Chronic Low Back Pain Guideline

For complete guideline, please go to www.aafp.org

or


"The American Academy of Family Physicians Acute (February 15, 2012) and Chronic (June 15, 2009) back pain EVALUATION guidelines are relevant and useful. They are recommended as a source of history and physical exam assessment so as to distinguish the various etiologies (e.g., nonspecific, degenerative, radicular, spinal stenosis, bony infection, neoplasm, connective tissue disease, trauma) that may require more complicated studies or referral to another level of care such as orthopedics, neurosurgery or pain management."

"It is recommended that the more recently published Annals of Medicine back pain MANAGEMENT guidelines replace those in the referenced AAFP resources."

Guideline History

<table>
<thead>
<tr>
<th>Date Approved</th>
<th>05/03</th>
</tr>
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<tr>
<td>Review/Revised</td>
<td>10/03, 10/05, 10/07, 11/09, 3/10, 10/12, 9/13, 9/15, 9/17, 9/19</td>
</tr>
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<td>Next Review Date</td>
<td>9/21</td>
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</tbody>
</table>
Chronic Low Back Pain: Evaluation and Management

ALLEN R. LAST, MD, MPH, and KAREN HULBERT, MD, Racine Family Medicine Residency Program, Medical College of Wisconsin, Racine, Wisconsin

Chronic low back pain is a common problem in primary care. A history and physical examination should place patients into one of several categories: (1) nonspecific low back pain; (2) back pain associated with radiculopathy or spinal stenosis; (3) back pain referred from a nonspinal source; or (4) back pain associated with another specific spinal cause. For patients who have back pain associated with radiculopathy, spinal stenosis, or another specific spinal cause, magnetic resonance imaging or computed tomography may establish the diagnosis and guide management. Because evidence of improved outcomes is lacking, lumbar spine radiography should be delayed for at least one to two months in patients with nonspecific pain. Acetaminophen and nonsteroidal anti-inflammatory drugs are first-line medications for chronic low back pain. Tramadol, opioids, and other adjunctive medications may benefit some patients who do not respond to nonsteroidal anti-inflammatory drugs. Acupuncture, exercise therapy, multidisciplinary rehabilitation programs, massage, behavior therapy, and spinal manipulation are effective in certain clinical situations. Patients with radicular symptoms may benefit from epidural steroid injections, but studies have produced mixed results. Most patients with chronic low back pain will not benefit from surgery. A surgical evaluation may be considered for select patients with functional disabilities or refractory pain despite multiple nonsurgical treatments. (Am Fam Physician. 2009;79(12):1067-1074. Copyright © 2009 American Academy of Family Physicians.)

Evaluation
The initial evaluation, including a history and physical examination, of patients with chronic low back pain should attempt to place patients into one of the following categories: (1) nonspecific low back pain; (2) back pain associated with radiculopathy or spinal stenosis; (3) back pain referred from a nonspinal source; or (4) back pain associated with another specific spinal cause. For patients who have back pain associated with radiculopathy, spinal stenosis, or another specific spinal cause, magnetic resonance imaging or computed tomography may establish the diagnosis and guide management. Because evidence of improved outcomes is lacking, lumbar spine radiography should be delayed for at least one to two months in patients with nonspecific pain. Acetaminophen and nonsteroidal anti-inflammatory drugs are first-line medications for chronic low back pain. Tramadol, opioids, and other adjunctive medications may benefit some patients who do not respond to nonsteroidal anti-inflammatory drugs. Acupuncture, exercise therapy, multidisciplinary rehabilitation programs, massage, behavior therapy, and spinal manipulation are effective in certain clinical situations. Patients with radicular symptoms may benefit from epidural steroid injections, but studies have produced mixed results. Most patients with chronic low back pain will not benefit from surgery. A surgical evaluation may be considered for select patients with functional disabilities or refractory pain despite multiple nonsurgical treatments. (Am Fam Physician. 2009;79(12):1067-1074. Copyright © 2009 American Academy of Family Physicians.)
30 and 70 degrees) can suggest lumbar disk herniation, with ipsilateral pain being more sensitive (i.e., better at ruling out disk herniation if negative) and contralateral pain being more specific (i.e., better at ruling in herniation if positive).4 Testing deep tendon reflexes, strength, and sensation can help identify which nerve roots are involved.

