

HEALTH EVIDENCE REVIEW COMMISSION (HERC)

COVERAGE GUIDANCE: ADVANCED IMAGING FOR LOW BACK PAIN

DATE: 08/09/2012

HERC COVERAGE GUIDANCE

In patients with non-specific low back pain and an absence of “red flag” conditions:

- 1) imaging (e.g. x-ray, CT, or MRI) should not be covered, and
- 2) thermography, surface electromyography should not be covered.

If patients have persistent (> 1 month) low back pain and signs or symptoms of radiculopathy or spinal stenosis, appropriate imaging should be covered (MRI preferred, CT second choice) **only if** the patient is a potential candidate for surgery or epidural steroid injection (for suspected radiculopathy).

If patients have severe or progressive neurologic deficits, or clinicians suspect a serious underlying condition (e.g. cancer or infection) prompt workup with MRI (first choice) or CT should be covered.

Note: A table outlining potentially serious conditions (“Red Flags”) and recommendations for initial diagnostic work-up is provided at the end of the evidence summary. This guidance does not address trauma patients.

RATIONALE FOR GUIDANCE DEVELOPMENT

The HERC selects topics for guideline development or technology assessment based on the following principles:

- Represents a significant burden of disease
- Represents important uncertainty with regard to efficacy or harms
- Represents important variation or controversy in clinical care
- Represents high costs, significant economic impact
- Topic is of high public interest

Coverage guidance development follows to translate the evidence review to a policy decision. In addition to an evidence-based guideline developed by the Evidence-based Guideline Subcommittee and a health technology assessment developed by the Health Technology Assessment Subcommittee, coverage guidance may utilize an existing evidence report produced in the last 5 years by the Agency for Healthcare Research and Quality, the Medicaid Evidence-based Decisions Project or the Washington Health Technology Assessment Program.

EVIDENCE SOURCES

Livingston, C., Little, A., King, V., Pettinari, C., Thielke, A., Vandegriff, S., & Gordon, C. (2012). *State of Oregon Evidence-based Clinical Guidelines Project. Advanced imaging for low back pain: A clinical practice guideline based on the joint practice guideline of the American College of Physicians and the American Pain Society (Diagnosis and treatment of low back pain)*. Salem: Office for Oregon Health Policy & Research. Retrieved from <http://www.oregon.gov/OHA/OHPR/HERC/Evidence-Based-Guidelines.shtml>

Chou, R, Fu, R, Carrino, J & Deyo, R. (2009). Imaging strategies for low-back pain: systematic review and meta-analysis. *The Lancet*, 373(9662): 463-472.

Chou, R, Qaseem, A, Owens, D, Shekelle, P for the Clinical Guidelines Committee of the American College of Physicians. (2011). Diagnostic imaging for low back pain: Advice for high-value health care from the American College of Physicians. *Annals of Internal Medicine*, 154(3), 181-189.

Chou, R., Qaseem, A., Snow, V., Casey, D., Cross, J.T., Jr., Shekelle, P., Owens, D.K.; Clinical Efficacy Assessment Subcommittee of the American College of Physicians; American College of Physicians; American Pain Society Low Back Pain Guidelines Panel. *Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society*. *Annals of Internal Medicine*. 2007; 147(7); 478-491. Retrieved from <http://www.annals.org/content/147/7/478.long>

The summary of evidence in this document is derived directly from these evidence sources, and portions are extracted verbatim.

SUMMARY OF EVIDENCE

Clinical Background

Low back pain is the fifth most common reason for all physician visits in the United States. Approximately one quarter of U.S. adults reported having low back pain lasting at least one whole day in the past three months, and 7.6% reported at least one episode

of severe acute low back pain within a 1-year period. Low back pain is also very costly. Total incremental direct health care costs attributable to low back pain in the U.S. were estimated at \$26.3 billion in 1998. In addition, indirect costs related to days lost from work are substantial, with approximately 2% of the U.S. work force compensated for back injuries each year.

