



Epidemiology and Natural History of Low Back Pain

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Low back pain is considered acute if its duration is one month or less, whereas chronic low back pain is defined by symptoms lasting 2 months or longer. There is a wide range of causes of acute and chronic low back pain. Common causes of acute low back pain include lumbar strain or sprain, osteoporotic fracture of the vertebra or pelvis, and abdominal aortic aneurysms. Common causes of chronic, or sub-acute low back pain are degenerative disc and joint disease, malignancy, fibromyalgia, polymyalgia rheumatica, Parkinson's disease, Paget's disease, or diffuse idiopathic skeletal hyperostosis. Low back pain is a considerable public health problem that can affect people of any age and socioeconomic class. Understanding the natural history and clinical course of any disease is essential in guiding the decisions about caring for and preventing the disease. However, there is very little known about the natural history of low back pain. Risk factors for low back pain may be genetic, acquired or due to the combination of an individual's interaction with the environment. Prospective studies of predetermined risk factors should be used in the future to more accurately assess their influence on developing low back pain. With enormous economic costs of low back pain exceeding \$100 billion annually, it is of the utmost importance to create strategies for preventing these disorders and their consequences. *Semin Spine Surg* 20:87-92 © 2008 Elsevier Inc. All rights reserved.

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Low back pain is a symptom, not a diagnosis. Often, there is no associated, underlying structural abnormality. Low back pain is best described by the duration and quality of symptoms that accompany the pain. Low back pain is considered acute if its onset occurred less than 1 month ago. The symptoms of chronic low back pain have lasted 2 months or longer. Chronic back pain has also been defined as symptoms present on at least half the days during an extended period.¹

There is a wide range of causes of acute and chronic low back pain. This pain can be triggered by some combination of overuse, strain, or injury to the spine's supporting muscles and ligaments. Acute pain is more typically caused by strains or sprains, osteoporotic vertebral or pelvic fractures, and abdominal pathology. Common causes of chronic or subacute low back pain are degenerative disc disease and fibromyalgia. Chronic back pain may also accompany malignancy, polymyalgia rheumatica, Parkin-

son's disease, Paget's disease, or diffuse idiopathic skeletal hyperostosis.

Both acute and chronic low back pain may be further classified as nonspecific or radicular. Nonspecific low back pain occurs in the absence of neurological symptoms. This pain, which is often due to soft-tissue disorders such as strains or sprains, tends to locate to the midline or paraspinal regions. Radicular low back pain implies spinal nerve root irritation, which may produce neurological symptoms or simply leg pain (radiculitis). Unlike nonspecific back pain, radicular pain syndrome is often accompanied by findings on lumbosacral magnetic resonance imaging.²

In painful mononeuropathies and radiculopathies, the area of pain and sensory abnormality may extend beyond the known sensory distribution of the affected peripheral nerve, or beyond the dermatome of the affected root or dorsal root ganglion, as in postherpetic neuralgia. This phenomenon has been attributed to central nervous system plasticity.

The Natural History of Low Back Pain

Most low back pain episodes are self-limiting: 90% of patients recover in 6 weeks without loss of function.³ Most

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typically, the pain improves considerably within 1 week of an initial presentation. However residual, less severe, back pain often persists for 1 to 3 months. Ongoing discomfort greater than 3 months after initially seeking care is not rare and does not necessarily imply a more serious pathology.⁴ This mild recurrent or subacute low back pain often has little impact on patient's well-being or function, thus leading some authors to argue that functional limitations measure outcomes better than pain level.⁵

Nonspecific low back pain is generally self-limited, but recurrence rates from 40 to 80% have been reported.^{1,6,7} The course of chronic low back pain is highly variable.⁵ Little is known about the natural history of chronic low back pain as most patients presenting with longer term symptoms are offered some form of treatment. It is clear that some percentage of patients experiencing severe, acute low back pain will go on to develop recurrent episodes, with some having continuous symptoms of chronic low back pain for many years.⁴

