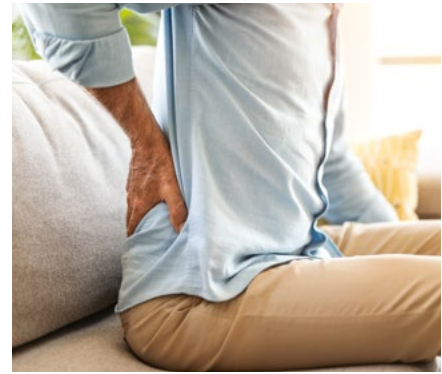


Non-radicular low back pain

Assessment and evidence-based treatment



CPD 

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Background

Low back pain (LBP) is a common presentation in general practice. Clinical workup must exclude sinister underlying diseases. Treatment of central LBP is difficult given the numerous treatment options available.

Objective

The aim of this article is to help clinicians assess patients with LBP and formulate evidence-based treatment decisions.

Discussion

Patient presentations can be stratified according to the presence of red flags and pain type (ie non-spinal, radicular, non-organic and central). The vast majority of patients with acute central back pain experience improvement of their symptoms. Treatment options include education, lifestyle modification, heat, massage, graduated return to early activity, nonsteroidal anti-inflammatory medications and muscle relaxants when appropriate. Chronic LBP treatment can also include paracetamol and physiotherapy. Second-line treatment can include psychological therapy, multidisciplinary rehabilitation, targeted injections and antidepressants. Tapentadol is a safe and effective medication for treating severe LBP. Pain specialist referral should be considered if patients require controlled analgesia. Surgical treatment has narrow indications in central non-radicular back pain and is considered as a last-line treatment in selected patients.

LOW BACK PAIN (LBP) is a common condition affecting up to 84% of adults at one stage during their lives,¹ accounting for a significant burden of disease. LBP can be classified as acute, subacute and chronic (>6 weeks). While 90% of patients recover from an acute period of LBP, recurrences are common.² It is estimated that 32% of patients with back pain will not return to work at one month, and this cohort is at risk for long-term work absence.³ History and examination generally allow the clinician to stratify patients into those with red flags and by the nature of pain (non-spinal, radicular, non-organic or central LBP). Further investigation and management can then be guided by the relevant category of pain. Patients will often present with features of multiple categories, and priority is given to ruling out sinister causes first.

Sinister red flags for spinal tumours, fracture, infection and cauda equina syndrome need to be excluded (Table 1). It is recommended that a spinal surgeon urgently assesses patients with positive findings. Pain profile distinguishes between central and radicular pain. Transverse LBP radiating to sacroiliac joints can originate from the intervertebral disc. Pain radiating to the buttocks or posterior thigh can originate from facet joints. Radicular leg pain can be described on the basis of

dermatomal distribution. It is important to consider non-spinal pathology, such as hip arthritis and intra-abdominal pathology. Non-organic causes are suggested in patients with non-anatomic findings, superficial tenderness, pain with axial loading and non-sustained power. The following discussion will focus on non-radicular LBP.

Pathophysiology

In the ageing spine, the disc desiccates and the annulus fissures. Disc narrowing can de-tension the posterior ligamentous structures and lead to periods of microinstability. The facet joints respond to the increased stresses by undergoing hypertrophy and facet degeneration. Pain generation can occur at multiple anatomical sites.

The intervertebral disc can generate pain through the annulus fibrosis. Annulus tears and pro-inflammatory nuclear material cause mechanical and chemical irritation of the sinuvertebral nerve. Facet degeneration can result in pain generation through the activation of the medial branch. Spinal instability can enhance pain generation. Degeneration commonly occurs at multiple levels, making identification of noxious stimuli difficult. If no pathoanatomic cause is found, treatment is directed towards pain reduction and functional improvement.

Clinical assessment

The focus of history-taking is pain profile, functional limitations and stratifying patients into the aforementioned categories. It is recommended that examination includes range of movement, sagittal and coronal alignment, nerve root tension signs, abdominal palpation and full neurological examination.

Indications for imaging include patients with red flags, abnormal neurology or pain lasting >4 weeks. Erect plain radiographs can be used to define spondylosis, spondylolisthesis and scoliosis. Importantly, sclerosis, osteophyte formation and loss of disc height indicate a degenerative process. If there is ongoing pain or concerns, advanced three-dimensional imaging with computed tomography (CT) and/or magnetic resonance imaging (MRI) is appropriate. CT is often the imaging modality of choice when access to MRI is limited. The authors suggest early imaging with MRI, under the guidance of an orthopaedic spine surgeon, if the patient has severe unremitting radicular pain, abnormal neurology, red flags or failed non-operative treatment. The correlation between MRI disc disease and LBP is low and therefore warrants cautious interpretation.⁴ Nuclear imaging, discography and dynamic radiographs can be useful for surgical workup.

