in the clinic

# Low Back Pain




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in the clinic

Low back pain has a lifetime prevalence of nearly 80% and is the fifth most common reason for physician visits in the United States (1). It is also costly, accounting for a large and increasing proportion of health care expenditures without evidence of corresponding improvements in outcomes (2). Most low back pain is due to nonspecific musculoskeletal strain, and episodes generally resolve within days to a few weeks with self-care. Up to one third of patients, however, reports persistent back pain of at least moderate intensity 1 year after an acute episode, and 1 in 5 report substantial limitations in activity (3). Because low back pain is common, chronic, and can lead to substantial disability, it is important that physicians be proficient with its evaluation and management.

# Prevention

**Factors Associated with Low Back Pain or Disability Claims for Low Back Pain:**

- Work that requires heavy lifting; bending and twisting; or whole-body vibration, like truck driving
- Physical inactivity
- Obesity
- Arthritis or osteoporosis
- Pregnancy
- Age > 30 years
- Bad posture
- Stress or depression

## What factors are associated with the development of low back pain?

Factors associated with the development of low back pain include obesity, physical inactivity, occupational factors, and depression and other psychological conditions. Such strategies as maintenance of normal body weight and physical fitness and avoidance of activities that can injure the back should decrease the risk for low back pain, but direct evidence documenting the value of such interventions is not available.

It is important to keep in mind that back pain (the symptom), a health care visit for back pain, and work loss or disability due to back pain are not necessarily different aspects of the same construct. Symptom severity does not correlate well with utilization or functional outcome.

## Should clinicians advise patients about preventing low back pain?

In 2005, the U.S. Preventive Services Task Force concluded that the evidence was insufficient to recommend for or against the routine use of interventions in primary care settings to prevent low back pain in healthy adults (4). The Task Force noted that, although exercise has not been shown to prevent low back pain, regular physical activity has other proven health benefits.

## Are specific preventive measures effective in preventing low back pain at work?

People whose jobs require heavy lifting and other physical work are thought to be at greater risk for low back pain than people in less physically demanding occupations. Low back pain is a common cause of days lost from work and the need for workers' compensation. Studied approaches to prevent low back pain in the workplace include educational interventions and mechanical supports. Results regarding their effectiveness in the primary and secondary prevention of low back pain have generally not shown large benefits. A large randomized, controlled trial (RCT) of an educational program to prevent low back pain among mail carriers who did or did not have previous low back pain did not report any benefits (5). Similarly, a large trial in workers in physically demanding jobs did not report any benefits of a work-site prevention program (6), and another trial using education and lumbar supports also showed no reduction in low back pain compared with usual care (7). Furthermore, evidence is lacking that external back support, such as with a back brace or belt, provides benefit (8).

*A recent randomized trial compared use of a patient-selected lumbar support with no support for home care workers with a history of low back pain. Although patients in the support groups reported fewer days with low back pain, work absenteeism rates were high and statistically similar in both the intervention and control groups (9).*


1. Deyo RA, Mirza SK, Martin BI. Back pain prevalence and visit rates: estimates from U.S. national surveys, 2002. Spine. 2006; 31:2724-7. [PMID: 17077742]
2. Martin BI, Deyo RA, Mirza SK, et al. Expenditures and health status among adults with back and neck problems. JAMA. 2008;299:656-64. [PMID: 18270354]
3. Von Korff M, Saunders K. The course of back pain in primary care. Spine. 1996; 21:2833-7; discussion 2838-9. [PMID: 9112707]
4. U.S. Preventive Services Task Force. Primary care interventions to prevent low back pain in adults: recommendation statement. Am Fam Physician. 2005; 71:2337-8. [PMID: 15999872]
5. Daltroy LH, Iversen MD, Larson MG, et al. A controlled trial of an educational program to prevent low back injuries. N Engl J Med. 1997; 337:322-8. [PMID: 9233870]

Prevention... Regular exercise and maintenance of fitness may be helpful in preventing low back pain. Evidence is insufficient to support the use of any specific preventive interventions, including educational interventions, work-site prevention programs, or mechanical supports.

**CLINICAL BOTTOM LINE**

# Diagnosis

**What elements of history and physical examination should clinicians incorporate into the evaluation of low back pain?**

History and physical examination should aim to place the patient into 1 of 3 categories: nonspecific low back pain, back pain potentially associated with radiculopathy or spinal stenosis, or back pain potentially associated with another specific systemic or spinal cause. Table 1 shows the history and physical examination findings for different types of back pain.

When evaluating a patient with low back pain, clinicians should identify features that indicate a serious underlying cause, or radiculopathy, and psychosocial factors that could delay recovery. Key elements of the physical examination include checking for sensory loss, muscle weakness, or limited range

**Table 1. Common History and Physical Examination Features for Different Back Pain Causes**

| Disease | History | Physical Examination | Notes |
|---|---|---|---|
| Degenerative joint disease | Nonspecific | Nonspecific | Common radiological abnormalities that may or may not be related to symptoms |
| Degenerative disk disease with herniation | Sciatic pain | Impaired ankle or patella reflex; positive ipsilateral or crossed straight-leg–raise test; great toe, ankle, or quadriceps weakness; lower extremity sensory loss | Common cause of nerve root impingement and radicular symptoms |
| Spinal stenosis | Severe leg pain; pseudoclaudication; no pain when seated | Wide-based gait; abnormal Romberg test results; thigh pain after 30 seconds of lumbar extension | More common with advancing age, uncommon before age 50 y |
| Ankylosing spondylitis | Gradual onset; morning stiffness; improves with exercise; pain > 3 mo; pain not relieved when supine | Decreased spinal range of motion | Usual onset before age 40 y |
| Osteomyelitis or spinal abscess | Source of infection, such as urinary tract infection, skin infection, or history of intravenous drug abuse | Fever and localized tenderness | Can cause cord compression |
| Malignancy in the spine or surrounding structures | Weight loss or other symptoms of malignancy; known past or current cancer diagnosis; failure to improve after 4 wk; no relief with bed rest | Localized tenderness | Metastatic disease. Commonly from prostate, breast, and lung cancer; can cause cord compression; more common in patients > 50 y |
| Intra-abdominal visceral disease | Depends on affected viscera | Depends on affected viscera | Peptic ulcer, pancreatitis, nephrolithiasis, pyelonephritis, prostatitis, pelvic infection or tumor, and aortic dissection can cause back pain |
| Metabolic bone disease with or without compression fracture | Nonspecific pain; osteoporosis or osteoporosis risk factors; trauma; corticosteroid use | Localized tenderness if vertebral fracture | Best example is osteoporosis with compression fracture |
| Herpes zoster | Unilateral pain in distribution of dermatome | Unlilateral dermatomal rash | Most common in elderly or immune-compromised patients |
| Psychosocial distress | Symptoms do not follow a clear clinical or anatomical pattern; psychological and emotional distress | Physical examination findings that do not follow a clear clinical or anatomical pattern | Patients with psychosocial distress and low back pain are at high risk for poor outcomes |

**Classification of Low Back Pain by Duration**

Acute: Lasts <4 weeks
Subacute: Lasts 4–12 weeks
Chronic: Lasts >12 weeks

of motion in the legs and feet and characterizing the pain level.

