

The significance of chronic back pain

Chronic back pain can be a sign of a serious disorder but more often it is due to an unspecified mechanical dysfunction. It can usually be managed effectively with exercise and use of analgesics.

LES BARNSELY

BMed (Hons), FRACP, Grad Dip
Epi (Clin), PhD, FAFRM(RACP)

Associate Professor Barnsley is a Consultant Rheumatologist at Concord Repatriation General Hospital, Department of Rheumatology, Concord, NSW.

Back pain is a near universal human experience with more than 70% of people reporting significant episodes of back pain at some point in their lives. For most individuals, back pain is short lived and not disabling. The significance of back pain lies in the possibility that it is indicative of a serious underlying disorder. People with chronic disabling pain endure significant personal suffering while incurring significant expense to themselves and society as a whole. These patients are the focus of this article.

Most cases of back pain are due to unspecified mechanical dysfunction and not to serious underlying medical disorders such as infection or malignancy. It is usually not possible to determine the specific structure or pathology responsible for back pain in a given individual. This pertains to the situation in patients with acute or chronic back pain. Of the putative sources of back pain,

including discogenic disease, zygapophyseal joint arthritis and muscle injury, there are no established clinical features that allow one entity to be distinguished from the others.

To date, there have been no population-based estimates of the relative contribution of different types of pathology to the burden of back pain. In a selected, referred population of US patients undergoing investigations for chronic back pain, pain arising from the intervertebral discs, diagnosed by provocation discography, was the most common identifiable cause of chronic low back pain, accounting for about 30% of cases. Pain from the sacroiliac joints or zygapophyseal joints was far less common, accounting for between 10 and 15% of cases of chronic low back pain. However, a substantial number of patients referred for assessment of back pain did not have an anatomical source identified.

IN SUMMARY

- More than 70% of people report significant episodes of back pain at some point in their lives.
- A patient with uncomplicated back pain, no history suggestive of a serious underlying disorder and no history or examination findings suggestive of neurological involvement does not warrant further investigation.
- Imaging of patients with chronic back pain should not be performed in a nontargeted fashion.
- There is good evidence that a range of exercise interventions are effective for decreasing the frequency of recurrences of back pain.
- Short-term use of analgesics and NSAIDs in patients with acute exacerbations of low back pain can facilitate maintenance of activity.

Without the ability to clinically identify a specific painful structure, the role of the clinician in the assessment of a patient with back pain is to determine if back pain is a presenting feature of a serious underlying disorder and to exclude any neurological involvement. The assessment of the patient with back pain is accomplished through clinical assessment. If the patient does not have evidence of an underlying disorder or neurological involvement then the further responsibility of the clinician is to investigate and institute appropriate interventions to help manage the patient's pain.

Eliminating serious underlying causes

Fortunately, serious underlying causes of back pain are rare. The types of conditions that may cause patients to present with back pain include:

- infection (bacterial or fungal)
- inflammatory disease such as ankylosing spondylitis
- malignancy
- metabolic bone disease such as Paget's disease
- vertebral fractures.

Correctly identifying these conditions allows specific targeted therapy to be instituted.


In the primary care setting, tumours have been shown to account for less than 0.7% of cases of low back pain. Infection is even less likely, with a prevalence of 0.01%.¹ A past history of cancer or the presence of marked anaemia are the strongest single risk factors for malignancy being present as a source of low back pain. A history of elevated temperature or fever is strongly suggestive of infection.

There are usually other clinical clues that the person with chronic back pain is unwell or has nonmechanical pain. These features are known as red flags and should prompt assessment for serious underlying conditions (Table). Due to the low frequency of such conditions, the predictive value and accuracy of these features remain uncertain, but they provide a useful means of considering diagnostic possibilities other than unspecified back pain.

Neurological involvement

The presence of neurological symptoms or signs in patients with chronic back pain indicates compression or compromise of nerves either within

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Back pain affects more than 70% of people at some point in their lives. It is usually self-limiting and not disabling. Back pain becomes a significant condition when it is indicative of a serious underlying disorder.

