

15. LOW BACK PAIN (ACUTE)¹

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The principal reference for this review is the Clinical Practice Guideline (Number 14) of the Agency for Health Care Policy and Research (AHCPR), titled Acute Low Back Problems in Adults (Bigos et al., 1994). The 23-member multidisciplinary panel based their findings and recommendations on a systematic review and analysis of the literature, their own expertise, public testimony, peer review, and some pretesting in outpatient settings. Where this reference cited studies to support individual indicators, the original references have been included. In addition, a targeted MEDLINE search of the medical literature from 1985 through 1996 was performed to supplement these references for particular indicators.

IMPORTANCE

Although there are a number of methodological challenges in estimating the prevalence of low back pain (Loeser and Volinn, 1991), studies concur that it is the second leading cause of work absenteeism in the United States (Deyo and Bass, 1989). The lifetime prevalence of low back pain has been estimated to be 60 to 80 percent, and the one year prevalence is 15 to 20 percent (Andersson, 1991). Among the working age population, approximately half report symptoms of back pain during a one-year period (Vallfors, 1985; Sternbach, 1986). Approximately five to ten percent of low back patients experience chronic problems (Lahad et al., 1994), but these individuals account for nearly 60 percent of health care expenditures for low back pain.

There is evidence that many patients with low back pain who cannot perform their usual activities may be receiving care that is either inappropriate or suboptimal (Bigos et al., 1994). The evidence includes

¹ This chapter is a revision of one written for an earlier project on quality of care for women and children (Q1). The expert panel for the current project was asked to review all of the indicators, but only rated new or revised indicators.

substantial variations in the rates of hospitalization and surgery for low back problems (Deyo, 1991; Kellett et al., 1991; Volinn et al., 1992) and variations in the use of diagnostic tests (Deyo, 1991). For example, in a study conducted in Washington state, the rate of surgery for low back pain varied 15-fold among the 39 counties in the state (Volinn et al., 1992). The most likely explanation for this variation is differences in physicians' practice styles. A study of the effect of physician practice style on low back patient outcomes found that a low-intensity intervention style characterized by self-care, fewer prescription medications, and less bed rest produced long-term pain relief and functional outcomes that were similar to more intensive styles, while also being less costly and associated with higher levels of patient satisfaction (Von Korff et al., 1994). There are also patients who appear to have more disability after treatment than before, particularly those who have undergone surgery, those treated with extended bed rest, and those treated with longer-term use of high-dose opioids (Bigos et al., 1994).

The lack of consensus on appropriate treatment for low back pain suggests that there is probably considerable variation in practice patterns across the country. The recent promulgation of a clinical practice guideline by the AHCPR offers an opportunity for developing tools to monitor the use of both recommended and nonrecommended practices. This may provide a substantial incentive for decreasing the variation in care and reducing poor quality care.

In 1990, the direct medical costs of low back pain treatment were \$24 billion (Lahad, 1994). The costs of work days lost plus disability payments have been estimated to be more than three times the national expenditures on medical treatment, suggesting that the total annual costs of back pain may exceed \$100 billion.

The costs of different approaches to treating back pain vary considerably. One study examining the costs and outcomes of three different management styles for back pain found differences in the average one-year costs of treatment ranging from \$428 for patients seen by "low-intensity" physicians to \$768 for patients seen by "high-intensity" physicians (Von Korff et al., 1994). The difference between

the low- and high-intensity management costs was reduced from \$340 to \$277 when case mix variables were taken into account. Because the lower intensity practice style produced similar outcomes, that style would certainly be judged to be more cost effective.

SCREENING AND PRIMARY PREVENTION

There is no strong evidence to suggest that primary preventive strategies for low back pain are effective. The literature evaluating the effectiveness of four prevention strategies was recently reviewed (Lahad et al., 1994). The strategies included back and aerobic exercises, education, mechanical supports, and risk factor modification. The authors did not examine worksite-specific preventive measures, although all of the prevention studies included in the review were conducted in work settings.

Exercise may offer some protection against the development of back pain. Four randomized trials of exercise interventions have been conducted (Gundewall et al., 1993; Donchin et al., 1990; Kellet et al., 1991; Linton et al., 1989). All four studies were conducted in specific worksites with relatively small study populations ranging from 66 to 142 subjects. None of the studies followed subjects for longer than 18 months. The trials were consistent in their findings that fewer lost work days occurred in the preventive intervention groups as compared with the control groups. Among epidemiological studies, seven found an association between fitness or flexibility and decreased low back pain, but four of these studies showed no protective effect of exercise (Lahad et al., 1994). The authors of the review conclude that, taken together, the studies suggest that exercise is mildly protective (Lahad et al., 1994).