### What serious underlying systemic conditions should clinicians consider as possible causes of low back pain?

Underlying systemic disease that causes back pain is rare but must be considered. Prevalence is 4% for compression fracture, less than 1% for nonskin cancer, 0.3% for ankylosing spondylitis, and 0.01% for infection (10).

Factors associated with cancer include history of cancer, unexplained weight loss, no relief with bed rest, pain lasting more than 1 month, and increased age.

Osteomyelitis should be considered if there is a history of intravenous drug use, urinary tract infection, or fever. Increased age, white race, trauma, or prolonged corticosteroid use are associated with compression fractures.

Patients with at least 4 of the following characteristics require further evaluation for ankylosing spondylitis: morning stiffness, decreased discomfort with exercise, onset of back pain before age 40, slow onset of symptoms, and pain persisting for more than 3 months. However, because of the low prevalence of ankylosing spondylitis, the positive predictive value of any of these characteristics is still very low.

The absence of any of these worrisome features is highly sensitive but not very specific for excluding patients with systemic illness. The presence of these features may indicate the need for further evaluation.

### Is the classification of low back pain by duration of symptoms clinically useful?

Classifying patients according to duration of low back pain (acute, subacute, or chronic) is useful because evidence does suggest different effectiveness of some therapies on the basis of symptom duration.

Although there is no strong evidence-based method for classifying duration of acute back pain, it is generally defined as back pain lasting less than 4 weeks. Usually the result of trauma or arthritis, acute low back pain is the most common type of low back pain. Most acute back pain resolves within 4 weeks with self care. Subacute low back pain lasts between 4 to 12 weeks and may require clinical intervention. Chronic back pain is defined as pain that lasts longer than 12 weeks. It is often progressive, and identifying a specific cause is often difficult. People with low back pain usually have at least 1 episode of recurrence and can develop "acute-on-chronic" symptoms.

### Is there a role for standardized low back pain assessment instruments in the evaluation of patients with low back pain?

Quantitative scales that gauge pain and function provide objective measures for judging response to therapy. Questions addressing pain, back-specific function, general health status, work disability, psychological status, and patient satisfaction can be used to assess the extent of work disability as a result of low back pain. Commonly used quantitative measures include the Roland–Morris modification of the Sickness Impact Profile and the Oswestry Disability Questionnaire (11, 12). Although a meaningful change is not precisely defined, a 2- to 3-point change on these instruments is a commonly proposed threshold (13, 14). These quantitative measures have been validated and are often used in research settings, but there are no data that their use in clinical settings improves patient outcomes.


6. IJzelenberg H, Meerding WJ, Burdorf A. Effectiveness of a back pain prevention program: a cluster randomized controlled trial in an occupational setting. Spine. 2007;32:711-9. [PMID: 17414902]
7. van Poppel MN, Koes BW, van der Ploeg T, et al. Lumbar supports and education for the prevention of low back pain in industry: a randomized controlled trial. JAMA. 1998; 279:1789-94. [PMID: 9628709]
8. Jellema P, van Tulder MW, van Poppel MN, et al. Lumbar supports for prevention and treatment of low back pain: a systematic review within the framework of the Cochrane Back Review Group. Spine. 2001;26:377-86. [PMID: 11224885]
9. Roelofs PD, Bierma-Zeinstra SM, van Poppel MN, et al. Lumbar supports to prevent recurrent low back pain among home care workers: a randomized trial. Ann Intern Med. 2007;147:685-92. [PMID: 18025444]
10. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? JAMA. 1992;268:760-5. [PMID: 1386391]
11. Fairbank JC, Couper J, Davies JB, et al. The Oswestry low back pain disability questionnaire. Physiotherapy. 1980; 66:271-3. [PMID: 6450426]
12. Roland M, Morris R. A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain. Spine. 1983;8:141-4. [PMID: 6222486]

## What factors should lead clinicians to suspect nerve root involvement?

When patients present with back and leg pain, nerve root involvement must be considered. Nerve root involvement can cause neurologic compromise at the level of the nerve root (common causes include lumbar disk herniation in patients under age 50 years and spinal stenosis in older patients) or the upper motor neuron (causes include tumor or central-disk herniation).

When upper motor neurons are involved, urgent specialist consultation is required (10). Signs and symptoms that suggest upper motor neuron involvement include bowel or bladder dysfunction, diminished perineal sensation, sciatica, sensory motor deficits, and severe or progressive motor deficits.

Patients with leg pain that is worse than back pain, a positive straight-leg–raising test, and unilateral neurologic symptoms in the foot are very likely to have a herniated disk with nerve root compression as the source. The most common sites for lumbar disk herniation are at L4–5 or L5–S1. Pain that radiates from the back through the buttocks to the legs (sciatica) is common, and the more distal the pain radiation, the more specific the symptom is for nerve root involvement. Other common symptoms of disk herniation include weakness of the ankle and great toe dorsiflexors, loss of ankle reflex, and sensory loss in the feet.

Symptoms of vascular claudication can be difficult to distinguish from spinal stenosis, and clinicians should consider vascular disease in patients with risk factors for cardiovascular disease before attributing symptoms to spinal stenosis.

## What psychosocial issues are important for clinicians to consider in evaluating patients with low back pain?

An important factor predicting the course of low back pain is the presence of psychosocial distress. Psychosocial distress is more common in patients with chronic low back pain, and attention to this distress may be beneficial to recovery. Clinicians should consider the following factors associated with poor outcomes in patients with low back pain: job dissatisfaction, depression, substance abuse, and desire for disability compensation.

*A cross-sectional study of workers in the general population concluded that such individual psychological factors as distress and such work place factors as work load were highly related to the development of back pain (15).*

*A cohort study of patients presenting to primary care providers with first-onset low back pain found that psychological factors were strongly associated with persisting symptoms at 3 months (16).*

## When should clinicians consider imaging studies for patients with low back pain?

Radiographic examinations are usually of limited use in patients with low back pain unless the history or physical examination suggests a specific underlying cause. X-ray findings correlate poorly with low back symptoms (17). Spinal imaging studies in asymptomatic individuals commonly reveal anatomical findings, such as bulging or herniated disks, spinal stenosis, annular tears, and disk degeneration, which may not be clinically relevant and can reduce the specificity of imaging tests (18). Thus, the demonstration of an anatomical abnormality should not automatically lead the clinician to assume that it is the cause of the pain.

Imaging is important, however, for detecting some causes of low back pain. The American College of Radiology has developed appropriateness

**Physical Examination Maneuvers that Suggest Herniated Disk**

Straight-leg–raising test:
Passive lifting of the affected leg by the examiner to an angle less than 60 degrees reproduces pain radiating distal to the knee.