Many patients have self-limited episodes of acute low back pain and do not seek medical care. Among those who do seek medical care, pain, disability, and return to work typically improve rapidly in the first month. However, up to one third of patients report persistent back pain of at least moderate intensity one year after an acute episode, and 1 in 5 report substantial limitations in activity. Approximately 5% of the people with back pain disability account for 75% of the costs associated with low back pain.

Many options are available for evaluation and management of low back pain. However, there has been little consensus, either within or between specialties, on appropriate clinical evaluation and management of low back pain. Numerous studies show unexplained, large variations in use of diagnostic tests and treatments. Despite wide variations in practice, patients seem to experience broadly similar outcomes, although costs of care can differ substantially among and within specialties.

Evidence Review

Recommendation 1: Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain (strong recommendation, moderate-quality evidence).

There is no evidence that routine plain radiography in patients with nonspecific low back pain is associated with a greater improvement in patient outcomes than selective imaging. In addition, exposure to unnecessary ionizing radiation should be avoided. This issue is of particular concern in young women because the amount of gonadal radiation from obtaining a single plain radiograph (two views) of the lumbar spine is equivalent to being exposed to a daily chest radiograph for more than one year. Routine advanced imaging (computed tomography [CT] or magnetic resonance imaging [MRI]) is also not associated with improved patient outcomes and identifies many radiographic abnormalities that are poorly correlated with symptoms but could lead to additional, possibly unnecessary interventions.

Plain radiography is recommended for initial evaluation of possible vertebral compression fracture in selected higher-risk patients, such as those with a history of osteoporosis or steroid use. Evidence to guide optimal imaging strategies is not available for low back pain that persists for more than one to two months despite standard therapies if there are no symptoms suggesting radiculopathy or spinal stenosis, although plain radiography may be a reasonable initial option (see recommendation 3 for imaging recommendations in patients with symptoms suggesting radiculopathy or spinal stenosis). Thermography, surface electromyography and electrophysiologic testing are not recommended for evaluation of nonspecific low back

pain, since systematic reviews of thermography and surface electromyography found inconsistent and inadequate evidence to support their use. While electrophysiology testing is often used when imaging and clinical exam findings are discordant or the diagnosis of radiculopathy or spinal stenosis is uncertain, no systematic reviews of its diagnostic accuracy have been identified.

Recommendation 2: Clinicians should perform diagnostic imaging and testing for patients with low back pain when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination (strong recommendation, moderate-quality evidence).

Prompt work-up with MRI or CT is recommended in patients who have severe or progressive neurologic deficits or are suspected of having a serious underlying condition (such as vertebral infection, the cauda equina syndrome, or cancer with impending spinal cord compression) because delayed diagnosis and treatment are associated with poorer outcomes. Magnetic resonance imaging is generally preferred over CT if available because it does not use ionizing radiation and provides better visualization of soft tissue, vertebral marrow, and the spinal canal. There is insufficient evidence to guide precise recommendations on diagnostic strategies in patients who have risk factors for cancer but no signs of spinal cord compression. Several strategies have been proposed for such patients, but none have been prospectively evaluated. Proposed strategies generally recommend plain radiography or measurement of erythrocyte sedimentation rate (a rate 20 mm/h is associated with 78% sensitivity and 67% specificity for cancer), with MRI reserved for patients with abnormalities on initial testing. An alternative strategy is to directly perform MRI in patients with a history of cancer, the strongest predictor of vertebral cancer. For patients older than 50 years of age without other risk factors for cancer, delaying imaging while offering standard treatments and reevaluating within 1 month may also be a reasonable option.

Recommendation 3: Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with MRI (preferred) or CT only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy) (strong recommendation, moderate-quality evidence).

The natural history of lumbar disc herniation with radiculopathy in most patients is for improvement within the first 4 weeks with noninvasive management. There is no compelling evidence that routine imaging affects treatment decisions or improves outcomes. For prolapsed lumbar disc with persistent radicular symptoms despite noninvasive therapy, discectomy or epidural steroids are potential treatment options. Surgery is also a treatment option for persistent symptoms associated with spinal stenosis.

