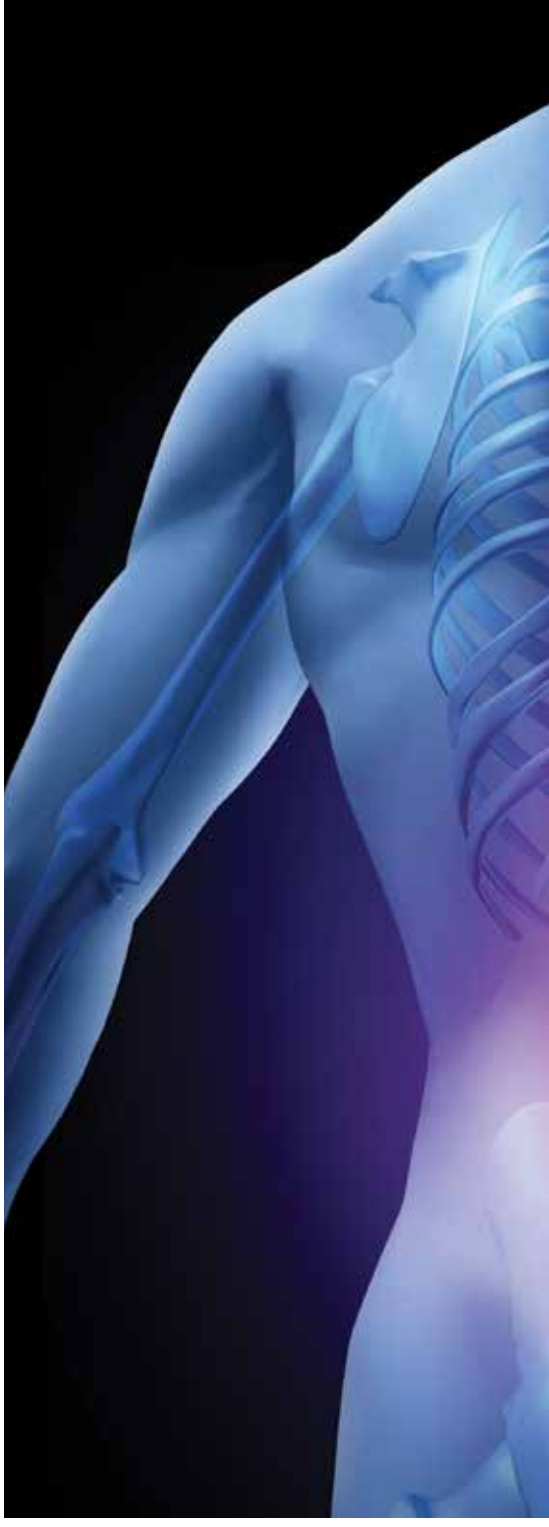
Management of nonspecific low back pain

A growing issue

MARY O'KEEFFE BSc(Physio), PhD
RACHELLE BUCHBINDER MB BS(Hons), MSc, PhD, FRACP, FAHMS

Low back pain (LBP) is the leading cause of disability burden worldwide. This article outlines how health professionals can reach a diagnosis of nonspecific LBP and reviews the recommended nonpharmacological and pharmacological treatments with reference to the UK, US and Denmark clinical practice guidelines, as well as the *Lancet* Low Back Pain series.



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Low back pain (LBP) is the leading cause of disability in Australia and worldwide, and is associated with a significant personal, social and economic burden.[1-3] Globally, disability burden due to LBP has increased by 54% since 1990, threatening the sustainability of healthcare and social systems.[3] LBP costs the Australian health system A$4.8 billion annually and it is the leading health complaint responsible for early retirement among middle-aged Australians.[4-6] The *Lancet* Low Back Pain Series published in March 2018 concluded that there is an urgent need for action to reduce the current and projected disease burden, highlighting evidence practice gaps across all disciplines (e.g. medicine, physiotherapy) and the global prevalence of ineffective and costly care.[3,7-9]

