

Low Back Pain and Lumbar Disc Degeneration. **[JBJS A 86:1810-1818 (2004)]**

The approach to the management of low back pain has undergone substantial change in recent decades. Low back pain can often present as a difficult problem to solve.

Epidemiology and Natural History

Currently, low back pain is epidemic in the United States. Its annual incidence has been projected to be 5% per year, with an associated prevalence of 60% to 90%.

A patient who has missed work for more than six months has a 50% chance of returning to work, one who has missed more than a year has a 25% chance of returning, and one who has missed two years or more has a <5% chance of returning [Acta Orthop Scand. 1977;170:1 -117]. Low back pain is the leading cause of disability in the largest working population.

Smoking deserves mention. There is an increased incidence of both low back pain and disc herniations in smokers. An et al. found a threefold higher risk of lumbar disc herniations and a 3.9-fold higher risk of cervical disc herniations in smokers [J Spinal Disord. 1994; 7:369 -73]. Nicotine appears to interfere with bone metabolism through induced calcitonin resistance and decreased osteoblastic function. Disc nutrition is impaired by a decreased exchange capacity, with progressive disc degeneration. An autoimmune response may also be involved in progressive disc degeneration in smokers. Furthermore, oxygen levels are reduced in smokers, leading to hyalinization and necrosis of the nucleus pulposus. Outcomes of treatment, operative or nonoperative, are less successful in patients who smoke than they are in those who do not smoke. Cessation of smoking is an important aspect of the treatment of patients with low back pain.

Psychosocial and occupational risk factors often cloud the diagnosis and make it difficult to establish an explainable organic cause of low back pain. Repetitive bending and twisting can increase the risk of low back pain and disc herniation. Additionally, job dissatisfaction or involvement in a Workers' Compensation lawsuit portends a poorer prognosis for recovery.

Non-musculoskeletal causes of low back pain should be considered during the work-up phase. The most common causes are renal and vascular pathology, such as a kidney stone or an abdominal aortic aneurysm.

Lastly, tumors may manifest as back pain. Pain at night and without response to activity or rest, unexplained weight loss, and fatigue should be "red flags" during the work-up for low back pain.

Imaging

Magnetic resonance imaging has had a dramatic impact on the diagnosis and treatment of spinal disease. It is the most accurate and sensitive modality for the diagnosis of subtle spinal pathology, making it the test of choice.

Discography is an invasive, provocative, painful procedure done under fluoroscopic guidance. Contrast medium is injected to pressurize the disc and mimic the pressure of prolonged sitting or standing. While an abnormal appearance, with fissuring and leakage of the contrast medium, is seen on fluoroscopy and computed tomography scanning, the patient's pain response is the most important determinant of the result. Discography, while possibly the best study for identifying the pain generator

Bed Rest

Controversial: some authors have shown that bed rest can provide a benefit with regard to alleviating overall pain, others have shown a quicker return to work with little or no bed rest. The general consensus seems to be that bed rest should be short-term (two days) if used at all.

Medications

Although no analgesic should be promoted as a cure for pain

Prescribing nonsteroidal anti-inflammatory drugs on an as-needed basis is more likely to take advantage of its analgesic effect than to provide the anti-inflammatory benefit that comes with scheduled administration³.

Acetaminophen and opioids are commonly used analgesics but they are associated with substantial risks. While hepatotoxicity is a risk with overdosing, acetaminophen is generally very well tolerated.

Although opioid use is on the rise and can be effective for symptom control, these drugs do not work over the long term and they can lead to other problems. All narcotics are best avoided if possible.

Muscle relaxants play a role in acute back pain and appear to be more effective than a placebo alone. The paraspinal muscle spasm is commonly associated with acute back injuries of various aetiologies and can respond well to these medications.

Antidepressants also have a role in the management of low back pain, especially when there is a comorbid mood disorder. Their concomitant effects as analgesics and antidepressants are particularly useful for individuals in whom back pain would otherwise be increased by depression

Physical Therapy

Specific types of back flexion and extension stretching have been thought to have beneficial effects for patients with low back pain. Flexion-based isometric exercises appear to have the most support in the literature, although extension-based

exercises, progressive-resistance exercises, and dynamic stabilization training are useful adjuncts. They may offer benefit by decreasing local muscle spasm and stabilizing the spine. Currently, however, it is unclear whether one form of exercise therapy is more effective than another, but all seem to provide benefit

In a systematic review of the available literature on the **effectiveness of massage** in the management of low back pain, massage was shown to decrease symptoms and improve function in patients with nonspecific low back pain, especially when the massage was coupled with exercise and education. The ultimate goal should be to involve patients in their back pain management.

Exercise can be supplemented with other modalities, such as transcutaneous electrical nerve stimulation (TENS), which is electrotherapy applied to the low back. The best study to date showed that TENS is no different from a placebo⁴⁷.

Traction Prospective studies have shown, however, that traction is not a means with which to definitively manage low back pain and that it does change its natural history.

Chiropractic Manipulation

Chiropractic manipulation is the most common "alternative" therapy for managing low back pain. It has been estimated that nearly 15% . How chiropractic manipulation provides relief is not fully understood, but it has been shown to have a role in the treatment of acute low back pain.

More patients in the chiropractic group had recurrent symptoms and repeat treatments for low back pain. There is no evidence to support the use of long-term manipulation for the treatment of chronic back pain.

Lumbosacral Orthotic Devices

The purpose of a lumbosacral orthosis is to stabilize or immobilize. Conditions such as vertebral body fracture and spondylolysis with spondylolisthesis as well as the need for postoperative support are all possible indications for prescribing an orthosis.

There is no evidence in the literature to support longterm use of orthotics for the treatment of low back pain.

Selective Injections

Steroids:The epidural space is probably the most common location for selective injections. With fluoroscopic guidance, an interlaminar, caudal, or **transforaminal approach** can be used. Epidural steroid injections are most useful in the treatment of nerve root irritation.

Facet or zygapophyseal joints can be generators of low back pain with referred buttock and lower-limb pain. Use of a controlled injection technique has shown that facet joints can produce low back pain. Extension-based back pain, as opposed to

worse pain with flexion, along with radiographic evidence of arthropathy suggests the presence of facet-mediated pain.

Intradiscal Electrothermal Therapy

Intradiscal electrothermal therapy is used specifically for internal disc derangement, not classic degenerative disc disease.

It is diagnosed with discography and magnetic resonance imaging, the latter of which often shows a high-intensity zone or internal tear in the posterior portion of the annulus. The exact mechanism by which intradiscal electrothermal therapy provides relief is unknown.

Summary

For the initial treatment of acute low back pain, we recommended use of a nonsteroidal anti-inflammatory drug and a muscle relaxant combined with no more than two days of bed rest. Use of the nonsteroidal anti-inflammatory drug should be continued, and physical therapy should be started within a week if possible. The therapy should include stretching, strengthening, and trunk-stabilization exercises. Modalities to relieve symptoms should be used only initially, if at all, to enable the patient to start the exercises. Patient education is an integral part of this active treatment program. The patient should be given the tools with which to continue long-term self-treatment, with injury avoidance and a home therapeutic exercise program. Empowering the patient with the responsibility for self-care is the most effective means of treating low back pain.