

## Low back pain - an introduction

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### Abstract

Low back pain affects up to 80% of people some time in their life, and about 8% report severe pain in the previous year. It is associated with psychological distress. It is a major cause of work loss and burden to the community. In 85% of patient with low back pain presenting to primary care, no clear diagnosis is established. Red flags may be used to distinguish between non-specific low back pain, pain that is associated with radiculopathy or spinal stenosis, and pain that is associated with another spinal cause including serious underlying condition. This distinction is important in planning appropriate investigation and management, which are different for each group. Yellow flags indicate psychosocial barriers to recovery, which should be identified and addressed early. For non-specific low back pain, management includes encouraging patients to recognise their own role in recovery by maintaining a positive attitude, avoiding excessive bed rest, and maintaining activity. Treatments for pain relief are gaining support from evidence, and guidelines are increasingly including recommendation for acupuncture in patients in whom other treatments have failed.

### Introduction

The aim of this article is to summarise information on low back pain to provide a background to the potential place of acupuncture in management of the problem. The article principally concerned with adults, and information given may not apply to special groups such as children and adolescents, pregnant women<sup>1</sup>, and patients with non-spinal back pain (e.g. fibromyalgia, other myofascial syndromes). This article mainly relates to low back pain, though some of the information also applies to pain in other spinal areas such as thoracic or cervical pain. Sources for this article are shown in Box 1.

### Definitions

Low back pain (LBP) means pain experienced dorsally between the costal margins and the gluteal fold. Sciatica means pain radiating down the back

of the leg below the knee (though patients often use the word to indicate any leg pain) in the distribution of the sciatic nerve. Sciatica suggests nerve root compromise due to mechanical pressure. Sciatica refers to the pain, whereas radiculopathy refers to dysfunction of the nerve root associated with pain, sensory impairment, weakness or diminished deep tendon reflexes in a nerve root distribution.

Acute LBP is generally used to mean pain of less than 4 weeks and chronic LBP of more than 3 months, with subacute between 4 weeks and 3 months.

Non-specific low back pain is low back pain in which the cause of the pain cannot be attributed to any specific pathology. Sprains and strains of the back are also considered to be non-specific low back pain. Degenerative changes on lumbar imaging are generally regarded as non-specific as they correlate poorly with symptoms.

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**Box 1 Main sources used for this article**

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 Oxford Textbook of Rheumatology. Chapter 6, Disorders of the Spine. IV Jayson. OUP, 2004

**Natural history**

Most patients with a new episode of LBP recover quickly and without residual functional loss. However, recurrence is common, some 60-90% suffering a relapse, with each recurrence having the potential to be more severe and long-lasting. In any new episode, between 60% and 70% recover within six weeks, and 80-90% recover within three months. However, for the 10-20% who do not recover within three months, the recovery process is slow and makes a large and costly demand on the health-care system. This group of individuals is also a major contributor to disability and absence from work.

**Prevalence and community burden**

Low back pain is extremely common, although precise figures for prevalence vary between studies because of variations in definition and other factors. It affects about one in seven of the British population at any one time, one in three in the previous year, and about 50 to 80% of people sometime in their life. In the US, approximately a quarter of all adults report having LBP for at least one day in the last 3 months, and 8% reported one episode of severe LBP in the last 12 months.

The peak prevalence is between 45 and 59 years although it is also common in the young and in the elderly<sup>2)</sup>. There is little difference in the prevalence of back pain and disability between men and women, but there is a positive correlation with lower social class.

The onset of LBP is often reported after an accident or injury, although a causal link may be difficult to demonstrate. There is evidence that repeated

flexion and rotation of the trunk and lifting at work are moderate risk factors for low back pain. Work-related injuries are common and the highest incidence of LBP appears in the construction industry, agriculture, and in health care staff. Obesity is often blamed as a cause of back problems, but there is little evidence to support this view.

Psychological distress is common in patients with chronic LBP with disability. In a prospective study of a back pain free population, symptoms of psychological distress predicted future development of new episodes of LBP<sup>3)</sup>. Indeed, it was estimated that the proportion of new episodes of LBP attributable to psychological factors in the general population is 16 per cent. The problem is aggravated by claims for compensation and there is little doubt that patients involved in medico-legal claims of one sort or another report greater pain, depression, and disability than those not involved.

In Britain, in 1993, the total work loss was estimated as approximately 150 million days. There was a dramatic increase in the level of disability due to back problem in the 1990s, without any increase in the numbers of back related injuries. It seems likely that psychosocial factors play a major role in this increase. In recent years the rate of increase has slowed.