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or as they exit the spinal canal. In the lumbar spine, the most common cause of radiculopathy is intervertebral disc prolapse. However, in older patients, foraminal stenosis caused by a combination of disc and intervertebral endplate disease and osteoarthritic changes of the zygapophyseal or facet joints can lead to compromise of the exiting nerve roots. Patients typically present with back pain and leg pain that is shooting or electrical in quality, and localised to a thin band across the leg. Paraesthesiae and altered sensation over a single dermatome are typical. More severe nerve root compression can lead to weakness or loss of reflexes.

Table. Red flags to identify a serious underlying cause in a patient with chronic back pain

Pain characteristics

- Highly localised
- Prominent diurnal variation – especially prolonged early morning stiffness
- Uninfluenced by posture or movement
- Improved rather than worsened by activity

Examination

- No restriction of spinal movement or restriction at one segment
- Localised tenderness

Other features

- Loss of weight
- Fever
- Marked anaemia
- Peripheral arthritis
- Symptoms in other systems (e.g. change in bowel habit, breast mass or cough)
- Past history of malignancy

Examination findings

In the absence of red flags or neurological symptoms, physical examination of the patient with nonspecific back pain is of limited usefulness. Findings on examination of the spine are limited to alterations in range of motion and tenderness. There are no established relations between specific physical findings and pain arising from any particular structure. Nevertheless, a careful examination may serve to reassure a patient and aids in establishing a therapeutic rapport.

Assessment should include evaluation of gait, and evaluation of spinal posture and symmetry while the patient is standing. The most important movements to be assessed are flexion, extension and lateral flexion of the lumbar spine. The

patient is asked to touch his or her toes, bend backwards and slide his or her hand down the outside of either leg. Palpation of the spine can be performed with the patient either erect or lying prone.

Neurological examination of the lower limbs is essential. A positive nerve tension test involves the reproduction of typical pain down the leg by dorsiflexing the ankle while the leg is raised at an angle less than 60°. Straight leg raising, with the patient in a supine position, involves passively flexing a straight leg at the hip with a fixed pelvis. Pain reproduction in the back is often reported but is not indicative of a positive straight leg raise test in the absence of leg pain. Positive straight leg raising is sensitive but not specific for nerve root compression. A crossed straight leg raise test, where the patient's usual pain in the leg is reproduced by raising the contralateral leg, is specific but not sensitive for nerve root compression.

Further examination should include abdominal examination and hip movements. Peripheral joints should be assessed for inflammation. Other assessments, such as pelvic examination, should be performed if suggested on history.

Investigations

No further investigations are warranted in a patient with uncomplicated back pain, no history suggestive of a serious underlying disorder and no history or examination findings suggestive of neurological involvement. Plain x-rays have not been shown to influence management of the patient.² Numerous studies have demonstrated a poor and unreliable relation between back pain and degenerative, osteoarthritic or spondylitic changes in x-rays of the lumbar spine.

Prospective assessment of the findings seen on x-ray shows that the changes seen in the lumbar spine increase in frequency with increasing age. At the same time the very terms used to describe spinal changes, such as 'degenerative', have the potential

to alarm and distress patients, particularly those who fail to follow the requests on the stickers sealing the radiologist's report inside the x-ray bag that the envelope should 'only be opened by the referring doctor'. These findings can be explained as being similar to wrinkles or gray hair – they occur more frequently with increasing age and vary in severity from person to person.

In a comprehensive systematic review of observational studies considering the relation between spinal radiographic findings and nonspecific low back pain, spinal degeneration was found to be associated with low back pain in the past 12 months with an odds ratio of 1.2 to 3.3.³ Stated another way, patients with back pain are twice as likely to have degenerative spinal changes as patients without back pain. At best this is a modest association and in an individual patient it holds little weight. No association was found between low back pain and the presence of spondylolysis, spondylolisthesis, spina bifida, transitional vertebrae, spondylosis or Scheuermann's disease.