Crossed straight-leg–raising test:
Passive lifting of the unaffected leg by the examiner reproduces pain in the affected (opposite) leg.


13. Childs JD, Piva SR, Fritz JM. Responsiveness of the numeric pain rating scale in patients with low back pain. Spine. 2005;30:1331-4. [PMID: 15928561]
14. Ostelo RW, de Vet HC. Clinically important outcomes in low back pain. Best Pract Res Clin Rheumatol. 2005; 19:593-607. [PMID: 15949778]
15. Linton SJ. Do psychological factors increase the risk for back pain in the general population in both a cross-sectional and prospective analysis? Eur J Pain. 2005;9:355-61. [PMID: 15979015]
16. Grotle M, Brox JI, Veierød MB, et al. Clinical course and prognostic factors in acute low back pain: patients consulting primary care for the first time. Spine. 2005;30:976-82. [PMID: 15834343]
17. Bigos SJ. Acute Low Back Problems in Adults. Clinical Practice Guideline no. 14. Rockville, MD: U.S. Department of Health and Human Services; 1994;(14):iii-iv, 1-25. AHCPR publication no. 95-0642 [PMID: 7987418]
18. Jarvik JG, Deyo RA. Diagnostic evaluation of low back pain with emphasis on imaging. Ann Intern Med. 2002; 137:586-97. [PMID: 12353946]


 

*Imaging is most useful when the pretest probability of underlying serious disease requiring surgical intervention is high.*

criteria for radiographic procedures in the evaluation of patients with low back pain, where were last updated in 2005 (Table 2) (19). These criteria are meant to guide clinicians' decision-making depending on careful consideration of each patient's clinical circumstances.

A 2007 guideline developed by the American College of Physicians and the American Pain Society recommends that clinicians not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain; that clinicians 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; and that they evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with magnetic resonance imaging (preferred) or computed tomography only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy). The guideline developers rated these recommendations as strong and based on moderate-quality evidence (20).

In summary, imaging is most useful when the pretest probability of underlying serious disease requiring surgical intervention is high. There is no consensus on when a negative result on plain radiographs should be followed by an advanced imaging study or when the physician should go directly to an advanced study. A negative plain film does not definitively exclude cancer or infection in someone at high risk for these conditions. For such persons, early advanced imaging may be appropriate. Of note, patients with low back pain often expect radiographic procedures.

*An RCT of routine radiography for patients with low back pain of at least 6 weeks in duration reported more patient satisfaction with their health care but worse pain and function scores (21).*

### Under what circumstances should clinicians consider electromyography and other laboratory tests?

Clinicians should reserve electromyography and nerve conduction tests for patients in whom there is diagnostic uncertainty about the relationship of leg symptoms to anatomical findings on advanced imaging. Electrophysiologic tests

**Table 2. American College of Radiology Appropriateness Criteria for Lumbar Spine Radiographic Procedures in Patients with Low Back Pain***

| Radiographic Procedure | Clinical Scenario | | | | | |
|---|---|---|---|---|---|---|
| | Uncomplicated LBP | Low-Velocity Trauma, Osteoporosis, or age >70 y | Suspicion of Cancer or Immunosupression | Radiculopathy | Past Lumbar Surgery | Cauda Equina Syndrome |
| X-ray | 2 | 6 | 5 | 3 | 5 | 3 |
| CT without contrast | 2 | 6 | 4 | 5 | 6 | 4† |
| MRI without contrast | 2 | 8 | 8 | 8 | 6 | 9 |
| MRI with and without contrast | 2 | 3 | 7 | 5 | 8 | 8 |
| Nuclear bone scan, targeted | 2 | 4 | 5 | 2 | 5 | 2 |
| X-ray myelography | 2 | 1 | 2 | 2 | 2 | 2 |
| CT myelography | 2 | 1 | 2 | 5 | 5 | 6 |

** How to use this table: If you are considering radiologic procedures for a patient with one of the clinical scenarios displayed in the table, choose the test or tests with the highest numeric appropriateness rating. If all tests have low appropriateness ratings, consider whether a radiologic procedure is likely to inform decision-making before proceeding with testing. Rating scale: 1 = least appropriate; 9 = most appropriate. CT = computed tomography; LBP = low back pain; MRI = magnetic resonance imaging.*

*† With and without contrast.*

can assess suspected myelopathy, radiculopathy, neuropathy, and myopathy. With radiculopathy or neuropathy, electromyography results might be unreliable in limb muscles until a patient has significant limb symptoms for more than 3 to 4 weeks, so testing should not be done in patients with a duration of symptoms less than 4 weeks.

**Diagnosis...** Clinical evaluation of patients with low back pain should focus on identification of features that indicate a potential serious underlying condition, radiculopathy, and psychosocial factors. Clinicians should classify low back pain as acute, subacute, or chronic because treatment options can differ with duration. Most patients with acute symptoms will not require imaging tests, which should be reserved for patients with a high pretest probability of serious underlying systemic illness, fracture, cord compression, or spinal stenosis or if surgery is being considered.

**CLINICAL BOTTOM LINE**

## Treatment

### What are reasonable goals for clinicians and patients for treatment of low back pain?

Most acute, nonspecific pain resolves over time without treatment. Controlling pain and maintaining function while symptoms diminish on their own is the goal for most individuals with acute low back pain. Clinicians should inform patients that back pain is common, that the spontaneous recovery rate is more than 50% to 75% at 4 weeks and more than 90% at 6 weeks, and that most people do not need surgery even with herniated disks.

Subacute or chronic low back pain can be difficult to treat, and exacerbations can recur over time. Patients should understand that the goal of therapy is to maintain function and manage psychosocial distress, even if it is not possible to achieve complete resolution of pain. The patient should be encouraged to take personal responsibility for the continued management and prevention of further exacerbations and chronicity. Functional outcome depends more on patient behavior than on medical treatments.

### What psychosocial factors influence recovery in patients with low back pain?

Psychosocial factors and emotional distress are stronger predictors of low back pain outcomes than either physical examination findings or severity and duration of pain (22–24). Assessment of psychosocial factors, such as depression, unemployment, job dissatisfaction, somatization disorder, or psychological distress, identifies patients who may have delayed recovery and could help target behavioral interventions, such as intensive multidisciplinary rehabilitation.