Since we are currently unable to identify the cause of the majority of LBP (if such a cause exists), we refer to most LBP as nonspecific LBP (NSLBP).[10] Management of NSLBP commonly focuses on providing information and advice about the problem, and strategies to minimise pain and maintain normal function. Most people do not require any imaging, so an explanation of this as well as a discussion of imaging's potential for harm should be a focus in the initial consultation, as should the evaluation and addressing of misconceptions about NSLBP and other factors associated with the risk of a poorer outcome. The increasing use of

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Dr O'Keeffe is a Postdoctoral Research Fellow at the Institute for Musculoskeletal Health, Sydney School of Public Health, Faculty of Medicine and Health, The University of Sydney, Sydney, NSW.
Professor Buchbinder is a Rheumatologist and Director of the Monash Department of Clinical Epidemiology, Cabrini Institute, and Professor of Clinical Epidemiology in the Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University, Melbourne, Vic.

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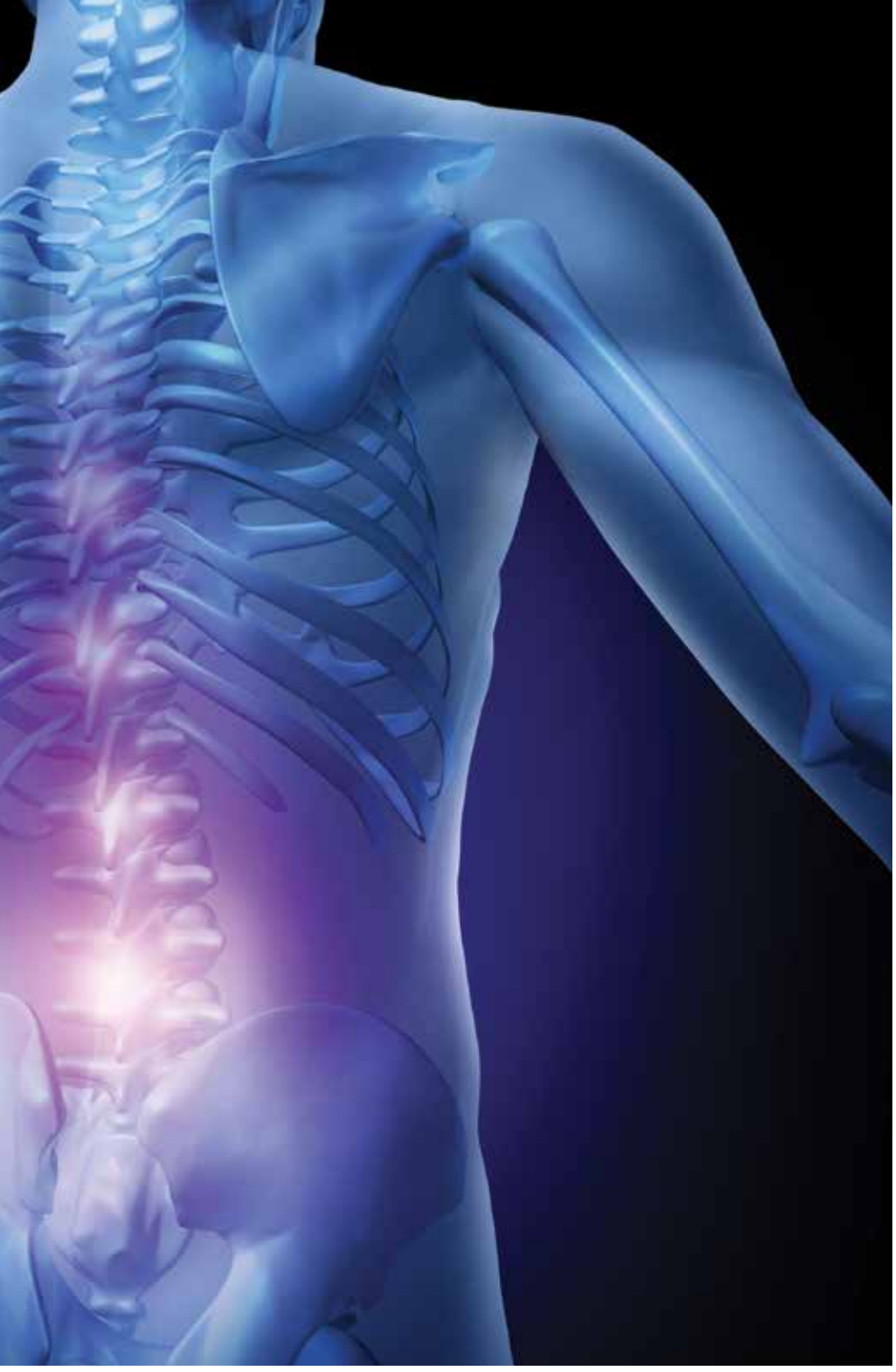