Magnetic resonance imaging (preferred if available) or CT is recommended for evaluating patients with persistent back and leg pain who are potential candidates for invasive interventions—plain radiography cannot demonstrate discs or accurately show the degree of spinal stenosis. However, clinicians should be aware that findings on MRI or CT (such as bulging disc without nerve root impingement) are often nonspecific. Recommendations for specific invasive interventions, interpretation of radiographic

findings, and additional work-up (such as electrophysiologic testing) are beyond the scope of this guideline, but decisions should be based on the clinical correlation between symptoms and radiographic findings, severity of symptoms, patient preferences, surgical risks (including the patient's comorbid conditions), and costs and will generally require specialist input.

[\[Evidence Source\]](#)

Overall Summary

There is no evidence that routine plain radiography in patients with nonspecific low back pain is associated with a greater improvement in patient outcomes than selective imaging. Prompt work-up with MRI or CT is recommended in patients who have severe or progressive neurologic deficits or are suspected of having a serious underlying condition. Most patients with lumbar disc herniation with radiculopathy improve within the first 4 weeks with noninvasive management, and there is no compelling evidence that routine imaging affects treatment decisions or improves outcomes.

Potentially Serious Conditions (“Red Flags”) and Recommendations for Initial Diagnostic Work-up

Possible cause	Key features on history or physical examination	Imaging*	Additional studies*
Cancer	<ul style="list-style-type: none"> • History of cancer with new onset of LBP 	MRI	ESR
	<ul style="list-style-type: none"> • Unexplained weight loss • Failure to improve after 1 month • Age >50 years • Symptoms such as painless neurologic deficit, night pain or pain increased in supine position 	Lumbosacral plain radiography	
	<ul style="list-style-type: none"> • Multiple risk factors for cancer present 	Plain radiography or MRI	
Spinal column infection	<ul style="list-style-type: none"> • Fever • Intravenous drug use • Recent infection 	MRI	ESR and/or CRP
Cauda equina syndrome	<ul style="list-style-type: none"> • Urinary retention • Motor deficits at multiple levels • Fecal incontinence • Saddle anesthesia 	MRI	None
Vertebral compression fracture	<ul style="list-style-type: none"> • History of osteoporosis • Use of corticosteroids • Older age 	Lumbosacral plain radiography	None
Ankylosing spondylitis	<ul style="list-style-type: none"> • Morning stiffness • Improvement with exercise • Alternating buttock pain • Awakening due to back pain during the second part of the night • Younger age 	Anterior-posterior pelvis plain radiography	ESR and/or CRP, HLA-B27
Nerve compression/ disorders (e.g. herniated disc with radiculopathy)	<ul style="list-style-type: none"> • Back pain with leg pain in an L4, L5, or S1 nerve root distribution present < 1 month • Positive straight-leg-raise test or crossed straight-leg-raise test 	None	None
	<ul style="list-style-type: none"> • Radiculopathic symptoms present >1 month • Severe/progressive neurologic deficits (such as foot drop), progressive motor weakness 	MRI**	Consider EMG/NCV
Spinal stenosis	<ul style="list-style-type: none"> • Radiating leg pain • Older age • Pain usually relieved with sitting (Pseudoclaudication a weak predictor) 	None	None
	<ul style="list-style-type: none"> • Spinal stenosis symptoms present >1 month 	MRI**	Consider EMG/NCV

* Level of evidence for diagnostic evaluation is variable

** Only if patient is a potential candidate for surgery or epidural steroid injection

Red Flag: Red flags are findings from the history and physical examination that may be associated with a higher risk of serious disorders. CRP = C-reactive protein; EMG = electromyography; ESR = erythrocyte sedimentation rate; MRI = magnetic resonance imaging; NCV = nerve conduction velocity.

Extracted and modified from Chou R, Qaseem A, Snow V, et al: 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. 2007; 147:478-491.