Laboratory assessment, including erythrocyte sedimentation rate, complete blood count, and C-reactive protein level, should be considered when red flags indicating the possibility of a serious underlying condition are present (Table 25,6). Urinalysis may be useful when urinary tract infections are suspected, and alkaline phosphatase and calcium levels can help identify conditions, such as Paget disease of bone, that affect bone metabolism; however, these tests are not needed in all patients with chronic low back pain.

Imaging has limited utility because most patients with chronic low back pain have nonspecific findings on imaging studies,7 and asymptomatic patients often have abnormal findings.6 Initial imaging with MRI, which is the preferred study, or CT is only recommended for patients with red flags for serious or rapidly progressive disease (Table 25,6) or radicular symptoms that do not spontaneously resolve after six weeks. Because evidence of improved outcomes is lacking, imaging, such as lumbar spine radiography, should be delayed at least one to two months in patients with nonspecific pain without red flags for serious disease.6

Psychosocial issues play an important role in guiding the treatment of patients with chronic low back pain. One study found that patients with chronic low back pain who have a reduced sense of life control, disturbed mood, negative self-efficacy, high anxiety levels, and mental health disorders, and who engage in catastrophizing tend to not respond well to treatments such as epidural steroid injections.8 “Yellow flags” are psychosocial risk factors for long-term disability9 (Table 38-11). Evaluation of psychosocial problems and “yellow flags” are useful in identifying patients with a poor prognosis.8,9

### Management

#### GENERAL PRINCIPLES

The goals of treating chronic low back pain often change over time, shifting from the initial intent to cure to improving pain and function. Patients often have unrealistic expectations of complete pain relief and full return to their previous level of activity. There is often a large gap between a patient’s desired amount of pain reduction and the minimum percentage of improvement that would make a treatment worthwhile.12 Documenting goals and expectations and revisiting them on follow-up visits may be helpful.

Patients should receive information about effective self-care options and should be advised to remain active (because muscles that do not move can eventually become hyporesponsive to pain).13 Assessing the response to therapy should focus on improvements in pain, mood, and function.

Treatment should begin with maximal recommended doses of nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen, followed by adjunctive medications. Nonpharmacologic therapies are effective in certain clinical situations and can be added to the treatment program at any time. For those with severe functional disabilities, radicular symptoms, or refractory pain, referral for epidural steroid injection or surgical evaluation may be reasonable (Figure 1).
Acetaminophen is first-line therapy because of its high safety profile. NSAIDs provide similar analgesia, but have significant gastrointestinal and renovascular adverse effects.²,¹⁴ There are several classes of NSAIDs, and if one class fails, medications from other classes can be tried before abandoning them altogether (Table 4). Tramadol (Ultram), opioids, and other adjunctive medications may benefit some patients who do not respond to NSAIDs.

Table 4. Red Flags Indicating Serious Causes of Chronic Low Back Pain and Evaluation Strategies

<table>
<thead>
<tr>
<th>Finding</th>
<th>Cauda equina syndrome</th>
<th>Fracture</th>
<th>Cancer</th>
<th>Infection</th>
<th>CBC/ESR/CRP level</th>
<th>Plain radiography</th>
<th>MRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age older than 50 years</td>
<td>X</td>
<td>X</td>
<td>1*</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever; chills; recent urinary tract or skin infection; penetrating wound near spine</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant trauma</td>
<td>X</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unrelenting night pain or pain at rest</td>
<td>X</td>
<td>X</td>
<td>1*</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progressive motor or sensory deficit</td>
<td>X</td>
<td>X</td>
<td>1E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saddle anesthesia; bilateral sciatica or leg weakness; difficulty urinating; fecal incontinence</td>
<td>X</td>
<td>1E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unexplained weight loss</td>
<td>X</td>
<td>1*</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of cancer or strong suspicion for current cancer</td>
<td>X</td>
<td>1*</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of osteoporosis</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic oral steroid use</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intravenous drug use</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance abuse</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to improve after six weeks of conservative therapy</td>
<td>X</td>
<td>X</td>
<td>1*</td>
<td>1</td>
<td>2 (or unnessary)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Red flags indicate the possibility of a serious underlying condition.
1 = first-line evaluation in most situations; 2 = follow-up evaluation; CBC = complete blood count; CRP = C-reactive protein; E = emergent evaluation required; ESR = erythrocyte sedimentation rate; MRI = magnetic resonance imaging.
*—Prostate-specific antigen testing may be indicated in men in whom cancer is suspected.