### What should clinicians advise patients regarding level of activity and exercise?

A wealth of evidence suggests that prolonged bed rest or inactivity is associated with worse outcomes for patients with acute, subacute, or chronic low back pain. Clinicians should encourage patients to maintain activity levels as near to normal as possible but advise against back-specific exercises while in acute pain. Although work might need to be modified on a short-term basis to accommodate patient recovery, most patients with nonspecific occupational low back pain can


19. ACR Appropriateness Criteria. Reston, VA: American College of Radiology; 2005. Accessed at www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria.aspx on 17 March 2008.
20. Chou R, Qaseem A, Snow V, et al. Clinical Efficacy Assessment Subcommittee of the American College of Physicians. 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; 147:478-91. [PMID: 17909209]
21. Kendrick D, Fielding K, Bentley E, et al. Radiography of the lumbar spine in primary care patients with low back pain: randomised controlled trial. BMJ. 2001;322:400-5. [PMID: 11179160]
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24. Pincus T, Burton AK, Vogel S, et al. A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. Spine. 2002; 27:E109-20. [PMID: 11880847]

25. Malmivaara A, Häkkinen U, Aro T, et al. The treatment of acute low back pain—bed rest, exercises, or ordinary activity? N Engl J Med. 1995;332:351-5. [PMID: 7823996]
26. Hagen KB, Jamtvedt G, Hilde G, et al. The updated cochrane review of bed rest for low back pain and sciatica. Spine. 2005;30:542-6. [PMID: 15738787]
27. Liddle SD, Baxter GD, Gracey JH. Exercise and chronic low back pain: what works? Pain. 2004;107:176-90. [PMID: 14715404]
28. Hayden JA, van Tulder MW, Tomlinson G. Systematic review: strategies for using exercise therapy to improve outcomes in chronic low back pain. Ann Intern Med. 2005; 142:776-85. [PMID: 15867410]
29. Hayden JA, van Tulder MW, Malmivaara AV, et al. Meta-analysis: exercise therapy for nonspecific low back pain. Ann Intern Med. 2005; 142:765-75. [PMID: 15867409]
30. Sherman KJ, Cherkin DC, Erro J, et al. Comparing yoga, exercise, and a self-care book for chronic low back pain: a randomized, controlled trial. Ann Intern Med. 2005; 143:849-56. [PMID: 16365466]
31. van Tulder MW, Koes BW, Bouter LM. Conservative treatment of acute and chronic nonspecific low back pain. A systematic review of randomized controlled trials of the most common interventions. Spine. 1997;22:2128-56. [PMID: 9322325]
32. Bronfort G, Haas M, Evans RL, et al. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004;4:335-56. [PMID: 15125860]
33. Assendelft WJ, Morton SC, Yu EI, et al. Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies. Ann Intern Med. 2003;138:871-81. [PMID: 12779297]

return to work quickly. Lacking any warning signs of serious underlying pathologic conditions, clinicians should encourage patients to minimize bed rest, to be as active as possible, and to return to work as soon as possible even if not entirely pain-free.

*A randomized trial that enrolled 186 employees of the city of Helsinki, Finland, who presented to an occupational health center with acute, nonspecific low back pain found that patients assigned to continue usual activities had better recovery at 3 and 12 weeks than those assigned to bed rest for 2 days or back-mobilizing exercises. Recovery was slowest among patients assigned to bed rest (25).*

*A 2005 systematic review of RCTs investigating bed rest for patients with acute low back pain concluded that people with low back pain without sciatica who receive advice for bed rest have more pain and worse functional recovery than those advised to continue normal activities. Pain and functional outcomes were similar for patients with sciatica whether they followed bed rest or remained active (26).*

*Another systematic review of 39 randomized trials that involved 7347 patients with acute, subacute, or chronic symptoms concluded that advice to stay active was sufficient for acute low back pain. Advice delivered as part of an educational program ("back school") seemed effective for patients with subacute symptoms, but the quality of the evidence for subacute low back pain was limited and of poor quality. For chronic low back pain, there is strong evidence to support advice to remain active in addition to specific advice about exercise and self-management (27).*

Various back-specific exercise programs have been advocated beginning when acute symptoms subside, but there is little evidence to support any specific exercise therapy. Clinicians should advise patients that attainment and maintenance of general physical fitness may help to prevent recurrences of low back pain.

*A meta-analysis of 61 RCTs that included 6390 patients with acute (11 trials), subacute (6 trials), chronic (43 trials), or uncertain-duration (1 trial) low back pain concluded that exercise offers slight benefits in pain and function in adults with chronic low back pain, especially in health care rather than occupational settings. In patients with subacute pain, some evidence supported the effectiveness of graded exercise programs in improving work absenteeism, but the evidence was inconclusive for other outcomes. For patients with acute low back pain, exercise therapy was as effective as no therapy or other conservative treatments (28).*

*A review of 43 trials that included 72 exercise treatment groups and 31 comparison groups found that exercise therapy delivered under supervision and consisting of individually tailored programs that include stretching or strengthening may improve pain and function for patients with chronic, nonspecific low back pain. Available trials were heterogeneous and of variable quality, so the authors were unable to make definitive conclusions about the relationship of outcomes with patient characteristics or exercise type (29).*

*An RCT compared 12-week sessions of yoga, conventional exercise, or a self-care book in 101 adults with chronic low back pain. Patients in the yoga group had the best outcomes with respect to pain and function, followed by exercise then self-care (30).*

## What other physical interventions are effective in the treatment of low back pain?

Physical interventions for treatment of low back pain include physical therapy and complementary–alternative medicine approaches, such as spinal manipulation and massage. There is limited evidence that physical treatments help to prevent recurrent back pain, and their use is associated with increased cost. Nevertheless, physical treatments may be helpful in improving function and reducing pain in symptomatic acute and subacute low back pain (31–33). Clinicians should consider physical interventions for patients with acute symptoms that persist after 1 to 2 weeks. It is possible that prescribed physical therapy can help reduce disability by encouraging patients to be active in a safe, supervised setting.

*A 2007 systematic review of nonpharmacologic therapies for acute and chronic low back pain considered the benefits and harms of acupuncture, back schools, psychological therapies, exercise therapy, functional restoration, interdisciplinary therapy, massage, physical therapies (inferential therapy, low-level laser therapy, lumbar supports, short-wave diathermy, superficial heat, traction, transcutaneous electrical nerve stimulation, and ultrasonography), spinal manipulation, and yoga. According to these authors, there is good evidence of moderate efficacy in chronic or subacute low back pain for cognitive behavioral therapy, exercise, spinal manipulation, and interdisciplinary rehabilitation. For acute low back pain, the only therapy with good evidence of efficacy was superficial heat (34).*

## When should drug therapies be considered for the treatment of low back pain and which drugs are effective?

Various drug therapies are used for low back pain (Table 3). Evidence is insufficient to identify one medication as offering a clear overall advantage because of complex trade-offs between benefits and harms, but acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs) should be used as first-line drug therapy. The latter have been shown to reduce low back pain compared with placebo in systematic reviews of clinical trials (35, 36). Although no randomized trials of acetaminophen in low back pain are available, it is reasonable to recommend it as appropriate therapy because of its known effectiveness and safety as an analgesic.

Short courses of muscle relaxants or opiates should be considered as adjunctive therapy only when needed for patients who do not respond to first-line analgesics. Muscle relaxants are more effective than placebo in reducing pain and relieving symptoms. However, studies have not shown them to be more effective than NSAIDs, and the muscle relaxants have more side effects, including adverse central nervous system effects (37, 38).

Although opiates are commonly prescribed for acute, subacute, and chronic low back pain, they have not been shown to be more effective than acetaminophen or NSAIDs and are associated with more side effects, including the potential for addiction (37, 39).