Cross-sectional imaging such as magnetic resonance imaging (MRI) or computed tomography (CT) scanning of the lumbar spine is indicated only for the evaluation of neurological symptoms or impairments, specifically radiculopathy or myelopathy. Imaging should not be performed in a nontargeted fashion. Requests for such investigations from patients who believe that imaging will reveal a cause of their back pain should be resisted and careful explanation of the limitations of such an approach discussed with patients. Studies of MRI scans have revealed that they show a high prevalence of abnormalities unrelated to current symptoms. For example, more than half of 40-year-old individuals had reduced disc height and between 25 and 50% had annular tears, disc protrusions, endplate changes or zygapophyseal joint degeneration, among other abnormalities.⁴

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Preventing chronic back pain

Patients with back pain remain difficult to treat, so there has been considerable interest in the prevention of chronic back pain. Studies have particularly focused on the transition from acute to chronic or persistent pain. Two strategies have emerged as being particularly useful. In one Scandinavian study a multidisciplinary approach incorporating measurements of functional capacity, a work-place visit, back education and an individualised graded exercise program compared with routine care allowed patients in the intervention group to return to work in 10 weeks compared with 15 weeks in the control group.⁵ In the year after the study, the intervention group had fewer days off sick from all causes than the control group. However, there was no statistically significant difference in pain intensity between the intervention and control groups, but subjective disability had decreased significantly more in the intervention group.

Perhaps the most impressive results in patients with subacute back pain have been those reported in another Scandinavian study.⁶ The study demonstrated that provision of advice and confident reassurance achieved a 50% reduction in work disability at five years' follow up.⁷ The advice provided a cogent explanation for the pain, and suggested simple bending and stretching exercises to perform when it occurred.

In a recent systematic review of risk factors for persistent low back pain, known as yellow flags, the authors concluded that the most helpful components for predicting persistent disabling low back pain were maladaptive pain-coping behaviours (such as fear-avoidance behaviour), nonorganic signs (such as pain on simulated spinal rotation, or nonanatomical motor or sensory loss), functional impairment, general health status and psychiatric comorbidities.⁸ Conversely, the presence of low levels of fear-avoidance behaviour and low levels

of baseline functional impairment were found to be associated with a resolution of symptoms.⁸

Against this background of information, a novel Australian study has tested the effects of a population-based intervention to change back pain beliefs and levels of disability.⁹ The study examined a media campaign based on *The Back Book*, which emphasises the generally good prognosis for patients with back pain and the need to move and perform usual activities rather than resting and avoiding physical activities.¹⁰ It was aimed at both GPs and the general public and demonstrated persistent effects on positive attitudes to back pain.

Nonpharmacological treatments

The management of patients with chronic back pain, as with all chronic problems, requires the doctor to establish a soundly based therapeutic relationship with the patient. Mindful of the above mentioned risk factors, reassurance and encouragement to keep moving despite pain are recommended. Explanation of the significance or not of imaging reports should be addressed. Patients should be encouraged to appreciate that 'hurt' does not mean 'harm'. When work issues are pertinent, it has been demonstrated that if the caring doctor appreciates the nature of the individual's work, and where appropriate contacts the patient's employer to explain the situation, then work disability can be reduced.

Specifically exploring the significance and effects of the patient's pain are important in identifying persisting yellow flags. Unrealistic fears and expectations or treatable mood disorders may be identified by asking simple questions such as:

- how does the pain interfere with your life?
- how does the pain affect your mood?
- what are you concerned might be causing the pain?

Formal cognitive behavioural therapy focuses on helping patients develop

adaptive-coping behaviours and strategies to self-manage their pain. It has been shown to be effective in patients with chronic low back pain, improving function and disability. Cognitive behavioural therapy should be considered early if adverse psychosocial issues are identified.