PROCEDURE

Computed tomography of the spine
Magnetic resonance imaging of the spine

DIAGNOSES

Low back pain

APPLICABLE CODES

CODES	DESCRIPTION
ICD-9 Diagnosis Codes	
720.1	Spinal enthesopathy
720.2	Sacroiliitis, not elsewhere classified
721.3	Lumbosacral spondylosis without myelopathy
721.42	Spondylosis with myelopathy, lumbar region
721.5	Kissing spine
721.6	Ankylosing vertebral hyperostosis
721.7	Traumatic spondylopathy
721.8	Other allied disorders of spine
721.9	Spondylosis of unspecified site
722.1	Displacement of thoracic or lumbar intervertebral disc without myelopathy
722.2	Displacement of intervertebral disc, site unspecified, without myelopathy
722.32	Schmorl's nodes, lumbar region
722.39	Schmorl's nodes, other region
722.5	Degeneration of thoracic or lumbar intervertebral disc
722.6	Degeneration of intervertebral disc, site unspecified
722.70	Intervertebral disc disorder with myelopathy, unspecified region
722.72	Intervertebral disc disorder with myelopathy, thoracic region
722.73	Intervertebral disc disorder with myelopathy, lumbar region
722.80	Postlaminectomy syndrome, unspecified region
722.82	Postlaminectomy syndrome, thoracic region
722.83	Postlaminectomy syndrome, lumbar region
722.90	Other and unspecified disc disorder, unspecified region
722.92	Other and unspecified disc disorder, thoracic region
722.93	Other and unspecified disc disorder, lumbar region
724	Other and unspecified disorders of back
724.0	Spinal stenosis other than cervical
724.00	Spinal stenosis, unspecified region
724.01	Spinal stenosis, thoracic region
724.02	Spinal stenosis, lumbar region, without neurogenic claudication
724.03	Spinal stenosis, lumbar region, with neurogenic claudication
724.09	Spinal stenosis, other region
724.1	Pain in thoracic spine
724.2	Lumbago
724.3	Sciatica
724.4	Thoracic or lumbosacral neuritis or radiculitis, unspecified
724.5	Backache, unspecified

CODES	DESCRIPTION
724.6	Disorders of sacrum
724.7	Disorders of coccyx
724.70	Unspecified disorder of coccyx
724.71	Hypermobility of coccyx
724.79	Other disorders of coccyx
724.8	Other symptoms referable to back
724.9	Other unspecified back disorders
730.2	Unspecified osteomyelitis
732.0	Juvenile osteochondrosis of spine
733.0	Osteoporosis
737.2	Lordosis (acquired)
737.30	Scoliosis [and kyphoscoliosis], idiopathic
737.39	Other kyphoscoliosis and scoliosis
737.4	Curvature of spine associated with other conditions
737.8	Other curvatures of spine
737.9	Unspecified curvature of spine
738.4	Acquired spondylolisthesis
738.5	Other acquired deformity of back or spine
739.2	Nonallopathic lesions, thoracic region
739.3	Nonallopathic lesions, lumbar region
739.4	Nonallopathic lesions, sacral region
754.2	Congenital musculoskeletal deformities of spine
756.1	Congenital anomalies of spine
846	Sprains and strains of sacroiliac region
847.1	Sprain of thoracic
847.2	Sprain of lumbar
847.3	Sprain of sacrum
847.4	Sprain of coccyx
847.9	Sprain of unspecified site of back
ICD-9 Volume 3 (procedure codes)	
87.24	Other x-ray of lumbosacral spine
88.38	Other computerized axial tomography
88.93	X-ray, other and unspecified
CPT	
72131	CT lumbar spine; without contrast material
72132	CT lumbar spine; with contrast material
72133	CT lumbar spine; without and with contrast material
72148	MRI lumbar spine; without contrast material
72149	MRI lumbar spine; withcontrast material
72158	MRI lumbar spine; without and with contrast material
72100	X-ray lumbosacral spine; two or three views
72100	X-ray lumbosacral spine; minimum of four views
72114	X-ray lumbosacral spine; complete including bending views
72120	X-ray lumbosacral spine; bending views only minimum of four views
HCPCS Codes	
S3900	Surface electromyography

Note: Inclusion on this list does not guarantee coverage

Coverage guidance is prepared by the Health Evidence Review Commission (HERC), HERC staff, and subcommittee members. The evidence summary is prepared by the Center for Evidence-based Policy at Oregon Health & Science University (the Center). This document is intended to guide public and private purchasers in Oregon in making informed decisions about health care services.

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