General education does not contribute to preventing low back pain. Five randomized trials of educational interventions have been conducted (Daltroy et al., 1993; Walsh and Schwartz, 1990; Donchin et al., 1990; McCauley, 1990; Linton et al., 1989). As with the exercise studies, these trials also enrolled small numbers of subjects and were conducted in specific work sites. Only one of the randomized trials of educational intervention found a decrease in subsequent low back pain

(Linton et al., 1989); however, this trial also included exercise, which makes it difficult to determine the independent role of education. Among the other four trials, three had intermediate positive outcomes and all four had long-term negative outcomes. The authors conclude that there is minimal support in the literature for the use of educational strategies (Lahad et al., 1994).

The use of orthotic devices has not been shown to prevent low back pain. Two trials examining the use of lumbar corsets for the prevention of low back pain have been conducted (Reddell et al., 1992; Walsh and Schwartz, 1990). One trial had a very low compliance rate for the intervention groups: 58 percent of those assigned to wear a back belt stopped wearing it before the end of the study. Based on an intention-to-treat analysis, the intervention group had a trend toward increased frequency of back pain (Reddell et al., 1992). The other trial found that subjects assigned to an educational intervention plus lumbar corsets had a greater increase in knowledge and decrease in work days lost compared with controls (2.5-day decrease vs. 0.4-day increase). The authors of the review article conclude that, given the contradictory findings in these two trials, there is insufficient evidence to allow for a recommendation to be made regarding the use of orthotic devices for low back pain prevention (Lahad et al., 1994).

Several risk factors have been associated with increased risk of developing low back pain, including smoking, obesity, and psychological functioning. Studies have shown an association between smoking and back pain, indicating that risk is increased by 1.5 to 2.5 times compared with nonsmokers (Deyo and Bass, 1989). Similarly, an association between obesity and back pain has been observed, but no interventions have been conducted to determine the effect of weight reduction on back pain (Deyo and Bass, 1989). The psychological factors include depression, anxiety, and job stress, but no intervention studies of reducing psychological risk factors to prevent back pain have been conducted. The authors of the review article conclude that, while there are other health-related reasons to suggest the importance of interventions to modify these three risk factors, there is no evidence

that demonstrates that a reduction in back pain will be the result (Lahad et al., 1994).

As reviewed in this section, there is no strong evidence supporting preventive strategies for acute low back pain. Therefore, screening patients for acute low back pain is not recommended.

DIAGNOSIS

The AHCPR's clinical practice guideline on the assessment and treatment of acute low back problems in adults (Bigos et al., 1994) indicates that the medical history is important in assessing whether the patient is suffering from a serious underlying condition such as cancer or spinal infection. The guideline recommends that the history include questions about age, history of cancer, unexplained weight loss, immunosuppression, duration of symptoms, responsiveness to previous therapy, pain that is worse at rest, history of intravenous drug use, and urinary tract or other infection. Symptoms of leg pain or problems walking due to leg pain may suggest neurological problems such as herniated disc or spinal stenosis. The elements of the suggested medical history along with estimates of the sensitivity and specificity of those elements are provided in the guideline document (Indicator 1). An algorithm is provided for the use of responses to the initial assessment. The guideline panel noted that factors such as work status, educational level, workers compensation issues, and depression may affect patients' responses to questions on the history of their symptoms, and may also influence treatment outcomes (e.g., time for return to work).

Elements of the physical examination such as inspection, palpation, observation, and specialized neuromuscular evaluation are also reviewed in the AHCPR guideline, and estimates of the sensitivity and specificity of each element in making differential diagnoses are provided (Indicator 2). The guideline concludes that for 95 percent of patients with acute low back problems, no special interventions or diagnostic tests are required within the first month of symptoms.

TREATMENT

There are a wide variety of treatments for low back pain that are currently in use. The clinical care methods reviewed by the panel were patient education about symptoms, structured patient education ("back school"), medications to control symptoms, physical treatments to control symptoms, activity modifications, bed rest, exercise, special diagnostic tests, and surgery. A summary of the panel's findings and recommendations regarding each of these treatment approaches follows.

Symptom Education

The panel recommends educating patients about expectations for recovery and recurrence, safe and effective methods of symptom control, reasonable activity modifications, methods for limiting recurrence of symptoms, the appropriate circumstances for special investigations, and the effectiveness and risks of diagnostic and treatment measures if symptoms persist. The panel indicated that such educational interventions may reduce utilization of medical care, decrease patient apprehension, and increase the speed of recovery.