Physical treatments

The role of passive physical treatments should be to facilitate restoration of exercises and physical activity. Most physical treatments provide temporary pain relief but should not be the mainstay of therapy. Warm or cold packs may provide some temporary pain relief and allow continuation or resumption of physical activity. Complementary therapies such as massage and acupuncture have been shown to have a beneficial effect in the short term.

Manipulation and mobilisation

Despite their popularity, manipulation and mobilisation techniques have been shown to have a small to modest effect on chronic back pain. However, their effects are at least equivalent to other conservative treatments. There is an extremely low risk of adverse effects from spinal manipulation of the low back. There is no evidence that long-term treatment with programs of passive manual therapy favourably influence outcomes in patients with chronic back pain.

Exercise-based therapy

There is good evidence that a range of exercise interventions are effective for decreasing the frequency of recurrences of back pain. Typical programs include exercises to strengthen low back extensor muscles and abdominal musculature ('core strengthening'), and increase flexibility.¹¹

Recent systematic reviews have shown benefit from various exercise programs in patients with chronic low back pain, but have not revealed the best type or types of activity.¹²

A reasonable program would initially have two supervised exercise sessions per week until the patient is confident in the performance of the particular activities. This should then progress to a home-based unsupervised program, which should be continued indefinitely.

Other studies have demonstrated that aerobic exercise programs (including activities such as walking, swimming and cycling) benefit people with chronic low back pain, improving pain and function.¹³ Exercise also assists with weight control and improves general well-being and should be actively encouraged. Although formal evidence of efficacy is lacking, many patients find water-based

exercise programs such as aqua aerobics or swimming easier to comply with than land-based exercise programs.

Combining exercise therapy with manual therapy, with or without massage, results in short-term improvements in pain and may facilitate increased activity.

Pharmacological treatments

Analgesics

There is little evidence to guide the practitioner in the use of analgesics in patients with chronic back pain. Short-term use of analgesics and NSAIDs in patients with acute exacerbations of low back pain can facilitate the maintenance of activity. The principles followed should be to achieve adequate pain relief without causing adverse effects. Paracetamol may be used to reduce the overall daily doses of NSAIDs required, and therefore reduce the risk of adverse effects. Patients should be once again reassured that hurt does not equal harm, and it should be explained that a realistic expectation is that analgesics may relieve but not totally remove the pain.

In patients with persistent back pain, regular dosing is more appropriate than 'as-needed' dosing or the use of alternate analgesia for breakthrough pain. A reasonable starting point is to use regular paracetamol in either standard or modified-release form in divided doses up to a total of 4 g daily. The use of NSAIDs may be useful in some patients, but their benefit should be constantly weighed against their potential for adverse effects, especially with long-term use, including gastrointestinal toxicity, renal toxicity and adverse effects on hypertension control.

Patients who fail to respond to simple analgesia, particularly when other interventions have also been unsuccessful, represent an important therapeutic challenge for the GP. For patients with flares of pain not responding to nonpharmacological interventions or short-term paracetamol or NSAIDs (i.e. less than

three weeks), use of opiate-based analgesics such as codeine, tramadol or oxycodone at the lowest effective dose may be justified. The aim of such treatment is to restore function and activity during an exacerbation of pain, and this should be discussed clearly with the patient before initiation.

When patients have ongoing severe pain and are judged to require ongoing analgesia, careful review of the patient's situation, including psychological factors, beliefs and expectations, is important. Nonpharmacological interventions such as physical treatments and physical activity should be optimised. If patients are still in need of ongoing analgesics, despite regular use of an immediate-release opioid, they can be changed to an equivalent dose of a modified-release opioid for up to 12 weeks; there is no evidence supporting the use of opioids beyond this time.

Patients should be monitored and dose adjustments made according to their responses. It is important not to change the dose of modified-release drugs too quickly because they take several days to achieve steady-state levels. Patients with the need for prolonged courses or escalating doses of opiates may benefit from specialist assessment, ideally at a pain clinic.