Key points

- Detailed history taking and a physical examination are recommended to triage patients with low back pain (LBP) into: those with LBP caused by nonspinal causes; those with serious spinal pathology; those with radicular syndromes; and those with nonspecific LBP (NSLBP).
- Diagnostic imaging and other investigations are only required for the small number of patients with suspected serious or specific pathology.
- Most patients with LBP including radicular syndromes do not require immediate diagnostic imaging and can be managed in primary care.
- All patients presenting with NSLBP should be asked about their beliefs and their expectations from the consultation, offered information on the non-life-threatening but recurrent nature of LBP and advice on self-management.
- For patients with acute NSLBP who do not respond to education and self-care advice, and are slow to recover, consider nonpharmacological treatments for pain relief such as heat and exercise.
- For patients with persistent NSLBP, consider nonpharmacological treatments for pain relief, such as exercise programs, psychological treatments, spinal manipulation, massage and interdisciplinary rehabilitation.
- Pharmacological treatment is best avoided as many commonly used therapies have been proven ineffective or harmful; however, NSAIDs may provide short-term limited benefits.

nonrecommended and sometimes harmful care (e.g. low-value physical therapies, opioids, spinal injections and surgery) represents a major global challenge to the safe and appropriate management of NSLBP. In a bid to divert people away from nonrecommended or harmful practices, clinical practice guidelines now place a greater emphasis on evidence-based non-pharmacological treatments.[11-13]

This article outlines how GPs and other health professionals can reach a diagnosis of NSLBP, and reviews the recommended nonpharmacological and pharmacological treatments for LBP with reference to three clinical practice guidelines from the UK, US and Denmark, as well as the *Lancet* Low Back Pain series.[8,11-13]

How do I know if my patient has nonspecific low back pain?

A diagnosis of NSLBP is reached after a triage process, in which the medical practitioner must perform a thorough clinical evaluation