Table 3. Psychosocial “Yellow Flags” Predicting Long-Term Disability in Patients with Chronic Low Back Pain

<table>
<thead>
<tr>
<th>Affect</th>
<th>Anxiety; depression; feeling of uselessness; irritability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>Adverse coping strategies; impaired sleep because of pain; passive attitude about treatment; withdrawal from activities</td>
</tr>
<tr>
<td>Beliefs</td>
<td>Thinks “the worst” or that pain is harmful or uncontrollable, or that it needs to be eliminated (before returning to activities or work)</td>
</tr>
<tr>
<td>Social</td>
<td>History of sexual abuse, physical abuse, or substance abuse; lack of support; older age; overprotective family</td>
</tr>
<tr>
<td>Work</td>
<td>Expectation that pain will increase with work and activity; pending litigation; problems with worker’s compensation or claims; poor job satisfaction; unsupportive work environment</td>
</tr>
</tbody>
</table>

Information from references 9 through 11.

PHARMACOLOGIC TREATMENT OPTIONS
addiction. Adverse effects include drowsiness, constipation, and nausea.

All muscle relaxants provide similar short-term improvements in pain and function, but there is no evidence to support their long-term use for chronic low back pain. Sedation is a common adverse effect, and chronic use of benzodiazepines and carisoprodol (Soma) carries the risk of dependency. 17

A 2006 Cochrane review 18 found that some herbal medications appear effective in short-term randomized trials, but lack long-term safety data. Harpagophytum procumbens (devil’s claw) in a dosage of 50 mg daily, Salix alba (white willow bark, a source of salicylic acid) in a dosage of 240 mg daily, and Capsicum frutescens (cayenne) plaster applied topically every day appear to be better than placebo at reducing chronic low back pain. Limited studies have shown that devil’s claw and white willow bark appear to be as effective as NSAIDs. 18

Short-acting (immediate-release) and long-acting (sustained-release) opioid analgesics are sometimes used for chronic low back pain. There have been few high-quality trials to assess the effectiveness and potential risks of these medications in chronic low back pain. 19

Taking opioids can lead to the development of tolerance, hyperalgesia (enhanced pain response to noxious stimuli), and alldynia (enhanced pain response to innocuous stimuli). 20 The combination of tolerance and hyperalgesia can decrease opioid effectiveness over time. One of the challenges of treating chronic low back pain is differentiating among tolerance, opioid-induced hyperalgesia, and disease progression. Hyperalgesia involves increasing pain despite increasing opioid treatment, pain that becomes more diffuse and beyond the distribution of the preexisting pain, and an apparent change in pain threshold or tolerability. 20 In this situation, the dosage of opioids should be decreased, or patients should be weaned off the medication altogether.

Selective serotonin reuptake inhibitors, SNRIs, and antiepileptic medications have not been shown to help patients with chronic low back pain. Tricyclic antidepressants, however, provide some benefit and can be a

![Pharmacologic options:]
- Acetaminophen
- Herbal therapies (devil’s claw, white willow bark, topical cayenne)
- Muscle relaxants (short-term use)
- Nonsteroidal anti-inflammatory drugs
- Opioids
- Tramadol (Ultram)
- Tricyclic antidepressants
- If radiculopathy, gabapentin (Neurontin)

![Nonpharmacologic options:]
- Acupuncture
- Behavior therapy
- Exercise therapy
- Massage
- Spinal manipulation
- Viniyoga