*A systematic review of studies of opioids for the treatment of chronic back pain in nonpregnant adults found that opioid prescription rates in 11 studies varied widely (3% to 66%). In 4 short-term, randomized trials that compared opioids with placebo or nonopioid analgesics, opioids did not provide better pain relief. In poor-quality, heterogeneous studies, the prevalence of current substance abuse disorders in patients taking long-term opioids for back pain was as high as 43%. Aberrant medication-taking behaviors varied from 5% to 24% (40).*

The role of antidepressants in treating chronic low back pain in patients without depression is uncertain. Antidepressants that inhibit norepinephrine reuptake (for example, tricyclic and tetracyclic antidepressants) may improve symptoms in patients with chronic low back pain, but antidepressants lacking inhibition of norepinephrine reuptake (for example, selective serotonin reuptake inhibitors) have not shown benefit in pain relief or functional status (41). A review of 9 RCTs found that tricyclic antidepressants were more effective than placebo in reducing the severity of pain but not in improving functional status in chronic back pain (42). Antidepressants are not appropriate therapy for acute low back pain.

Anticonvulsants, such as carbemazapine or gabapentin, are sometimes used to treat chronic low back pain and have demonstrated efficacy in treating sciatica, but evidence is lacking about their effectiveness in the management of low back pain. Similarly, limited evidence supports the use of tramadol. There is good evidence that systemic


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**Table 3. Drug Treatment for Low Back Pain***

| Agent | Mechanism of Action | Side Effects | Notes |
|---|---|---|---|
| Acetaminophen, 500–1000 mg q 4–6 h (max daily dose 4 g) | Inhibition of prostaglandin synthesis in the CNS. | Antipyretic effect may mask fever. Hepatotoxicity at high doses. | First-line analgesic therapy for low back pain. Avoid dosing >4 g/d, especially in patients who use combination products. Inexpensive. |
| Salicylates/NSAIDs,<br>Aspirin, 500–1000 mg q4–6h (max daily dose, 4 g)<br>Ibuprofen, 400–800 mg, q 6–8 h (max daily dose, 2400 mg)<br>Naproxen, 250–275 mg, q 8–12 h (max daily dose, 1250 mg) | Decrease prostaglandins produced by the arachidonic acid cascade in response to noxious stimuli, thereby decreasing the number of pain impulses received by the CNS. | Gastrointestinal upset or ulceration. Decreased renal blood flow. Inhibition of platelet aggregation. Antipyretic effect may mask fever in patients in whom fever would be an important clinical clue. COX-2–selective agents, and potentially NSAIDs, are associated with increased cardiovascular risk. | First-line analgesic therapy for low back pain. Generic agents are inexpensive. No evidence that COX-2–selective agents are more effective than nonselective agents. Anecdotal reports indicate benefit in patients with bone-related pain. |
| Short-acting opioids,<br>Codeine (alone, or in acetaminophen with codeine), 30–60 mg, q 4 h<br>Hydrocodone (alone or with acetaminophen, aspirin, or ibuprofen), 5–10 mg, q 4 h<br>Oxycodone (alone or with acetaminophen), 5–10 mg, q 4 h | Activate endogenous pain modulating systems and produce analgesia by mimicking the action of endogenous opioid compounds. | Constipation, nausea, and sedation are common side effects. Dry mouth, pruritus, mental confusion, biliary spasm, urinary retention, and myoclonus or respiratory depression (at high doses) are less-common side effects. Addiction potential. | Short courses can be considered as adjunctive therapy only when needed for patients who do not respond to first-line analgesics. Should not be used long-term to treat chronic low back pain. Use equianalgesic conversion to convert between different opioids and different routes. Evidence lacking to show greater efficacy than first-line analgesic agents. |
| Muscle relaxants,<br>Baclofen, start with 5 mg PO tid, increase slowly, max daily dose 80 mg given in 3–4 divided doses<br>Cyclobenzaprine, 5 mg tid | Reduce muscle spasm that may be contributing to symptoms. | CNS effects. | Short courses can be used as adjunctive therapy for patients who do not respond to first-line analgesics. More effective than placebo in reducing pain and relieving symptoms, but no more effective than first-line analgesics. Insufficient evidence to recommend one over another. |
| Antidepressants,<br>Amitriptyline, doses of 10–150 mg/d PO can be used. Start at low doses and gradually increase as needed. | Affects pathways that lead to neuropathic pain. | Drowsiness, dry mouth, dizziness, and constipation are common. Trials not designed to assess serious adverse events, such as overdose, suicidality, or arrhythmias. | Most evidence of effectiveness for tricyclic antidepressants. Paroxetine and trazadone did not show effectiveness. Insufficient evidence to judge relative effectiveness of tricyclic antidepressants versus selective serotonin reuptake inhibitors. Should not be used for acute low back pain. More effective than placebo for pain relief, but had no clear benefit on function. |
| Anticonvulsants,<br>Gabapentin, 300–900 mg tid (start 300 mg, qhs, and titrate quickly to max daily dose 3600 mg)<br>Carbamazepine, 200–600 mg bid | Affect pathways that lead to neuropathic pain. | Sedation. Need to adjust gabapentin dose on the basis of renal function. | Limited evidence or effectiveness. Can be expensive. Other, newer agents being evaluated for use in neuropathic pain include lamotrigine and topiramate. |
| Tramadol, 100 mg PO daily of the extended-release tablets. Titrate in 100-mg increments every 5 days, if needed, up to max daily dose 300 mg. Concomitant use of the extended-release tablets with other tramadol products is not recommended. | Centrally acting analgesic with a dual mechanism of action. It is a μ-opioid receptor agonist and a weak inhibitor of norepinephrine and serotonin reuptake. | Flushing, insomnia, orthostatic hypotension, weakness, rigors, and anorexia. Other side effects include dizziness, vertigo, dry mouth, gastrointestinal symptoms diaphoresis, and CNS effects. | More effective than placebo for short-term improvement in pain and function. No trials available that compare tramadol with first-line analgesics. |

** bid = twice daily; CNS = central nervous system; COX-2 = cyclooxygenase 2; GI = gastrointestinal; NSAID = nonsteroidal anti-inflammatory drug; PO = orally; qd = once daily; qhs = every night; qid = four times daily; tid = three times daily.*

corticosteroids do not improve chronic low back pain (37).

## Are complementary–alternative medicine therapies effective in the treatment of low back pain?

Complementary–alternative medicine therapies are commonly used for back pain. Among the interventions that probably have some benefit are spinal manipulation, massage, and acupuncture. Some evidence supports the use of willow bark extract, also known as salicin, and devil's claw. There is only limited research on homeopathic remedies, acupressure, and chondroitin sulfate. Treatments with unknown effectiveness include glucosamine, balneotherapy or spa therapy, and pilates. Alternative therapies that are probably ineffective include bipolar magnets, the Feldenkrais Method, and reflexology.