Table 1. Red flags for back pain

Tumour	History of cancer Weight loss Night pain Age >40 or <15 years
Fracture	History of trauma Risk factors for fragility fracture
Infection	Fever >38.0°C Night sweats/chills Immunosuppression Intravenous drugs Concomitant infection
Cauda equina syndrome	Urinary retention Saddle anaesthesia Worsening neurology – flaccid paralysis

Treatment

There are many treatment options available to the clinician (Table 2). No treatment has been shown to be superior; as a result, multimodal therapy is the cornerstone of treatment. The individualisation of treatment is based on best evidence, physician experience and patient preference.

Non-pharmacological

Patient education regarding aetiology, prognosis and treatment options is paramount for treating LBP. Prognosis is favourable with long-term treatment programs focusing on symptomatic relief. Educational material may be individually useful but has not been shown to improve outcomes.⁵ Cold packs can be used in the acute inflammation phase, while hot packs can be used in the chronic muscle spasm phase. Massage can improve pain, depression and sleep in the medium term.⁶

It is recommended that activity modification be done in phases. A period of light activity and avoidance of painful activities is appropriate for several days. However, bed rest is not recommended.⁷ An early return to low-stress aerobic activity and work improves pain tolerance, mood and strength in chronic LBP.⁸ Physiotherapy-directed strengthening and posture control can start after the acute period and continue indefinitely. Core exercises are more effective than general exercise for decreasing pain and increasing function.⁹ It is important to emphasise long-term weight reduction, with a loss of ≥5% body weight reducing the prevalence

of LBP.¹⁰ Given the low-risk profile of the above treatments, they can be beneficial for all patients.

Psychological therapy, such as cognitive behaviour therapy and progressive relaxation, has been shown to result in a moderate improvement in pain.^{10,11} Multidisciplinary rehabilitation combines psychological therapy, physical therapy, occupational therapy and social work. A systematic review¹² of 41 trials of patients with LBP for longer than three months found rehabilitation improves pain and disability in the short- and long-term when compared with usual treatment. This can be considered for patients with difficult-to-treat chronic LBP.

Acupuncture and chiropractic and spinal manipulation are treatments that differ greatly in how they are performed, making effectiveness difficult to assess. A systematic review found acupuncture superior to placebo in the short term.¹³ There was no reliable difference in pain or function when compared with active conventional treatment for chronic LBP. Adverse effects are often mild and transitory, such as bleeding, swelling or light-headedness. Acupuncture can be considered as part of a treatment regimen at the patient's request. Chiropractic interventions do not appear to be beneficial for chronic LBP when compared with standard treatment.¹³ A systematic review found a small benefit for spinal manipulation when compared with placebo, but it is not superior to conventional treatment.¹⁴ Given the rare but catastrophic risk from

Table 2. Recommendations for treating chronic low back pain

First-line treatment	Second-line treatment	Third-line treatment
<ul style="list-style-type: none"> • Education • Early return to activity • Weight loss • Exercise/physiotherapy • Nonsteroidal anti-inflammatory drugs • Tai chi/yoga/Pilates • Paracetamol • Acupuncture 	<ul style="list-style-type: none"> • Multidisciplinary rehabilitation • Psychological therapy • Antidepressants* • Injections – facet/epidural 	<ul style="list-style-type: none"> • Tapentadol • Surgery

*Consider as first-line treatment if patient has chronic back pain and depression.

disc herniation leading to cauda equina syndrome (1:1 million), caution should be exercised before recommending spinal manipulation. No reliable evidence is available to support the routine use of orthoses, braces, corsets, prolotherapy or magnets in LBP.¹⁵

Pharmacological

Paracetamol, nonsteroidal anti-inflammatory drugs (NSAIDs), muscle relaxants and antidepressants can be used to treat LBP because of their low-risk profile. Paracetamol is a relatively safe medication for mild-to-moderate chronic LBP. However, paracetamol does not appear to be beneficial for patient with acute LBP when used in isolation. A Cochrane review showed that NSAIDs are more effective than placebo for reducing pain and disability without increased adverse events.¹⁶ While there is no difference in efficacy between NSAIDs, cyclooxygenase-2 (COX-2) inhibitors are effective and have fewer side effects when compared with traditional NSAIDs.