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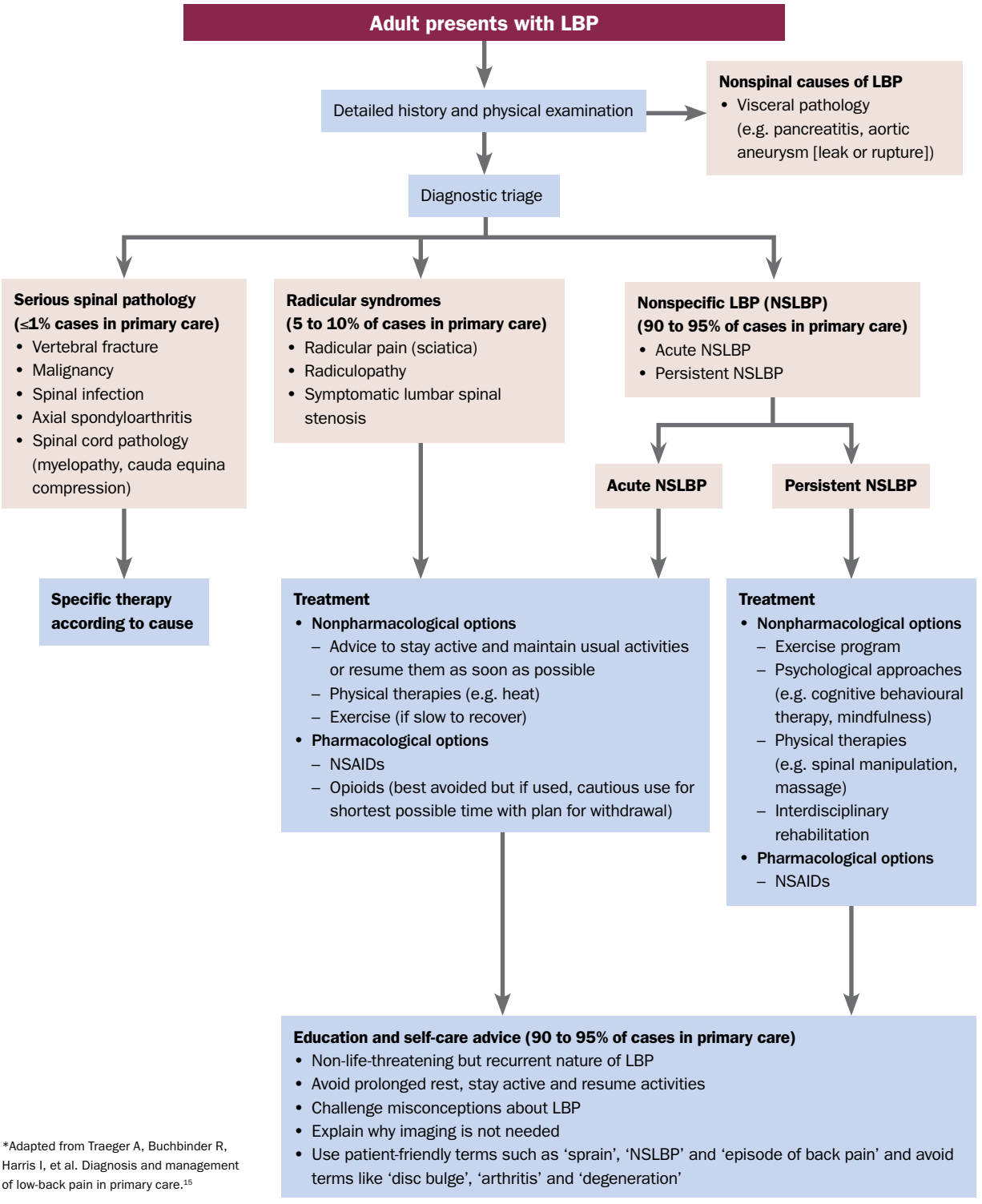
Diagnosis and management of low back pain (LBP) according to current clinical guidelines*



*Adapted from Traeger A, Buchbinder R, Harris I, et al. Diagnosis and management of low-back pain in primary care.[15]

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(history and physical examination) to rule out nonspinal causes of LBP (e.g. referred visceral pain, aortic aneurysm) and serious specific causes of LBP, as well as consider radicular syndromes (Flowchart).[14,15] Although serious pathology is rare in patients presenting with LBP in primary care (e.g. only 1% of an Australian cohort of 1172 patients had a serious cause of LBP[16]), clinical suspicion of serious pathology should be raised by the presence of alerting features (Table 1).[14]

Radicular syndromes can be divided into three subsets with unique alerting features: radicular pain (caused by nerve root irritation), radiculopathy (caused by nerve root compromise) and symptomatic lumbar spinal stenosis (Table 2).[14,17]

Radicular syndromes show similar outcomes after nonpharmacological approaches (e.g. education and exercise) and surgery.[18-20] Therefore, clinicians should first manage radicular syndromes such as NSLBP (see Management of NSLBP below). Prompt referral to a spinal surgeon is always indicated for patients who have severe or progressive neurological deficits. For patients with disabling symptoms of longer than six weeks' duration with a lack of response to nonoperative management, specialist referral (rheumatologist, rehabilitation physician, spinal surgeon) can also be considered.[21,22] Laminectomy for radiculopathy may shorten the duration of symptoms, but outcomes at 12 months are similar to nonoperative treatment and surgery is associated with an increased risk of further surgery.[21] Decompression surgery for symptomatic central lumbar canal stenosis may improve symptoms, but currently there is a lack of high-quality evidence for its superiority over nonoperative management.[21,22]