*A Cochrane review of massage concluded that for subacute and early, chronic low back pain, moderate evidence suggests that massage improves pain intensity and pain quality, compared with sham treatment. However, these effects were similar to the effects for exercise and manipulation (43).*

*A systematic evidence review concluded that spinal manipulation is efficacious compared with placebo in the short term for both acute and chronic low back pain, but evidence does not support it as being more effective than other standard treatments (33).*

*The most recent Cochrane review of acupuncture and dry-needling for low back pain included 35 RCTs. It noted evidence of pain relief and functional improvement for chronic low back pain (immediately after therapy or on short-term follow-up). Although the effects are small, acupuncture used as an adjunct to conventional therapies appears to relieve pain and improve function in chronic low back pain more than the conventional therapies alone. Only 3 of the studies looked at acute low back pain, so the authors were unable to draw conclusions about efficacy of acupuncture for acute symptoms (44).*

*A Cochrane review concluded that there is some evidence that taking 240 mg of willow bark extract (salicin) per day provides short-term benefit for acute exacerbations of chronic, nonspecific low back pain (45).*

*A Cochrane review concluded that there is strong evidence that taking devil's claw containing 50 to 100 mg of harpagoside per day was better than placebo for short-term improvement of acute or chronic back pain. There is no evidence to support long-term use of devil's claw, and safety has not been carefully studied (45).*

## What are the indications for surgical intervention for low back pain?

Most cases of low back pain do not require surgery. However, patients with suspected cord or cauda equina compression or spinal infection require urgent surgical referral for possible decompression or debridement to prevent loss of neurologic function. Nonurgent surgical evaluation is also appropriate in patients with worsening suspected spinal stenosis, neurologic deficits, or intractable pain that is resistant to conservative treatment. Standard surgery for spinal stenosis is posterior decompressive laminectomy.

*In a study that enrolled patients with imaging-confirmed lumbar spinal stenosis without spondylolisthesis and at least 12 weeks of symptoms in either a randomized cohort (n = 289) or an observational cohort (n = 365), 67% of patients randomly assigned to surgery and 43% of those randomly assigned to nonsurgical care had surgery. In the randomized cohort, pain but not functional outcomes were better among those assigned to surgery than among those assigned to nonsurgical care. In an analysis of both cohorts, patients who had surgery had better pain and functional outcomes at 3 months and at 2 years than those who did not have surgery (46).*

*A prospective cohort study of patients with disk herniations treated at 13 U.S. spine centers found that patients with sciatica who chose operative intervention reported greater improvements than those who chose nonsurgical care (47).*


41. Staiger TO, Gaster B, Sullivan MD, et al. Systematic review of antidepressants in the treatment of chronic low back pain. Spine. 2003; 28:2540-5. [PMID: 14624092]
42. Salerno SM, Browning R, Jackson JL. The effect of antidepressant treatment on chronic back pain: a meta-analysis. Arch Intern Med. 2002;162:19-24. [PMID: 11784215]
43. Furlan AD, Brosseau L, Imamura M, et al. Massage for low-back pain: a systematic review within the framework of the Cochrane Collaboration Back Review Group. Spine. 2002;27: 1896-910. [PMID: 12221356]
44. Furlan AD, van Tulder MW, Cherkin DC, et al. Acupuncture and dry-needling for low back pain. Cochrane Database Syst Rev. 2005: CD001351. [PMID: 15674876]
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46. Weinstein JN, Tosteson TD, Lurie JD, et al. SPORT Investigators. Surgical versus nonsurgical therapy for lumbar spinal stenosis. N Engl J Med. 2008;358:794-810. [PMID: 18287602]
47. Weinstein JN, Lurie JD, Tosteson TD, et al. Surgical vs nonoperative treatment for lumbar disk herniation: the Spine Patient Outcomes Research Trial (SPORT) observational cohort. JAMA. 2006;296:2451-9. [PMID: 17119141]

Signs that urgent surgical intervention may be necessary include bowel- or bladder-sphincter dysfunction, particularly urinary retention or incontinence; diminished perineal sensation, sciatica, or sensory motor deficits; and bilateral or unilateral motor deficits that are severe and progressive. Signs that nonurgent surgical intervention may be necessary include weakness of the ankle and great toe dorsiflexors, loss of ankle reflex, sensory loss in the feet as manifestations of the most common disk herniations, neurogenic claudication or "pseudoclaudication," and leg pain in addition to and more severe than back pain.

Although definitive evidence on the effectiveness of facet joint injections or nerve blocks is not available, such procedures are often done in patients who do not respond to conservative care.

### How should clinicians follow patients with low back pain?

Follow-up, based on the suspected cause and course of disease in patients with low back pain, is an important component of treatment. On the basis of consensus, clinicians should consider scheduling an office visit or a telephone call after 2 to 4 weeks of treatment to assess progress in patients with acute low back pain. The follow-up history should address patient response to treatment, resolution of symptoms, and development of complications. It is important to assess the probability of a transition to the subacute or chronic phase of back pain. Patients with acute back pain who are still moderately symptomatic at 4 weeks are more likely to develop chronic symptoms than those who report improved symptoms. If recovery is delayed, consider reevaluation for possible underlying causes of back pain. Development of symptoms of neurologic dysfunction or systemic disease should prompt additional evaluation.

Reinforcement of healthy lifestyle messages and patient education is an important part of management and prevention of recurrence. This should include advice on treatment, prognosis, and recommendations on general exercise and fitness. In particular, patients with low back pain should be encouraged to continue normal activities. For patients with chronic low back pain, the addition of individually specific advice about the most appropriate exercise and functional activities is required. Regular follow-up contact is also thought to reinforce efforts and to develop ways to overcome barriers to regular physical activity.

Treatment... Most acute nonspecific pain will resolve over days to weeks even without medical intervention. Clinicians should discourage bed rest and encourage all patients to maintain normal activities as much as possible. When symptoms persist, clinicians should consider nondrug, physical interventions, such as physical therapy, exercise, spinal manipulation, and massage. When analgesia is necessary, acetaminophen or NSAIDs should be used as first-line therapy. Short courses of muscle relaxants or opiates should be used cautiously, and antidepressants may be helpful in some patients with chronic symptoms. Psychosocial factors are strong predictors of low back pain outcomes, but good evidence is lacking to support specific strategies for addressing them. Urgent surgical referral is indicated when infection, cancer, acute nerve compression, or the cauda equina syndrome is suspected. Nonurgent surgical referral may be appropriate for patients with persistent back pain and signs of nonacute nerve compression or spinal stenosis.

**CLINICAL BOTTOM LINE**

48. U.S. Preventive Services Task Force. Primary Care Interventions to Prevent Low Back Pain: Brief Evidence Update. Rockville, MD: Agency for Healthcare Research and Quality; 2004. Accessed at www.ahrq.gov/clinic/3rduspstf/lowback/lowbackup.htm on 17 March 2008.