![Figure 1. Treatment algorithm for patients with chronic low back pain.](https://www.aafp.org/afp)

useful addition to analgesic therapy.\textsuperscript{21} Gabapentin (Neurontin) may provide short-term relief in patients with radiculopathy.\textsuperscript{2}

**NONPHARMACOLOGIC TREATMENT OPTIONS**

Patients commonly use nonpharmacologic treatment options, with or without consulting a physician. Forty-five percent of patients with low back pain see a chiropractor, 24 percent use massage, 11 percent get acupuncture, and 7 percent try meditation.\textsuperscript{22}

Acupuncture provides short-term relief of chronic low back pain, improves functioning, and works as an adjunct to other therapeutic options. It has not been shown to be more effective than other treatments.\textsuperscript{23,24}

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### Table 4. Classes of Nonsteroidal Anti-inflammatory Drugs for Chronic Low Back Pain

<table>
<thead>
<tr>
<th>Class</th>
<th>Generic (brand)</th>
<th>Standard dosage</th>
<th>Maximal dosage (mg per day)</th>
<th>Approximate monthly cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salicylic acids</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td></td>
<td>325 to 650 mg every four hours</td>
<td>4,000</td>
<td>$3 for 325-mg dose</td>
</tr>
<tr>
<td>Diflunisal (Dolobid)</td>
<td></td>
<td>500 mg two times daily</td>
<td>1,500</td>
<td>$77 (generic) and $73 (brand)</td>
</tr>
<tr>
<td>Salsalate</td>
<td></td>
<td>1,500 mg two times daily</td>
<td>3,000</td>
<td>$27 to $40</td>
</tr>
<tr>
<td>Choline magnesium trisalicylate</td>
<td></td>
<td>1,500 mg two times daily</td>
<td>3,000</td>
<td>$44 to $54</td>
</tr>
<tr>
<td>Acetic acids</td>
<td></td>
<td>50 mg three times daily</td>
<td>200</td>
<td>$140 to $173 (generic) and $327 (brand)</td>
</tr>
<tr>
<td>Diclofenac potassium (Cataflam)</td>
<td></td>
<td>50 mg two or three times daily</td>
<td>200</td>
<td>$85 to $98 (generic) and $192 (brand) for 50 mg two times daily</td>
</tr>
<tr>
<td>Indomethacin (Indocin)</td>
<td></td>
<td>25 to 50 mg three times daily</td>
<td>200</td>
<td>$77 to $90 for 200 mg two times daily</td>
</tr>
<tr>
<td>Indomethacin, extended release (Indocin SR)</td>
<td></td>
<td>25 to 50 mg one or two times daily</td>
<td>150</td>
<td>$5 to $30 (generic) and $80 (brand) for 25-mg dose</td>
</tr>
<tr>
<td>Sulindac (Clinoril)</td>
<td></td>
<td>200 mg two times daily</td>
<td>400</td>
<td>$60 (generic) and $84 (brand) for 25 mg once daily</td>
</tr>
<tr>
<td>Tolmetin</td>
<td></td>
<td>200 to 600 mg three times daily</td>
<td>1,800</td>
<td>$72 to $80 (generic) and $86 (brand)</td>
</tr>
<tr>
<td>Oxycam</td>
<td>Meloxicam (Mobic)</td>
<td>7.5 to 15 mg once daily</td>
<td>15</td>
<td>$95 to $108 (generic) and $117 (brand) for 7.5-mg dose</td>
</tr>
<tr>
<td></td>
<td>Piroxicam (Feldene)</td>
<td>20 mg once daily</td>
<td>20</td>
<td>$79 to $104 (generic) and $133 (brand)</td>
</tr>
<tr>
<td>Propionic acids</td>
<td></td>
<td>600 mg four times daily or 800 mg three times daily</td>
<td>2,400</td>
<td>$30 to $35 (generic) and $48 for 600-mg dose</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td></td>
<td>50 to 100 mg three times daily</td>
<td>300</td>
<td>$60 to $204 for 50-mg dose</td>
</tr>
<tr>
<td>Ketoprofen</td>
<td></td>
<td>250 to 500 mg two times daily</td>
<td>1,500</td>
<td>$42 to $72 (generic) and $70 (brand) for 250-mg dose</td>
</tr>
<tr>
<td>Naproxen (Naprosyn)</td>
<td></td>
<td>275 to 550 mg two times daily</td>
<td>1,650</td>
<td>$50 to $53 (generic) and $63 (brand) for 275-mg dose</td>
</tr>
<tr>
<td>Naproxen sodium (Anaprox)</td>
<td></td>
<td>1,200 mg once daily</td>
<td>1,800</td>
<td>$108 to $164 (generic) and $157 (brand)</td>
</tr>
<tr>
<td>Oxaprozin (Daypro)</td>
<td></td>
<td>1,000 to 2,000 mg one or two times daily</td>
<td>2,000</td>
<td>$77 to $98 (generic) and $107 (brand) for 1,000 mg once daily</td>
</tr>
<tr>
<td>Anthranilic acid</td>
<td>Meclofenamate</td>
<td>50 to 100 mg four times daily</td>
<td>400</td>
<td>$220 for 50-mg dose</td>
</tr>
<tr>
<td>Cyclooxygenase-2 inhibitor</td>
<td>Celecoxib (Celebrex)</td>
<td>200 mg two times daily</td>
<td>400</td>
<td>$240</td>
</tr>
<tr>
<td>Nonacidic agent</td>
<td>Nabumetone</td>
<td>1,000 to 2,000 mg one or two times daily</td>
<td>2,000</td>
<td>$77 to $98 (generic) and $107 (brand) for 1,000 mg once daily</td>
</tr>
</tbody>
</table>