After excluding the categories of specific spinal pathology and radicular syndromes, a diagnosis of NSLBP can be made for most patients (90 to 95%). This simply indicates that it is not currently possible to identify a specific pathoanatomical cause of LBP. A number of lumbar structures are potential causes of LBP (e.g. the intervertebral disc, facet joint, sacroiliac joint) but clinical tests cannot reliably attribute LBP to these structures.[23] Hence, in the normal clinical setting these diagnoses represent nominal diagnoses, and their use may drive the provision of invasive and unproven interventions that target those lumbar structures (e.g denervation procedures and targeted injections for NSLBP).[23,24]

Table 1. Serious pathologies presenting in patients with low back pain*

Serious pathologies	Alerting features
Vertebral fracture	• Older age • Prolonged glucocorticoid use • History of significant trauma • Presence of contusion or abrasion
Malignancy	• History of malignancy† • Unexplained weight loss • >50 years of age
Spinal infection (e.g. osteomyelitis, epidural abscess)	• Symptoms and signs of infection (e.g. fever and/or chills) • Susceptibility to infection (e.g. immunosuppression, penetrating wound, IV drug user, underlying disease) • Recent injury, dental or spine procedure • Raised inflammatory markers (e.g. CRP, ESR)†
Cauda equina compression	• Altered bladder and/or bowel function (e.g. urinary retention, faecal incontinence) • Reduced sensation or numbness in the 'saddle' area • Persistent or progressive bilateral foot or leg weakness
Axial spondyloarthritis	• Symptom duration of longer than three months • Younger onset (before 45 years of age) • Improvement of symptoms with physical activity or exercise and no improvement with rest • Prolonged morning stiffness and night pain • Peripheral symptoms (e.g. alternating buttock pain, arthritis, enthesitis, dactylitis) • Extra-articular symptoms (e.g. psoriasis, inflammatory bowel disease, uveitis) • Positive response to NSAIDs
Spinal cord pathology (myelopathy)	• Sensory loss • Weakness • Hyperreflexia or hyporeflexia • Upgoing plantar responses
Visceral pathology (e.g. pancreatitis, aortic aneurysm [leak or rupture])	• Sudden, unexplained onset of pain • Absence of aggravating features (e.g. pain not aggravated by spinal movements or postures) • Associated collapse or hypotension • Abdominal pain radiating to the back

Abbreviations: CRP = C-reactive protein; ESR = erythrocyte sedimentation rate; IV = intravenous

* Adapted from Bardin LD, King P, Maher CG. Diagnostic triage for low back pain: a practical approach for primary care.[14]

† A history of malignancy is the only proven single alerting feature for suspected malignancy.

† ESR and CRP should only be measured if other alerting features for spinal infection are present.

When should I request tests?

Imaging tests such as plain radiograph, CT and MRI scans have no role in the management of NSLBP when there is no clinical suspicion of a serious pathology.[9] This recommendation is consistent across guidelines as well as Choosing Wisely lists

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Table 2. Radicular syndromes presenting in patients with low back pain (LBP)*

Radicular syndromes	Alerting features
Radicular pain (commonly called sciatica)	• Leg pain made worse by coughing, sneezing or straining • Primary leg pain (leg pain often worse than LBP) • Unilateral, dermatomal concentration (below knee for L4, L5, S1) pain location
Radiculopathy	• Neurological symptoms or signs (e.g. weakness, loss of sensation, reduction or loss of reflexes associated with a particular nerve root). Note: Radiculopathy and radicular pain often coexist[17]
Symptomatic lumbar spinal stenosis	• Neurogenic claudication or pseudo-claudication • Older patient, LBP often radiating to the buttocks and legs, and is usually bilateral • Aggravated by walking or standing, and relieved by flexion (e.g. leaning forward, sitting)

*Adapted from Bardin LD, King P, Maher CG. Diagnostic triage for low back pain: a practical approach for primary care.[14]

including the Australian Rheumatology Association's 'top five' EVOLVE list of investigations and interventions doctors and patients should question.[25] Diagnostic tests only have a role when the clinician suspects specific pathology that requires different management to NSLBP (Table 1).[14]

Medical practitioners should be careful about giving structural labels to low back pain

Many radiological findings (e.g. disc bulges, disc degeneration, annular tears) identified in people with NSLBP are also common in people without pain.[26] Many findings are deemed age-related changes and do not constitute diagnoses.[27] Moreover, examining structures through imaging has not been found to determine prognosis of LBP or future LBP, or improve LBP clinical outcomes.[28-30] An online randomised controlled trial (O'Keeffe et al, unpublished data) found that the labels 'disc bulge', 'degeneration' and 'arthritis' increased intentions for imaging and surgery while reducing recovery expectations, compared with the labels 'lumbar sprain', 'an episode of back pain' and 'NSLBP' in people with and without LBP. Therefore, medical practitioners should be careful about giving structural labels to LBP and may need to adopt patient-friendly terminology such as 'sprain', 'NSLBP' and 'episode of back pain'.