Medications

The panel concluded that both acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs) were adequate for achieving pain relief; however, acetaminophen may have fewer side effects than NSAIDs. Muscle relaxants were found to be no better than NSAIDs in relieving low back symptoms, while also having more substantial side effects -- especially drowsiness. Opioids were found to be no more effective than NSAIDs or acetaminophen in providing pain relief, with side effects including decreased reaction time, clouded judgment, drowsiness, and risk of physical dependence. A number of other medications (e.g., oral steroids, colchicine, antidepressants) were not recommended for the treatment of low back pain (Indicator 3).

Physical Treatments

Spinal manipulation for patients without radiculopathy is effective in reducing pain and may speed recovery within the first month. The evidence after one month is inconclusive. Transcutaneous electrical

nerve stimulation, lumbar corsets and support belts, shoe lifts and supports, spinal traction, biofeedback, trigger point injections, ligamentous and sclerosant injections, facet joint injections, epidural injections, and acupuncture were not recommended for the treatment of acute back pain (Indicator 4). For patients with radiculopathy, epidural steroid injections were considered an option after failure of conservative treatment and as a means of avoiding surgery.

Activity Modifications

The panel recommended that patients with acute low back problems temporarily limit heavy lifting, prolonged sitting, and bending or twisting the spine. The activity limitations should take into account the age and clinical status of the patient as well as the demands of the patient's job. These modifications should be considered time-limited, which can be emphasized by setting goals for a timely return to normal activity.

Bed Rest

Prolonged bed rest (i.e., more than 4 days) was not recommended because it may increase rather than decrease debilitation (Indicator 5). The panel recommended a gradual return to normal activities and bed rest of short duration only for patients with severe initial symptoms of primary leg pain. A recently published randomized controlled trial found that continuing ordinary activities within the limits permitted by pain led to more rapid recovery than either bed rest or back-mobilizing exercises (Malmivaara et al., 1995).

Exercise

The panel recommended that the initial goal of exercise programs be to prevent debilitation due to inactivity, and then to increase activity tolerance with the goal of returning patients to their highest level of functioning. Exercise programs designed to improve general endurance (aerobic fitness) and muscular strength of the back and abdomen were considered particularly beneficial.

Special Diagnostic Tests

For patients whose symptoms persist longer than one month, in spite of the above-listed recommended treatments, additional diagnostic and treatment procedures may be considered. The tests are of two types: tests for evidence of physiologic dysfunction, and tests for evidence of anatomic dysfunction. Tests in the former category include electromyography, sensory evoked potentials, thermography, general laboratory screening tests, and bone scan. The appropriate indications for and timing of these tests are provided in the guideline document. Tests in the latter category include plain myelography, magnetic resonance imaging, computed tomography (CT), CT-myelography, discography, and CT-discography. These tests must be combined with information from the medical history, physical examination, and/or physiologic tests because the results can be difficult to interpret and many symptomatic patients may not show defects.

Surgery

Lumbar discectomy may provide faster pain relief in patients with severe and disabling leg symptoms who have failed to improve after one to two months of adequate nonsurgical treatment. However, there is little difference in long-term (4-10 years) outcomes of discectomy as compared with conservative care, and the procedure is quite expensive. Among methods of discectomy, direct methods of nerve root decompression were recommended over indirect methods. The role of patient preferences was emphasized, but only if adequate information about efficacy, risks, and expectations is presented.

Surgery for spinal stenosis was not recommended within the first three months of symptoms. Decisions about this surgery should take into account the patient's lifestyle, preferences, other medical problems, and the risks associated with surgery.

Spinal fusion was not recommended during the first three months of symptoms in the absence of fracture, dislocation, or complications of tumor or infection. Spinal fusion was recommended for consideration after decompression in patients with combined degenerative spondylolisthesis, stenosis, and radiculopathy. Patients under age 30

with significant spondylolisthesis and severe leg pain may also be considered candidates for spinal fusion.

FOLLOW-UP

There are no clear indications for routine follow-up of acute low back pain.

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RECOMMENDED QUALITY INDICATORS FOR LOW BACK PAIN (ACUTE)

These indicators apply to men and women age 18 and older. These indicators were not rated by this panel but were endorsed by a prior panel.