*—Estimated cost to the pharmacist based on average wholesale prices (rounded to the nearest dollar) in Red Book, Montvale, N.J.: Medical Economics Data; 2008. Cost to the patient will be higher, depending on prescription filling fee. Cost is based on standard dosage unless otherwise indicated. Some of these medications are available at considerable savings through local and national pharmacy discount programs.
Fifty-one to 64 percent of patients are willing to try acupuncture if recommended by their physician.\(^\text{22}\)

Exercise therapy, focusing on strengthening and stabilizing the core muscle groups of the abdomen and back, appears to produce small improvements in pain and functioning in patients with chronic low back pain. However, few studies (i.e., six of the 43 studies included in a Cochrane review) have been able to demonstrate clinically important and statistically significant differences between intervention and control groups.\(^\text{25,26}\)

Behavior therapy is as effective as exercise therapy for short-term relief of chronic low back pain. Consistent evidence supports cognitive behavior therapy and progressive relaxation for short-term improvement, whereas biofeedback techniques have produced mixed results. Combining behavior therapy with other modalities does not have an additive effect.\(^\text{2}\)

Multidisciplinary rehabilitation programs that include a physician and at least one additional intervention (psychological, social, or vocational) alleviate subjective disability, reduce pain, return persons to work five weeks earlier, and after returning to work, reduce the amount of sick time in the first year by seven days. Benefits persist for up to five years.\(^\text{27,28}\)

Acupuncture massage and pressure point massage are mildly helpful for reducing chronic low back pain, and the benefits last for up to one year. Massage appears to be most effective when combined with exercise, stretching, and education.\(^\text{29}\)

Spinal manipulation provides modest short- and long-term relief of back pain, improves psychological well-being, and increases functioning.\(^\text{2,30}\) The benefits derived are not dependent on the type of training of the manipulator because osteopathic and chiropractic outcomes appear to be similar.\(^\text{31}\)

One therapeutically directed style of yoga (Viniyoga) may provide some relief of chronic back pain. Six weeks of yoga decreased medication use and provided more pain relief than exercise and self-care. Other forms of yoga have mixed results in small studies, and at this time there is not enough evidence to recommend them.\(^\text{32}\)

**Back schools, low-level laser therapy, lumbar supports, prolotherapy, short wave diathermy, traction, transcutaneous electrical nerve stimulation, and ultrasound have negative or conflicting evidence of effectiveness.**\(^\text{32-35}\)