Few studies have explored the clinical course and prognostic factors in patients with first occurrences of low back pain of less than 3 week's duration. Most reports focus on recurrent acute and subacute low back pain patients. Grotle and coworkers' 2004 cohort study did examine the clinical course of and negative prognostic factors in acute low back pain of less than 3 weeks duration. They recorded sociodemographic characteristics, back pain history and current status, and psychological and clinical health.⁸ At 3 months, 24% of these patients had not recovered. Psychological factors and neurological signs were strongly associated with nonrecovery.⁸ The authors concluded that, in addition to the neurological examination, psychological overlay should be investigated at the initial visit in patient reporting low back pain.⁸

Carey and coworkers found that, of patients who sought care for an episode of low back pain, the risk of developing chronic low back pain was approximately 7.7%.⁹ Once established, chronic low back pain is often persistent, with most patients still experiencing low back pain up to 2 years later with the level of disability reported as moderately severe, as measured by spine-specific and generic functional status scales.⁹ Regardless of the initial care the patients received, failure to improve within the first month after seeking treatment is the best predictor of developing chronic low back pain.^{9,10}

Pain can lead to disability, and the episodic nature of low back pain can lead to limitations in both professional and personal life. To identify workers at higher risk for developing a chronic occupational disability, Fransen and coworkers followed a cohort of workers from a variety of occupations at the time of initial low back pain. Several individual, psychosocial, and workplace risk factors were associated with the transition from acute to chronic occupational back pain.¹¹ In particular, Fransen and coworkers reported that, in workers experiencing severe radiating lower limb pain, at least moderate physical disability or psychological distress had a significantly higher rate of receiving compensation 3 months from the time they made their initial claim for earnings-related compensation. Even when age, gender, and the other psychosocial or workplace risk factor adjustments were in-

cluded, these factors had significant associations with chronic occupational back pain as did jobs requiring lifting for more than three-fourths of the day or those unable to provide light duty on return.¹¹ Reiso and coworkers also found that many individual, psychosocial, and workplace factors are associated with an increased risk of chronic low back pain and predict long-term work absence in disabling low back pain.¹²

Recent economic pressures have placed a greater emphasis on the cost effectiveness of various diagnostic and treatment modalities. Yet, few reports detail the interplay between symptom intensity, variability, and recurrence in low back disability claims.¹³

In 2000 McGorry and coworkers analyzed the course of chronic and recurrent low back pain relative to disability and medication use.¹³ They found that pain levels varied over time. During flare-ups, patients claimed significantly greater disability and medication. Disability and medication use tended to be greater toward the second half of a flare-up.¹³

Prevalence

Affecting both sexes and people of any age or socioeconomic status, low back pain syndromes lead to work absences and enormous increased health care costs. Low back pain is therefore a major economic burden on society and a considerable public health problem.

As a function of how low back pain was defined, North American prevalence studies have yielded rates from 7 to 29%.^{14,15} The reported yearly incidence of low back pain varies between 10 and 28%.^{6,7} While approximately 75% of adults will experience low back pain at least once in their adult life, 25 to 39% seek care.^{16,17}

Deyo and coworkers report that low back pain is the most common type of pain reported by adults in the United States with 26.4% reports of back pain lasting at least a day in the past 3 months.¹⁸ Back pain was more common among adults over the age of 45, women, and American Indians and Alaska Natives. Asian Americans had the lowest prevalence, while whites, blacks, and Hispanics were between these outlier groups.¹⁸ Low back pain prevalence in those with only a high school diploma was 32% compared with 22% among those with a bachelor's degree or higher. Similarly, the prevalence decreased with increasing levels of income. Finally, the prevalence of back pain was highest among widowed adults and lowest among those who had never married.¹⁸

In Carey and coworkers' 1996 study, 39% of adults who had experienced at least one occurrence of acute severe low back pain sought medical care in some form.¹⁷ For every 100 workers seeking care, there were two Workers' compensation claims.¹⁷ Care-seeking behavior varied as a product of cultural factors, comorbidities, pain intensity, and the extent of activity limitation. Patients often seek care regardless of income and insurance status.

Low back pain is not rare in children and adolescents. A growing body of evidence shows that low back pain starts between 8 and 10 years of age.¹⁹ With a threshold of at least 30 days in the previous year, one study of adolescents and

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