primary diagnoses for office visits during that year were for low back pain.[1]
- Total costs of low-back pain exceed $100 billion per year, [2] of which greater than $20 billion is from direct costs.[3] Individuals with back pain incurred 60% higher health care costs per capita than those without back pain.[3]
- 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.[4]
- 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.[5]

Reason for Indicated Intervention or Treatment:
- 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 proven.[6-9]
• 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, MRI has not been found to be of value for the planning of conservative care.[9-12]

• MRI 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.[4, 13] Also, in comparison to X-rays, the use of MRI to diagnose cancer is ten times more expensive.[14]

Evidence Supporting Intervention or Treatment

• Several studies demonstrate that the routine use of MRI for patients with simple low back pain cannot be recommended. MRIs do not improve clinical outcome, may increase costs, and do not identify any occult serious pathology.[13, 15, 16]

• 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 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.[13]

• 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.[17]

• 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.[4]

• 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,
Recommendations

- 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.[6, 11]
- 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.[11]
- MRI 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.[7] 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%).[6]
- 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.[14]

Clinical Recommendations

- A recent joint guideline issued by the American College of Physicians and the American Pain Society states the following:
  - MRI or CT be used in patients who have severe or progressive neurologic deficits or are suspected of having a serious underlying condition (such as vertebral infection, cauda equina, or cancer with impending spinal cord compression), (strong recommendation, moderate-quality evidence) and only if they are potential candidates for surgery of epidural steroid injection (strong recommendation, moderate-quality evidence).[18]
  - Plain radiography is recommended for initial evaluation of possible vertebral compression fracture.
  - Plain radiography is a reasonable initial option for persistent low back pain for more than 1 to 2 months with no symptoms suggesting radiculopathy or spinal stenosis.
- A 2006 guideline from the Institute for Clinical Systems Improvement states:
CT or MRI is indicated in the following situations:
- Major or progressive neurologic deficit
- Cauda Equina Syndrome (loss of bowel or bladder control or saddle anesthesia)
- Progressively severe pain and debility despite conservative therapy
- Severe or incapacitating back or leg pain
- Clinical or radiological suspicion of neoplasm

Use of MRI alone is indicated in:
- Clinical or radiological suspicion of infection
- Trauma
- Severe low back pain or radicular pain, unresponsive to conservative therapy, with indications for surgical intervention

Use of CT alone is indicated in:
- Bone tumors (to detect or characterize)
- Severe or incapacitating back or leg pain (e.g., requiring hospitalization, precluding walking, or significantly limiting the activities of daily living)[19]

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.[20]

The Quality Standards Subcommittee of the American Academy of Neurology recommends the following regarding use of MRI in lower back pain: “Nonsurgical therapy is recommended before the application of further diagnostic imaging procedures in adult patients with [lower back pain] of less than 7 weeks duration when, after clinical evaluation by history and physical examination (1) the most likely diagnosis is confined to symptomatic low back pain alone, (2) there is no evidence of motor, sensory, reflex, sphincter or autonomic deficit, and (3) there is no evidence of significant trauma, infection or neoplasia. After 7 weeks, patients still symptomatic may undergo further clinical investigation”. Class II evidence.[21]
measurement year.

**Denominator Exclusion**

| Denominator Exclusion Definition | Members with a diagnosis of infection, persistent neurologic deficit, spinal stenosis, epidural abscess, anterior spinal cord infarct, discitis, abnormal weight loss, long-term steroid use, disc herniation, sclerosis, tuberculosis, intravenous drug use or pregnancy on the index date or during the 12 months prior. Members who have a diagnosis of cancer, HIV, or rheumatoid arthritis any time in their history. Additionally, members whose back pain diagnosis and MRI or CT scan occur on the same date of service. |

**Numerator**

| Numerator Definition | Members who had a radiograph of the spine in the 0-12 months prior to the index date (exclusive of the index date). |

**Physician Attribution**

| Physician Attribution Description | Score all physicians (in the selected specialties) who diagnosed the patient with lower back pain or injury (as defined in denominator criterion [A]; use any diagnosis field) during the 0-12 months prior to the index date (including the index date). |

**References**