Management of nonspecific low back pain

Patients presenting with a new episode of NSLBP tend to improve markedly in the first six weeks.[31] Therefore, most patients only need reassurance and strategies to self-manage their symptoms. Providing more care than this is often unnecessary and extra support should be reserved for people with more severe symptoms or features suggesting a risk of chronicity (e.g. fear-avoidance beliefs, depression, negative recovery expectations and poor pain-coping behaviours).[32-35] A number of prognostic screening tools have been developed to help the health practitioner in choosing the type and intensity of treatment required. These include the STarT Back Screening Tool, Orebro Musculoskeletal Pain Questionnaire and PICKUP model for patients with acute LBP.[36-38] However, a systematic review found that such screening tools only yield modest accuracy, indicating that relying solely on these tools to guide management may result in overtreatment of patients with a good prognosis and undertreatment of patients with a poor prognosis.[14,39]

Nonpharmacological options

Education and self-care advice

First-line for acute and persistent NSLBP

Reassurance, education and self-care advice form the mainstay of treatment for NSLBP and is recommended by all clinical guidelines. Similar self-care advice is recommended for acute and persistent pain presentations. Although there is a limited evidence base to guide how this is best performed, identifying and managing patients' beliefs and expectations together with effective communication skills are a key part of this process.[40,41]

Reassurance should focus on the non-life-threatening nature of LBP. Clinicians are advised to inform people to avoid prolonged bed rest, remain active and continue or return to usual activities including work, despite pain, as soon as possible. NSLBP is now considered a long-lasting condition for many, with a variable course rather than episodes of unrelated occurrences.[3] It was a common view that patients with episodes of acute NSLBP recovered completely within four to six weeks. However, although many episodes of NSLBP improve substantially within six weeks and 33% of patients recover in the first three months, 65% still report some pain at 12 months.[31,42] It is important that patients appreciate the variable clinical course of NSLBP. Further, up to 40% of people will have a recurrence within a year of recovering from a previous episode.[43,44] Therefore, it is now recommended that doctors inform patients that NSLBP often recurs.[15]

Delivering reassurance is challenging. Many patients expect imaging for their LBP and want a diagnosis.[45,46] Where possible, GPs should take time to listen to patients' concerns and explain why they do not need imaging. To optimise reassurance, some research suggests performing a timely review of patients to allow doctors to assess progress towards recovery, or a method of watchful waiting to delay diagnostic imaging.[15]

There are widespread misconceptions

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about the causes and prognosis of NSLBP.[9,47] Although not explicitly mentioned in the guidelines, clinicians should examine and address any potentially relevant misconceptions about back pain. These include misconceptions about the need for imaging to treat NSLBP, structural displacements (e.g. slipped discs), the spine being particularly vulnerable to loading and slow to heal; being healthy means never experiencing pain, pain being an accurate indicator of tissue damage, and there being a cure for persistent NSLBP.[47]

To shift focus from cures for LBP, the *Lancet* LBP series proposed the idea of living well with LBP through a concept called positive health – 'the ability to adapt and to self-manage, in the face of social, physical, and emotional challenges'.[9,48] However, there is a lack of guidance on how to deliver this message in a way that is acceptable to people with LBP without appearing to dismiss their experience. Attempts to communicate this message may benefit from research with a strong patient and public involvement component.[49]

Overall, there is some evidence that patient education can provide long-term reassurance, reduce pain-related distress and reduce healthcare use in patients with acute or subacute NSLBP.[50] It is worth noting that reassuring educational interventions as short as five minutes can benefit people for up to 12 months.[50]

Exercise therapy

First-line for persistent NSLBP, limited use in selected acute NSLBP patients

Exercise is recommended in all clinical guidelines for NSLBP.