### What do professional organizations recommend regarding the management of patients with low back pain?

In 2007, the American College of Physicians and American Pain Society released guidelines on the diagnosis and treatment of low back pain (20). The guidelines included 7 key recommendations for guiding diagnosis and treatment (see Box).

Several other low back pain guidelines are available. In 1994, the Agency for Health Care Policy and Research published practice guidelines for the assessment and treatment of acute low back problems in adults (17). Topics covered include the initial assessment, identification of signs that suggest esrious underlying disease, management, and diagnostic considerations. An update published in 2004 reported new evidence that back schools and back belts (lumbar supports) are ineffective in preventing low back pain (48).

In 2005, the American College of Sports Medicine released guidelines for exercise testing and prescription in healthy persons and individuals with disease, including guidance for low back pain (49).

A 2001 study of guidelines on low back pain compared clinical guidelines from 11 countries and found that their content was similar regarding diagnostic classification and the use of diagnostic and therapeutic interventions (50) but noted discrepancies for recommendations regarding exercise

**Recommendations from the Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society (20):**

Recommendation 1: Clinicians should conduct a focused history and physical examination to help place patients with low back pain into 1 of 3 broad categories: nonspecific low back pain, back pain potentially associated with radiculopathy or spinal stenosis, or back pain potentially associated with another specific spinal cause. The history should include assessment of psychosocial risk factors, which predict risk for chronic disabling back pain (strong recommendation, moderate-quality evidence).

Recommendation 2: Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain (strong recommendation, moderate-quality evidence).

Recommendation 3: 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).

Recommendation 4: Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with magnetic resonance imaging (preferred) or computed tomography only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy) (strong recommendation, moderate-quality evidence).

Recommendation 5: Clinicians should provide patients with evidence-based information on low back pain with regard to their expected course, advise patients to remain active, and provide information about effective self-care options (strong recommendation, moderate-quality evidence).

Recommendation 6: For patients with low back pain, clinicians should consider the use of medications with proven benefits in conjunction with back care information and self-care. Clinicians should assess severity of baseline pain and functional deficits, potential benefits, risks, and relative lack of long-term efficacy and safety data before initiating therapy (strong recommendation, moderate-quality evidence). For most patients, first-line medication options are acetaminophen or NSAIDs.

Recommendation 7: For patients who do not improve with self-care options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits—for acute low back pain, spinal manipulation; for chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation (weak recommendation, moderate-quality evidence).

49. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. 7th ed. Philadelphia: Lippincott Williams & Wilkins; 2005.
50. Koes BW, van Tulder MW, Ostelo R, et al. Clinical guidelines for the management of low back pain in primary care: an international comparison. Spine. 2001;26:2504-13; discussion 2513-4. [PMID: 11707719]

 

therapy, spinal manipulation, muscle relaxants, and patient information. In 2004, a systematic review of 17 available guidelines for acute low back pain concluded that the overall quality of the evidence suppporting recommendations was disappointing (51), but the diagnostic and therapeutic recommendations of the guidelines were largely similar.

### What is the role of patient education in the management of low back pain?

Patient education is important in the overall management of low back pain, and all patients should receive information about the treatment of back pain and its prognosis. Information and advice given to patients about the management of back pain needs to be individually specific and relevant. Patient education about low back pain should inform patients that back pain is common, that the spontaneous recovery rate is more than 50% to 75% at 4 weeks and more than 90% at 6 months, and that most people do not need surgery even with herniated disks. Clinicians should advise patients to remain active and encourage weight control and should counsel patients about the role of psychosocial distress.

*A randomized trial in 162 patients with back pain compared patients' use of a booklet entitled "The Back Book" to more traditional educational materials. Patients who received the experimental booklet showed an improvement in beliefs about back pain and some improvement in disability measures (52).*


51. van Tulder MW, Tuut M, Pennick V, et al. Quality of primary care guidelines for acute low back pain. Spine. 2004;29:E357-62. [PMID: 15534397]
52. Burton AK, Waddell G, Tillotson KM, et al. Information and advice to patients with back pain can have a positive effect. Spine. 1999;24:2481-91. [PMID: 10626311]


in the clinic

# Tool Kit

## Low Back Pain

### PIER Modules

*www.pier.acponline.org*

Access the following PIER Modules: Low Back Pain, Back Pain (Complementary/Alternative Medicine). PIER modules provide evidence-based guidance for clinical decisions at the point-of-care.

### Patient Education Resources

*www.annals.org/intheclinic/toolkit*

Access the patient information material that appears on the following page for duplication and distribution to patients.

*www.annals.org/cgi/content/summary/147/7/478*

Access a "Summary for Patients" of the American College of Physicians/American Pain Society guidelines on the diagnosis and treatment of low back pain for duplication and distribution to patients.

### Clinical Guidelines

*American College of Physicians/American Pain Society*

*www.annals.org/cgi/reprint/147/7/478.pdf*

Access the 2008 American College of Physicians/American Pain Society guidelines on the diagnosis and treatment of low back pain.

*www.annals.org/cgi/content/full/147/7/478/DC1*

Access an audio summary of the American College of Physicians/American Pain Society guidelines.

*Agency for Healthcare Research and Quality*

*www.ahrq.gov/clinic/3rduspstf/lowback/lowbackrs.htm*

Access the US Preventive services Task Force recommendations on primary care interventions to prevent low back pain in adults.

*American College of Radiology*

*www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonNeurologicImaging/LowBackPainDoc7.aspx*

Access the American College of Radiology Appropriateness Criteria for radiographic procedures in patients with low back pain.

What you should know about

# Low Back Pain

In the Clinic
Annals of Internal Medicine
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**Many people have low back pain at some time in their lives. Back pain is rarely caused by a serious health condition. It often gets better within a few days or weeks. Low back pain can become chronic, meaning that it comes and goes over months to years.**

## If you have low back pain:

- Do not lift heavy things or do strenuous activity
- Try to keep doing everyday activities and walking, even if it hurts
- Do not stay in bed longer than 1 to 2 days, because it can make your recovery slower

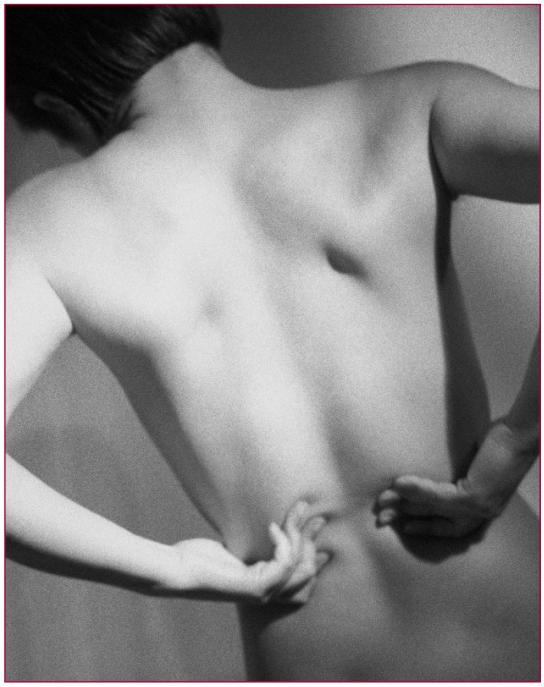
## To help you feel better, try some of these things at home:

- Medicines from the drug store to reduce pain, (acetaminophen, ibuprofen—read the labels)
- Heating pads or hot showers
- Massage

## See a doctor if:

- Pain runs down the leg below the knee
- The leg, foot, groin, or rectal area feels numb
- Fever, nausea or vomiting, stomachache, weakness, or sweating occurs
- Bowel or bladder control is lost
- Pain was caused by an injury
- Pain is so bad you can't move around
- Pain doesn't seem to be getting better after 2 to 3 weeks

The American College of Physicians and the American Pain Society published guidelines on the diagnosis and treatment of low back pain in December 2007. For a "Summary for Patients" of these guidelines go to **www.annals.org/cgi/reprint/147/7/478.pdf**



## For More Information

**MedlinePlus**
http://www.nlm.nih.gov/medlineplus/backpain.html

**The Arthritis Foundation**
http://ww2.arthritis.org/conditions/DiseaseCenter/back_pain.asp

National Institutes of Neurological Disorders and Stroke
http://www.ninds.nih.gov/disorders/backpain/backpain.htm

**American Academy of Family Physicians**
(information available in English and Spanish)
http://familydoctor.org/online/famdoces/home/common/pain/treatment/117.html

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Patient Information

# CME Questions

MKSAP
MEDICAL KNOWLEDGE Self-Assessment Program

1. A 51-year-old woman with chronic low back pain has a 2-week history of moderate low back pain radiating down her right leg to her right foot following a paroxysm of sneezing. She has no leg weakness or numbness. She takes no prescription medications. Her medical history is notable for a hysterectomy.

   Temperature is 36.9°C (98.5°F). The lumbar paraspinal muscles are tender to palpation. A straight-leg–raising test is positive on the right. Her perineal sensation and rectal sphincter tone are intact. She has difficulty extending her right great toe against resistance, but lower-extremity strength, sensation, and reflexes are otherwise normal. Radiography of the spine shows some degenerative changes but no disk narrowing or vertebral collapse.

   Which of the following is the most appropriate initial management of this patient?

   A. Referral to orthopedic surgeon
   B. Bed rest for 7 days
   C. MRI of the lumbar spine
   D. NSAIDs
   E. Back exercises

2. A 45-year-old male warehouse worker is evaluated for a back injury he experienced 4 months ago when lifting a box; he has been bedridden intermittently since then. Today he is asking for a disability form to be completed. His back pain does not radiate and he has no lower-extremity weakness; however, he reports that both legs are completely numb. He takes over-the-counter NSAIDs but no prescription medications. He has no history of injection drug use and is otherwise healthy.

   Temperature is normal, pulse rate is 74/min, and blood pressure is 126/82 mm Hg. The patient has exquisite diffuse lumbar and paraspinal tenderness to light palpation, with no areas of erythema or warmth; his spinal range of motion is decreased. Pressing downward on his head elicits lower back pain. He is able to passively extend his legs without pain when sitting down, but has back pain radiating down his right leg with a supine straight-leg–raising test. Lower-extremity motor strength is intact, and patellar and ankle reflexes are symmetric.

   Which of the following is the most appropriate next step in the management of this patient's back pain?

   A. Cyclobenzaprine
   B. Psychological evaluation
   C. Epidural corticosteroid injection
   D. Radiography of the lumbar spine
   E. MRI of the lumbar spine

3. A 67-year-old man undergoes urgent evaluation for a 2-month history of low back pain radiating down his right leg that has worsened over the past 3 days, causing him walking difficulty due to leg weakness. He has also been unable to urinate for the past 24 hours. His medical history is notable for chronic obstructive pulmonary disease, diabetes mellitus, prostate cancer, and hyperlipidemia. Medications include bronchodilator inhalers, insulin, leuprolide, simvastatin, and aspirin.

   He is in obvious discomfort. The temperature is normal, pulse rate is 88/min, and blood pressure is 148/72 mm Hg. He has severe lower-lumbar tenderness to palpation, with no bony abnormalities. Lower-extremity strength is 4/5 bilaterally, and the straight-leg–raising test is positive on the right. On rectal examination, there is decreased rectal sphincter tone, diminished sensation over the perineal region and buttocks, and prostate is asymmetric and hard.

   Which of the following is the most appropriate diagnostic imaging evaluation for this patient?

   A. CT of the lumbar spine
   B. MRI of the lumbar spine
   C. Radiography of the lumbar spine
   D. Positron emission tomography
   E. Radionuclide bone scan

4. A 57-year-old man with a long history of intermittent back pain related to his work as a truck driver presents with severe back pain radiating down his left leg that began 2 days ago when he was helping a friend move. He says that his left leg feels weak. He has to urinate 1 or 2 times per night and has slight urinary hesitancy.

   Physical examination shows difficulty moving; pulse rate is 92/min and blood pressure is 150/92 mm Hg; body mass index is 28. Left straight-leg raise causes pain at 45 degrees, his great toe dorsiflexion is weak, and his ankle jerk is diminished. Anal wink is present, the prostate gland is enlarged, and sphincter tone is normal. No sensory level is detectable. He says that he has never had pain like this before, and he asks for pain pills and to be able to go lie down. Lumbosacral spine films are normal and erythrocyte sedimentation rate is 10 mm/h.

   In addition to analgesics and clinical follow-up, what is the best management?

   A. Lumbosacral traction therapy
   B. Chiropractic adjustments
   C. Physical therapy back school and exercise program
   D. Referral to an orthopedic surgeon
   E. Activity as tolerated

5. A 28-year-old man who underwent renal transplantation 1 year ago is evaluated because of a 5-week history of back pain. Pain is present at all times, even at rest, but is particularly severe with any jarring motion of the spine. The patient does not have fever, lower extremity numbness, muscle weakness, or difficulty urinating. He takes combination immunosuppressive therapy.

   Temperature is 37.1°C (98.8°F); other vital signs are also normal. Palpation of the spine reveals localized tenderness and muscle spasm at the upper lumbar spine. Neurologic examination is normal.

   A radiograph of the lumbar spine shows demineralization of the endplates and loss of definition of the anterior aspect of the bony L1–L2 margin. Tuberculin skin testing 7 mm of induration. A chest radiograph is normal.

   Which of the following diagnostic studies should be done next?

   A. CT-guided needle biopsy of the spinal lesion
   B. CT scan of the chest
   C. MRI of the entire spine
   D. Serum protein electrophoresis and urine immunoelectrophoresis
   E. Testicular ultrasonography and whole-body positron

**Questions are largely from the ACP's Medical Knowledge Self-Assessment Program (MKSAP). Go to www.annals.org/intheclinic/ to obtain up to 1.5 CME credits, to view explanations for correct answers, or to purchase the complete MKSAP program.**