**Epidural Steroid Injections**

Epidural steroid injections may help patients with radicular symptoms. Studies have found conflicting results,
but the trend is toward a small improvement for up to three months after injection.6 The evidence is less consistent for epidural steroid injections in patients without radicular symptoms,37 and injections are less effective in patients with severe spinal stenosis and those with stenotic lesions encompassing more than three lumbar levels.37,38

SURGERY
Most patients with back pain will not benefit from surgery. However, if anatomic abnormalities consistent with the distribution of pain are identified, surgery can be considered in persons who have experienced significant functional disabilities and in those with unremitting pain, especially pain lasting longer than 12 months despite multiple nonsurgical treatments. Good evidence supports the use of spinal fusion for treating back pain caused by fractures, infections, progressive deformity, or instability with spondylolisthesis.7 Spinal decompression, nerve root decompression, and spinal fusion have been extensively evaluated for the treatment of degenerative disorders of the spine, mostly with short-term outcomes, yielding conflicting results and questionable patient benefit.39 Disk arthroplasty (replacing the original intervertebral disk with an artificial one) appears to be as effective as lumbar fusion for short-term relief of chronic low back pain, but there is no evidence of long-term relief, and concerns exist regarding the durability of the artificial disks. Intradiscal electrothermal therapy is a technique that applies heat to a damaged disk through a catheter, causing collagen contraction for structural support and ablating nearby pain-sensing nerves for pain reduction. It has been shown to provide modest pain relief, but little functional improvement.40

REFERRAL
Referral to a pain management specialist is appropriate for patients who continue to experience severe functional impairment or unremitting pain, or when patients or physicians feel that progress has stopped or want a second opinion. In the absence of evidence to define the indications and timing of referral, a decision to refer should be left to the discretion of the physician and patient.2

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Author disclosure: Nothing to disclose.

REFERENCES


**Figure.** Summary of the American College of Physicians guideline on noninvasive treatments for acute, subacute, or chronic low back pain.

### Summary of the American College of Physicians Guideline on Noninvasive Treatments for Acute, Subacute, or Chronic Low Back Pain

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Low back pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Audience</td>
<td>All clinicians</td>
</tr>
<tr>
<td>Target Patient Population</td>
<td>Adults with acute, subacute, or chronic low back pain</td>
</tr>
<tr>
<td>Interventions Evaluated</td>
<td>Pharmacologic interventions: NSAIDs, nonopioid analgesics, opioid analgesics, tramadol and tapentadol, antidepressants, SMRs, benzodiazepines, corticosteroids, antiepileptic drugs. Nonpharmacologic interventions: interdisciplinary or multicomponent rehabilitation; psychological therapies; exercise and related interventions, such as yoga or tai chi; complementary and alternative medicine therapies, including spinal manipulation, acupuncture, and massage; passive physical modalities, such as heat, cold, ultrasound, transcutaneous electrical nerve stimulation, electrical muscle stimulation, interferential therapy, short-wave diathermy, traction, LLLT, lumbar supports/braces.</td>
</tr>
<tr>
<td>Outcomes Evaluated</td>
<td>Pain, function, health-related quality of life, work disability/return to work, global improvement, number of back pain episodes or time between episodes, patient satisfaction, adverse effects</td>
</tr>
</tbody>
</table>

#### Benefits

**Acute low back pain**
- **Pharmacologic**
  - NSAIDs: improved pain and function (small effect)
  - SMRs: improved pain (small effect)
- **Nonpharmacologic**
  - Heat wrap: improved pain and function (moderate effect)
  - Massage: improved pain and function (at 1 but not 5 wk) (small to moderate effect)
  - Acupuncture: improved pain (small effect)
  - Spinal manipulation: improved function (small effect)