Specific exercise is ineffective for acute LBP.[51] First-line treatment includes encouraging people to remain active, emphasising that activity is not dangerous for the spine and that NSLBP should not deter people from re-engaging in functional activities. Prescription of specific exercise or structured exercise programs can be considered if recovery is slow, or for patients with risk factors for persistent NSLBP.[52]

Structured exercise is recommended for patients with persistent NSLBP.[47] There are many different biomechanical, aerobic, mind-body or combinations of these approaches available.

Since there is clear evidence that the various forms of exercise (e.g. yoga, Pilates, walking) deliver similar effects if implemented well, clinical guidelines recommend exercise programs that take patient needs, preferences and capabilities into account when deciding the type of exercise to provide.[11,51] However, there is evidence that longer periods of exercise (more than 20 hours of intervention time in total) and supervised programs tailored to the patient yield larger benefits than other delivery modes.[53]

Cognitive behavioural therapy for persistent nonspecific low back pain may be effective in the short-term

Psychological therapies

First-line care for persistent NSLBP

Psychological therapies such as cognitive behavioural therapy (CBT) and mindfulness are not recommended in the guidelines for acute NSLBP.[8] However, these therapies are endorsed for persistent NSLBP in patients who have not responded to previous treatments. There is evidence from a *Cochrane* review of behavioural treatment (30 trials, 3438 participants) that CBT for persistent NSLBP may be effective in the short-term.[54]

Spinal manipulation and massage

Second-line care for acute and persistent NSLBP

Both US and Danish guidelines recommend the use of spinal manipulation and massage as second-line options for LBP, while the UK guideline states that spinal manipulation and massage should be considered only if delivered alongside an exercise program.[11-13] Neither spinal manipulation nor massage are strongly supported by the evidence. The most recent *Cochrane* review of spinal manipulation (47 trials, 9211 participants) concluded it was no better than sham manipulation for reducing pain or improving function, while in a *Cochrane* review of massage (25 trials, 3096 participants), the authors stated they had very little confidence that massage was effective for LBP.[55,56]

Heat

Second-line care for acute NSLBP

The US guideline endorses heat therapy based on a *Cochrane* review of superficial heat or cold (nine trials, 1117 participants) that found a moderate effect of heat on short-term pain outcomes compared with oral placebo or non-heated wrap.[12,57] There is insufficient evidence for the role of heat in persistent NSLBP.

The UK and Danish guidelines do not refer to heat therapy.[11,13]

Acupuncture

Second-line care for acute and persistent NSLBP

Guidelines provide conflicting advice about acupuncture. The US guideline recommends acupuncture as second-line care based on an overview of six systematic reviews showing low-quality evidence of a small, short-term benefit in pain compared with sham acupuncture.[12,58]

In contrast, the UK and Danish guidelines recommend that health practitioners should not offer acupuncture based on the small size of the effect, no benefit over sham, and the wider literature showing that acupuncture lacks biological plausibility and a compelling treatment-specific effect.[11,13,59,60]

Overall, when acupuncture has been tested in high-quality trials versus a credible sham control, it fails to show an effect.

Interdisciplinary rehabilitation

Second-line care for persistent NSLBP

Interdisciplinary rehabilitation has evidence from a *Cochrane* review (41 trials, 6858 participants) showing that the treatment can lead to modest improvements in pain, disability and work status, and is endorsed as a second-line or adjunctive option for persistent NSLBP.[61]

Pharmacological options

Paracetamol

Do not provide for acute or persistent NSLBP

Paracetamol was once the recommended first-line pharmacological option for LBP.