The costs of back problems are huge and exceed the costs of many other conditions and diseases. In Britain, in 1993 the total cost of LBP was estimated to be some £ 6.5 billion<sup>4)</sup>. In the United States in 1990, the cost of LBP was estimated to be between \$25 and \$100 billion<sup>5)</sup>. Approximately 2% of the workforce are compensated for back pain each year. In the Netherlands in 1991, the total direct medical costs were estimated at US\$368 million and the total cost of absenteeism and

disability payments (indirect costs) at US\$3.1 and US\$1.5 billion, respectively. Approximately 5% of the people with LBP account for 75% of the costs.

### Aetiology

In 85% of cases presenting to primary care, no precise diagnosis of the cause of pain is ever achieved. A great variety clinical diagnoses such as muscle strain, degenerative disc disease, facet syndrome, myofascial pain syndrome, segmental instability, minor intervertebral displacement, iliolumbar syndrome, piriformis syndrome, etc. have been described within this broad category based on the symptoms, signs and hypotheses. However, these diagnoses not reproducible even by experienced clinicians.

In view of the mechanical forces which the human spine has to undergo in its roles of bearing the weight of the upper structures of the body, providing flexibility for movements, and protecting vital structures, it is inevitable that degenerative changes will occur. However, the presence of such changes does not strongly correlate with symptoms.

The locations of nociceptive receptors that may be involved in LBP are shown in Box 2. In addition, many patients with chronic low limb pain show evidence of sympathetic dysfunction. The sympathetic chains run alongside the vertebral column forming multiple anastomoses, and sympathetic nerves accompany blood vessels into the lower limbs.

### Diagnosis: history and examination

The initial aim of clinical examination is to place patients in one of three broad categories:

- Non-specific LBP (typically >85% of those who present in primary care)
- LBP potentially associated with radiculopathy or

spinal stenosis

- LBP potentially associated with another spinal cause including serious other underlying conditions.

The well known cauda equina syndrome is commonly associated with massive midline disc herniation, but is extremely rare (0.04%).

It is conventional in some settings to use a system of flags to assist clinical judgement (see Box 3). Red flags indicate the possibility of serious underlying disorder; and 'yellow flags' indicate risk factors for developing or persisting chronic pain and long-term disability. There is no benefit to patients with non-specific LBP in routinely ordering imaging or other diagnostic tests, but the other two groups should be investigated or referred to secondary care, with appropriate urgency.

### Investigations

In the UK, recommendations for ordering a radiograph in a patient presenting with back pain include the following: age over 50, fever, weight loss, significant trauma, previous history of neoplasia, use of corticosteroids, drug or alcohol abuse, neurological symptoms and signs, particularly if widespread, night pain, morning stiffness (in which case a pelvic rather than a lumbar radiograph is recommended to detect sacroiliitis), and the persistence of pain after one month of conservative therapy.

In patients with persistent pain, those with signs or symptoms of radiculopathy or spinal stenosis should be investigated with MRI or CT if they are potential candidates for surgery. Many radiologists consider MRI to be the imaging modality of choice for the diagnosis of lumbar disorders. It provides a unique non-invasive means of studying the spine and is unsurpassed for imaging soft tissues. It is particularly helpful in the evaluation of spinal cord

### Box 2 Location of nociceptive receptors of low back pain

Box 2 Nociceptive receptors that may be involved in low back pain are found in:

- the skin and subcutaneous tissues,
- the fibrous capsules of the apophyseal and sacro-iliac joints,
- the outer layers of the annulus fibrosus,
- the longitudinal ligaments of the spine and in particular the posterior longitudinal ligaments,
- the periostium and attached fasciae, aponeuroses, and tendons,
- walls of blood vessels in and around the spine,
- the dura mater and epidural adipose tissues.

**Box 3 Red and yellow flags for management of low back pain****Red flags for the cauda equina syndrome include:**

Saddle anaesthesia.  
 Recent onset of bladder dysfunction or faecal incontinence.  
 Major motor weakness.

**Red flags that suggest spinal fracture include:**

Sudden onset of severe central pain in the spine which is relieved by lying down.  
 Major trauma such as a road accident or fall from a height.  
 Minor trauma, or even just strenuous lifting, in people with osteoporosis.  
 Structural deformity of the spine.