**Chronic low back pain**
- **Pharmacologic**
  - NSAIDs: improved pain (small to moderate effect) and function (no to small effect)
  - Opioids: improved pain and function (small effect)
  - Tramadol: improved pain (moderate effect) and function (small effect)
  - Buprenorphine (patch or sublingual): improved pain (small effect)
  - Duloxetine: improved pain and function (small effect)
- **Nonpharmacologic**
  - Exercise: improved pain and function (small effect)
  - Tai chi: improved pain (moderate effect) and function (small effect)
  - Mindfulness-based stress reduction: improved pain and function (small effect)
  - Yoga: improved pain and function (small to moderate effect, depending on comparator)
  - Progressive relaxation: improved pain and function (moderate effect)
  - Multidisciplinary rehabilitation: improved pain (moderate effect) and function (no to small effect)
  - Acupuncture: improved pain (moderate effect) and function (no to moderate effect, depending on comparator)
  - LLLT: improved pain and function (small effect)
  - Electromyography biofeedback: improved pain (moderate effect)
  - Operant therapy: improved pain (small effect)
  - Cognitive behavioral therapy: improved pain (moderate effect)
  - Spinal manipulation: improved pain (small effect)

**Radicular low back pain**
- Exercise: improved pain or function (small effect)

#### Harms

**Generally poorly reported**
- **Pharmacologic**
  - NSAIDs: increased adverse effects compared with placebo and acetaminophen (COX-2–selective NSAIDs decreased risk for adverse effects compared with traditional NSAIDs)
  - Opioids: nausea, dizziness, constipation, vomiting, somnolence, and dry mouth
  - SMRs: increased risk for any adverse event and central nervous system adverse events (mostly sedation)
  - Benzodiazepines: somnolence, fatigue, lightheadedness
  - Antidepressants: increased risk for any adverse event
- **Nonpharmacologic**
  - Poorly reported, but no increase in serious adverse effects

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<tr>
<th>Recommendations</th>
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<tr>
<td><strong>Recommendation 1:</strong> Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat (moderate-quality evidence), massage, acupuncture, or spinal manipulation (low-quality evidence). If pharmacologic treatment is desired, clinicians and patients should select nonsteroidal anti-inflammatory drugs or skeletal muscle relaxants (moderate-quality evidence). (Grade: strong recommendation)</td>
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<tr>
<td><strong>Recommendation 2:</strong> For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction (moderate-quality evidence), tai chi, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, or spinal manipulation (low-quality evidence). (Grade: strong recommendation)</td>
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<tr>
<td><strong>Recommendation 3:</strong> In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy, clinicians and patients should consider pharmacologic treatment with nonsteroidal anti-inflammatory drugs as first-line therapy, or tramadol or duloxetine as second-line therapy. Clinicians should only consider opioids as an option in patients who have failed the aforementioned treatments and only if the potential benefits outweigh the risks for individual patients and after a discussion of known risks and realistic benefits with patients. (Grade: weak recommendation, moderate-quality evidence)</td>
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<th>High-Value Care</th>
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<tr>
<td>Clinicians should reassure patients that acute or subacute low back pain usually improves over time regardless of treatment and should avoid prescribing costly and potentially harmful treatments. Systemic steroids were not shown to provide benefit and should not be prescribed for patients with acute or subacute low back pain, even with radicular symptoms. For treatment of chronic low back pain, clinicians should select therapies that have the fewest harms and lowest costs. Clinicians should avoid prescribing costly therapies and those with substantial potential harms, such as long-term opioids, and pharmacologic therapies that were not shown to be effective, such as tricyclic antidepressants and selective serotonin reuptake inhibitors.</td>
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<th>Clinical Considerations</th>
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<tr>
<td>Clinicians should inform patients with acute or subacute low back pain of the generally very favorable outcome. Thus, patients can avoid potentially harmful and costly tests and treatments.</td>
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<tr>
<td>Clinicians should advise patients with acute, subacute, or chronic low back pain to remain active as tolerated.</td>
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<td>Improvements in pain and function due to pharmacologic and nonpharmacologic interventions were small and often showed no clear differences compared with controls.</td>
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<tr>
<td>Few differences in recommended therapies were found when they were studied in head-to-head trials. Therefore, clinicians should base treatment recommendations on patient preferences that also minimize harms and costs.</td>
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COX-2 = cyclooxygenase-2; LLLT = low-level laser therapy; NSAID = nonsteroidal anti-inflammatory drug; SMR = skeletal muscle relaxant.

References