Antidepressants can be used in cases of chronic LBP. A systemic review showed reduced pain but no difference in global outcome with antidepressants when compared with placebo.¹⁷ Efficacy is improved if the patient has concomitant depression. Tricyclic antidepressants appear to work better than serotonin reuptake inhibitors.¹⁸ Muscle relaxants, such as baclofen, benzodiazepine and cyclobenzaprine, appear to be more effective than placebo in reducing acute symptoms. When used in conjunction with NSAIDs, there is an additive effect.¹⁹ There is no strong evidence for the superiority of any specific muscle relaxant. The authors consider a short course of low-dose diazepam to be reasonable in patients with acute LBP and back spasm. The significant side effects, including drug abuse, dependence and drowsiness, preclude long-term use or higher doses. Corticosteroids have no advantage over placebo for the treatment of LBP without radiculopathy.²⁰ Severe side effects preclude their use except in exceptional cases.

Injection of local anaesthetic and corticosteroids may be useful for

diagnostic and therapeutic purposes. Facet joint arthropathy can cause significant pain radiating locally. Intra-articular facet injections can be used for diagnostic and therapeutic reasons, although effectiveness is questionable without the addition of local anaesthetic.²¹⁻²³ The evidence is more robust for lumbar facet nerve blocks, which can provide reasonable mid-term relief.²¹ In a patient with a good response to injections, longer-term relief may be gained by radiofrequency ablation of the facet joint nerves.²¹ Caudal injections can provide short-term relief of LBP²⁴ in acute exacerbations or if temporary relief is required. Nerve root injections are reserved for patients with radicular pain, and are beyond the scope of this article.

Tramadol and tapentadol are opiate-like medications that can be used cautiously in patients with severe LBP. A systematic review of tramadol found mild improvement in short-term pain and function when compared with placebo.¹⁷ Tramadol and tapentadol should be used cautiously in patients taking opiates or monoamine oxidase inhibitors, those with renal impairment and elderly patients. More than 10% of patients will experience significant headaches and/or nausea.²⁵ Tapentadol is a centrally acting opiate agonist and noradrenaline reuptake inhibitor. A Cochrane review found that tapentadol is effective for treating musculoskeletal pain, such as chronic LBP.²⁶ Recent review articles have suggested that tapentadol is safe and efficacious in the treatment of chronic LBP.^{27,28}

It is recommended that opiate medication be used sparingly and only for acute, difficult-to-control pain. It is associated with serious adverse effects, drug misuse, dependency and variable efficacy. A large meta-analysis of 20 randomised controlled trials examined the effects of opiates on chronic LBP.²⁹ Medications analysed included oxycodone, hydrocodone, hydromorphone, morphine and fentanyl. The patient withdrawal rate was 50% because of adverse effects or lack of efficacy. Patients who tolerated opiates had small short/intermediate-term improvements in pain. When opiates

were compared with NSAIDs, no superior effect was identified.²⁵ If patients require controlled medications, pain service review is recommended.

Surgery

Surgery for LBP can be considered for patients who have unremitting pain and functional limitation for >1 year. Patients should maximise a comprehensive non-operative treatment regimen. Motion-preserving disc arthroplasty theoretically reduces stress and subsequent degeneration at adjacent levels. However, spinal degeneration is most commonly treated with a fusion procedure. This can be achieved by laying a bone graft posterolaterally or in the disc space, with or without instrumentation. Interbody fusion involves fusing the disc space from the front (anterior lumbar interbody fusion), side (oblique or direct lateral lumbar interbody fusion) or posterior (posterolateral or transforaminal interbody fusion). Studies have reported varied clinical success rates from 40% to 90%.^{30,31} Inconsistent results may be due to variable surgical indications, pathologies and surgical treatments. Patient selection is paramount for improving clinical outcomes.

Conclusion

LBP is a common presentation in general practice. It is essential that clinicians exclude sinister underlying diseases. The vast majority of patients with acute central LBP experience improvement of their symptoms. Treatment options include education, lifestyle modification, heat, massage, graduated return to early activity, NSAIDs and muscle relaxants. Chronic LBP can also benefit from paracetamol and physiotherapy. Second-line treatment can include psychological therapy, multidisciplinary rehabilitation, targeted injections and antidepressants. Tapentadol can be considered for pain that is difficult to control. Opiates should be used sparingly, and early pain specialist referral considered. Surgical treatment has narrow indications in central non-radicular back pain and is generally only considered as a last-line treatment in selected patients.

Key points

- Patients with LBP can be stratified according to presence of red flags and pain type (ie non-spinal, radicular, non-organic and central).
- MRI is recommended if the patient has radicular pain, neurology or red flags, or if they have failed non-operative treatment.
- Pain reduction and functional improvement are the main aims of treatment.
- Treatment options include education, NSAIDs, paracetamol and physiotherapy.
- Antidepressants are effective for chronic LBP, especially for patients with depression.
- Tapentadol is a safe and effective medication for treating severe chronic LBP.
- Pain service referral is recommended if patients require controlled analgesics.

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