**Red flags that suggest cancer or infection include:**

Onset in a person over 50 years, or under 20 years, of age.  
 History of cancer.  
 Constitutional symptoms, such as fever, chills, or unexplained weight loss.  
 Intravenous drug abuse.  
 Immune suppression.  
 Pain that remains when supine; aching night-time pain disturbing sleep;  
 and thoracic pain (which also suggests aortic aneurysm).

**Yellow flags are psychosocial barriers to recovery include:**

The belief that pain and activity are harmful.  
 Sickness behaviours, such as extended rest.  
 Social withdrawal, lack of support.  
 Emotional problems such as low or negative mood, depression, anxiety, or feeling under stress.  
 Problems or dissatisfaction at work.  
 Problems with claims for compensation or applications for social benefits.  
 Prolonged time off work (e.g. more than 6 weeks).  
 Overprotective family.  
 Inappropriate expectations of treatment, such as low expectations of active participation in treatment.

tumours, as well as infections of the spine, including discitis, epidural, and paraspinal abscesses. Computed tomography is superior to MRI for the evaluation of bony structures and therefore is the modality of choice for spinal stenosis, particularly when combined with myelography.

Injection studies done under fluoroscopic guidance are the only means of diagnosing back pain of discal, zygoapophyseal, or sacroiliac joint origin.

**The approach to treatment**

Management recommendations in the UK changed abruptly in the mid-1990s in response to new evidence<sup>6</sup>. The old regime was routine radiology, bed rest, immobilisation with corset, and traction. The new regime became imaging only when

indicated, bed rest only when absolutely necessary for pain relief and then for only short periods, maintain activity, and avoid traction. In addition, the crucial influence of psychological factors into chronicity and prolonged work absence were first overtly identified and explored, and the need to include psychological management was recognized.

One particularly major change in recent years has been the shift in emphasis from the patient as a passive recipient of 'treatment' to an active participant in 'active management'. Health professionals have an important part to play in not encouraging patients to rely on interventions that will 'cure their pain', but to adopt healthy lifestyle, postures, exercise and activities that will restore and maintain symptom-free lumbar spine.

Information on this management approach are now

widely available. Practitioners should provide information and advice to foster a positive attitude and realistic expectations, avoiding negative language. They should:

- **Help people understand the problem** by providing accurate and positive information
- **Help people understand the treatment**, particularly that the responsibility for managing symptoms is shared between the person and the healthcare professional.
- **Recovery** is helped by getting moving again and getting back to work as soon as possible. Medication can be taken to relieve the pain. Bed rest should not be prolonged any longer than is necessary, and normal activities should be resumed as soon as possible. Many normal postures and movements will stimulate a little pain, which is normal and not harmful to progress, and to ensure that pain is kept within tolerable limits, resumption of normal activities should be paced by conducting them at a reduced level or slower rate.
- **Return to work as soon as possible**, as there is no need to wait for complete freedom from pain. Returning to work helps to relieve pain by getting back to a normal pattern of activity and providing a distraction from the pain.

There is good evidence from a systematic review on the general factors that can make a clinical consultation effective<sup>7)</sup>, including rapport, setting the agenda for the consultation up front, and acknowledging social and emotional cues can improve the quality and efficiency of care.

### Conservative interventions including acupuncture

There is strong evidence for the effectiveness of analgesics, non-steroidal anti-inflammatory drugs, and muscle relaxants<sup>8)</sup>. Acupuncture is increasingly being included in treatment guidelines. It is increasingly understood as a form of neurophysiological stimulation<sup>9)</sup>.

The German health insurance companies made an evidence-based decision to reimburse acupuncture treatment<sup>10)</sup>. The evidence from a large study in which acupuncture was superior to guideline care based on evidence<sup>11)</sup> was influential.

The UK's National Institute for Health and Clinical Effectiveness, (NICE) have published draft evidence based guideline which is currently under

review for final publication. The draft guidelines include the sentence: 'Consider offering a course of acupuncture needling comprising up to 10 sessions over a period of 12 weeks.'

In the US, the consensus recommendations of the American College of Physicians and American Pain Society include acupuncture for patients with subacute or chronic back pain who do not improve with self-care options<sup>12)</sup>. Other interventions recommended for this group of patients include intensive interdisciplinary rehabilitation, exercise therapy, massage therapy, spinal manipulation, yoga, cognitive-behavioural therapy or progressive relaxation. It is the subject of intensive and increasingly high quality clinical research, which is presented and discussed in companion articles.

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