Coanalgesics

The use of coanalgesics such as tricyclic antidepressants (TCAs) may be of use in patients with back pain (off-label use) if other medications provide insufficient relief from pain persisting beyond two to three weeks. The doses used are much smaller than for depression, and typically start at 10 to 25 mg orally at night, increasing every seven days and titrating against symptoms to a maximum dose of 75 to 100 mg orally at night. Patients should be warned that they may be drowsy and have a dry mouth while taking these coanalgesics. TCAs have the potential to cause many adverse effects and drug interactions and these should be actively

considered in the individual patient before use.

The use of other antidepressants, such as serotonin selective reuptake inhibitors (SSRIs), in patients with back pain alone is not supported by the available literature. However, it is important to treat any concurrent depression appropriately.

Some patients with persistent low back pain (more than six months' duration) develop neuropathic pain features. In this setting it may be worth considering a trial of pregabalin but there is no evidence to support its use beyond 12 weeks. Although use of pregabalin is approved for patients with neuropathic pain, it is not currently indicated in Australia to treat patients with chronic back pain.

Injections

There is evidence that intra-articular injections of corticosteroids into painful lumbar zygapophyseal joints are of no benefit to patients when compared with injections of local anaesthetic alone.

A Cochrane review into the effects of radiofrequency denervation for lumbar zygapophyseal joint pain concluded that there was conflicting evidence for its efficacy.¹⁴ However, there has been considerable debate about the techniques used for both diagnosis and treatment in the quoted trials, which may have lead to some poor results.

At present, radiofrequency denervation of the lumbar zygapophyseal joints is only available in a small number of centres. It is only appropriate for the small percentage of patients with back pain who demonstrate appropriate responses to local anaesthetic blocks of their zygapophyseal joints. These considerations severely limit the technique's general application.

Injections into other structures, such as epidural corticosteroid injections and sacroiliac joint injections, have no proven role in patients with uncomplicated low back pain. Local anaesthetic injections into tender areas, particularly at the muscle

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attachments to the pelvic brim, may provide temporary relief in some patients and facilitate early return to activity.

Multimodal therapy

Multidisciplinary interventions, either in the form of multidisciplinary pain clinics or rehabilitation programs, aim to combine interventions with an emphasis on restoration of function, physical retraining and cognitive behavioural therapy. A synopsis of systematic reviews concludes that behavioural treatment versus no treatment, placebo or waiting list controls reduces pain in the short term.¹⁵ No significant differences were found between different types of behavioural treatment and there is conflicting evidence for behavioural treatments versus other active treatments. One of the problems in interpreting this data is that it is rare that behavioural therapy is used in isolation. Interestingly, there is moderate evidence that adding a behavioural component to a 'usual treatment' program such as inpatient rehabilitation confers no additional benefit.

There is strong evidence that intensive, inpatient, multidisciplinary biopsychosocial rehabilitation improves levels of pain and function. However, the data on vocational outcomes such as return to work were conflicting and there is no benefit from less intensive, outpatient-based programs.

Surgery

There is no role for surgery in patients with uncomplicated back pain. The principal role of surgery of the spine is to decompress neural structures, such as nerve roots in patients with prolapsed discs and the cauda equina in patients with spinal canal stenosis.

Conclusion

Chronic back pain remains a challenging problem for GPs. Applying a graded approach to treatment, carefully exploring and managing patient's expectations

and emphasising safe and potentially effective interventions such as exercise remain the cornerstone of therapy. **MT**

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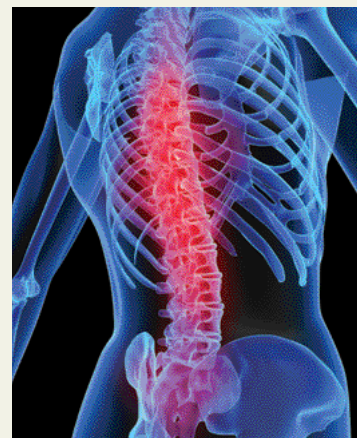
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