Indicator	Quality of Evidence	Literature	Benefits	Comments
Diagnosis				
<p>1. Patients presenting with acute low back pain should receive a focused medical history and physical examination. The history should include questions about “red flags” in at least one of the following areas:</p> <ul style="list-style-type: none"> • Spine fracture: trauma, prolonged use of steroids; • Cancer : history of cancer, unexplained weight loss, immunosuppression; • Infection: fever, IV drug use; • “Red flags” for cauda equina syndrome (CES) or rapidly progressing neurologic deficit are: acute onset of urinary retention or overflow incontinence, loss of anal sphincter tone or fecal incontinence, saddle anesthesia, and global progressive motor weakness in the lower limbs. 	<p>III</p> <p>III</p> <p>III</p> <p>III</p>	<p>Bigos et al., 1994; Deyo et al., 1992; Waddell et al., 1982</p> <p>Deyo et al., 1992; Waddell et al., 1982</p> <p>Deyo et al., 1992; Waddell et al., 1982; Deyo and Diehl, 1988</p> <p>Deyo et al., 1992; Waddell et al., 1982</p> <p>Deyo et al., 1992; Waddell et al., 1982</p>	<p>Prevent disability and potential premature mortality.</p> <p>Prevent debilitation. Reduce pain.</p> <p>Prevent debilitation. Reduce pain.</p> <p>Prevent debilitation. Reduce pain.</p> <p>Prevent permanent neurologic deficit. Reduce pain.</p>	<p>A thorough exam and history will increase the likelihood of identifying serious systemic disease that requires further testing and specialized treatment.</p> <p>Plain film, CT, or MRI of the spine is recommended if spine fracture is suspected. Approximately 4% of patients in primary care will prove to have a spine fracture.</p> <p>CT or MRI is recommended if cancer is suspected. Approximately 0.7% of patients presenting for acute low back pain have primary or metastatic bone cancer, which may be appropriately treated with radiation therapy.</p> <p>Urinalysis recommended if infection is suspected. Approximately 0.01% of patients in primary care will prove to have an infection (e.g., urinary tract infection, skin infection), which may lead to epidermal abscess.</p> <p>CT or MRI recommended if CES or neurologic deficit is suspected. Approximate prevalence of CES among patients with low back pain is 0.0004. A diagnosis of CES requires immediate surgery (or radiation therapy).</p>

Indicator	Quality of Evidence	Literature	Benefits	Comments
<p>4. Patients should NOT be prescribed the following physical treatments for acute low back pain:</p> <p>a. Transcutaneous electrical nerve stimulation (TENS);</p> <p>b. Lumbar corsets and support belts;</p> <p>c. Spinal traction.</p>	<p>I</p> <p>I</p> <p>I</p>	<p>Melzack et al., 1983; Deyo et al., 1990; Gemignani et al., 1991; Graff-Radford et al., 1989; Hackett et al., 1988; Lehmann et al., 1983; Lehmann et al., 1986; Thorsteinsson et al., 1977; Thorsteinsson et al., 1978</p> <p>Coxhead et al., 1981; Reddell et al., 1992; Walsh and Schwartz, 1990; Million et al., 1981</p> <p>Coxhead et al., 1981; Mathews et al., 1987; Mathews et al., 1988; Larsson et al., 1980; Mathews and Hickling, 1975; Pal et al., 1986; Weber et al., 1984</p>	<p>Decrease time to recovery (benefits are inconclusive but the risks are low).</p> <p>Decrease time to recovery.</p> <p>Prevent debilitation.</p>	<p>Evidence on effectiveness is inconclusive. Use of an ineffective treatment may delay recovery if more effective treatments are foregone.</p> <p>No evidence of efficacy in patients with acute low back pain. Use of an ineffective treatment may delay recovery if more effective treatments are foregone.</p> <p>Prolonged traction may lead to debilitation.</p>
<p>5. Prolonged bed rest (> 4 days) should NOT be recommended for patients with acute low back pain.</p>	<p>I</p>	<p>Evans et al., 1987; Postacchini et al., 1988; Deyo et al., 1986; Gilbert et al., 1985</p>	<p>Prevent debilitation.</p>	<p>Evidence suggests that prolonged bed rest may lead to debilitation.</p>

Definitions and Examples

¹ Side effects from long-term use include fluid and electrolyte disturbance, hyperglycemia, pituitary-adrenal function, demineralization of bone, and immunosuppression. High-dose complications include avascular necrosis of bone, myopathy, subcapsular cataract formation, and central nervous system disturbance.

Quality of Evidence Codes

- I RCT
- II-1 Nonrandomized controlled trials
- II-2 Cohort or case analysis
- II-3 Multiple time series
- III Opinions or descriptive studies