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However, guidelines now recommend against its use following a high-quality trial showing it provided no benefits over placebo in patients with acute NSLBP.[62]

NSAIDs

Second-line care for acute and persistent NSLBP

NSAIDs are the only pharmacological option endorsed as a second-line care option across guidelines. However, although there is strong evidence that NSAIDs provide definite but limited benefit with respect to pain, clinicians need to weigh up the benefit-to-harm ratio when prescribing and aim for the lowest effective dose for the shortest possible time.[63,64]

Muscle relaxants

Limited use in selected acute NSLBP patients

There is no evidence to support the use of benzodiazepines in LBP. Guidelines suggest considering the use of muscle relaxants for short-term use in select patients with acute NSLBP, although further research in this area is required.[65] Similar to the NSAIDs, clinicians need to weigh up the benefit-to-harm ratio (e.g. risk of falls in older adults) of prescribing muscle relaxants. There is insufficient evidence to support their use in persistent NSLBP.[65]

Neuromodulators

Do not provide for acute or persistent LBP

Neuromodulators such as gabapentin and pregabalin have no role in the treatment of NSLBP, and are associated with serious harms.[66,67]

Antidepressants

Do not provide for acute or persistent LBP

There is insufficient evidence to support the use of antidepressants (e.g. selective norepinephrine reuptake inhibitors and tricyclics) in acute or persistent NSLBP.[68,69]

Opioids

Limited use in selected patients, use with caution

Routine use of opioids is not recommended since benefits are small and harms can be substantial.[70] Besides their well-known potential for dependence, addiction and overdose, in chronic users they also confer an increased risk of bacterial infection and more rapid progression of viral infection (in line with their immunosuppressant properties), and increased risk of endocrinopathy.[71] Guidelines caution that (weak) opioids should be used only in carefully selected patients, for a short duration only, with close monitoring and a plan to stop.

Surgery has no role in the management of nonspecific low back pain

Interventional therapies

Do not provide for acute or persistent NSLBP

The role of interventional therapies is limited and recommendations in clinical guidelines vary. For example, although medial branch blocks and radiofrequency denervation are used for persistent pain, there is insufficient evidence to support their use.[72]

Clinical guidelines do not recommend facet joint or epidural injections for NSLBP. Although epidural injections may be associated with modest short-term (less than four weeks) reductions in pain in people with severe radicular pain, neither type of injection is effective for NSLBP.

Although referral for surgical opinion is often considered for those who do not respond to conservative care, surgery (e.g. lumbar fusion, disc replacement) has no role in the management of NSLBP.[10,73]

Can future episodes of nonspecific low back pain be prevented?

People with NSLBP would like information about preventive strategies.[46]

There is some evidence that exercise can prevent future episodes of LBP (secondary prevention).[74] However, the proven effective exercise programs are intensive (e.g. 20 one-hour sessions of supervised exercise in one trial), and have only been trialled in specific subgroups of the population such as the military and may not be generalisable, cost-effective or scalable. Ongoing research is examining people's interest in engaging in different types and doses of exercise for secondary prevention of LBP.

Other popular interventions promoted to prevent LBP (e.g. work-place education, no-lift policies, ergonomic furniture, mattresses, back belts, lifting devices, shoe insoles) are unlikely to be effective according to the current evidence base.[74]

Although there is evidence to suggest obesity, smoking and lack of physical activity are all likely to be contributors to developing LBP, there are no studies that have investigated whether addressing these issues prevent future episodes of LBP.[3]

Conclusion

LBP costs the Australian health system A$4.8 billion annually and is the leading health complaint responsible for early retirement among middle-aged Australians. A diagnosis of NSLBP is reached after a triage process, including a thorough clinical evaluation to rule out nonspinal and serious specific causes of LBP, as well as radicular syndromes. Imaging tests such as plain radiograph, CT and MRI scans, have no role in the management of NSLBP when there is no clinical suspicion of a serious pathology.

Reassurance, education and self-care advice form the mainstay of treatment and are recommended by all clinical guidelines. Reassurance should focus on the non-life-threatening nature of LBP. Clinicians are advised to inform people to avoid prolonged bed rest, remain active and continue or return to usual activities including work, despite pain, as soon as possible. Health professionals should also be careful about giving structural labels such as 'disc bulge', 'degeneration' and 'arthritis' to LBP and may need to adopt patient-friendly terminology such as 'sprain', 'NSLBP' and 'episode of back pain'. Pharmacological treatment is best avoided as many commonly used therapies have been proven ineffective or harmful; however, NSAIDs may provide short-term limited benefits. **PMT**

COMPETING INTERESTS: None.

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