

Acute low back pain

Low back pain is the leading contributor to disability in New Zealand; it is only rarely a life-threatening condition, but it represents a significant health burden both to patients and the healthcare system. Primary care clinicians have a key role in implementing early interventions to reduce the likelihood of patients progressing to chronic low back pain and associated disability.

KEY PRACTICE POINTS:

- Low back pain affects up to 80% of people at some stage during their lifetime; approximately half of these people seek medical advice or treatment
- Most people with acute low back pain have restoration of function within a few weeks to months, however, many people have ongoing pain one year after an acute episode; the aim of management is to effectively treat acute low back pain to reduce the risk of chronic disability
- Serious causes of low back pain are rare and can usually be excluded with a detailed history and targeted physical examination
- Laboratory investigations or imaging are generally not required in patients with acute low back pain in the absence of red flags; an exact diagnosis is often not possible, nor needed, for management
- Patient beliefs and attitudes warrant as much attention as the anatomical and pathological aspects of their condition. Fear about pain is a major determinant of disability and possible chronicity; educate patients about the favourable prognosis of acute low back pain and provide them with a plan to self-manage any relapses.
- Management should be focused on coping strategies, non-pharmacological interventions, e.g. stretching, relaxation techniques, superficial hot-cold applications, and education and advice on keeping active and returning to normal daily activities
- There is limited evidence for pharmacological treatments for non-specific acute low back pain, but analgesia may be required short term; long-term use should be avoided
- Ideally schedule a follow-up appointment to monitor treatment progress, check adherence to the treatment regimen and reinforce recommendations



In this article we feature expert commentary from Musculoskeletal Medicine Specialist and General Practitioner, **Dr Jeremy Steinberg**.

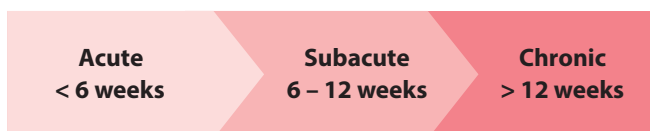
This is a revision of a previously published article.
What's new for this update:

- A full article revision and update of evidence
- Key changes in the management of acute non-specific low back pain include:
 - Prioritise non-pharmacological management strategies
 - Pharmacological treatments should be reserved for severe pain and if required, should be taken alongside non-pharmacological interventions at the lowest potency, the lowest effective dose and for the shortest possible duration
 - NSAIDs show greater efficacy compared to paracetamol when taken alone for the management of acute non-specific low back pain
- A new section has been added on managing persistent low back pain

Low back pain is a leading cause of disability

Low back pain involves discomfort, muscle tension or stiffness, arising from components of the lumbosacral spine. Pain may radiate to the groin, buttocks or legs as somatic referred pain or may be radicular pain, i.e. sciatica, indicating potential nerve root involvement.¹

Low back pain is defined by the length of time that it has been present:²



Prompt and appropriate management of people with acute low back pain is essential to reduce the risk of progression to chronic pain and associated disability, however, only half of all people with low back pain seek advice or treatment.²

The exact cause and origin of acute low back pain is largely unknown

Unlike with chronic low back pain, for most people with acute low back pain it is usually not possible to identify the specific cause, i.e. to make a patho-anatomic diagnosis.¹ Low back pain can result from numerous known and unknown structural and functional abnormalities or disease processes; severity of pain and associated disability is also influenced by multiple factors, including pain processing mechanisms, biopsychosocial factors and patient co-morbidities.¹

There are three main classifications of acute low back pain:^{3,4}

- 1. Non-specific acute low back pain** (90 – 95% of cases in primary care)
 - Lumbar musculoskeletal origin – a diagnosis of exclusion
- 2. Radicular syndrome** (5 – 10% of cases in primary care)
 - Radicular pain, radiculopathy
- 3. Serious pathology*** (< 1% of cases in primary care)
 - Vertebral or sacral fracture, primary tumours and metastases, spinal infection, axial spondyloarthritis, cauda equina syndrome

* N.B. Serious non-spinal pathology can also present as back pain, e.g. abdominal aortic aneurysm (Table 1), pyelonephritis, pancreatitis or prostatitis.

Begin with a focused history and physical examination

Once established that the patient has acute low back pain, begin by taking a focused history and then perform a physical examination guided by relevant clues.⁴ Consider any red flags in the history or examination that could indicate a serious cause that requires further investigation or referral (Table 1).³

Key questions for assessing a patient with acute low back pain

As part of the patient history, ask about:



Site of pain. Ask the patient to describe and identify the site where their pain most often occurs, is the worst and where it is the most consistent; get them to point to areas of concern to avoid any confusion from their verbal descriptions, e.g. a patient may say “hip pain” when referring to unilateral pain over the medial iliac crest. Buttock (gluteal) pain may indicate disorders of the hip and pelvis. Loin pain (pain lateral to the erector spinae and above the buttocks) may indicate pyelonephritis or other visceral disorders.



Pain radiation patterns. Pain may radiate to the groin, buttocks or legs as somatic referred pain or may be radicular pain; they can also co-exist.¹ Somatic referred pain is pain radiating from a somatic structure such as a facet joint, sacroiliac joint, muscle or intervertebral disc without nerve root involvement. Somatic referred pain is usually dull in nature, “like a toothache”, deep and diffuse with difficult to define boundaries. Radicular pain – the pain associated with nerve root involvement – is often described as shooting or stabbing, like an “electric shock”.³ Radicular pain generally travels in a narrow band below the knee, sometimes skipping regions, and may be associated with numbness or the sensation

of “pins and needles”.³ For further information, see “Referred pain syndromes”.



Mode of onset. This may not always help diagnostically but is important for ACC documentation, if applicable. Patients may recall a specific event that triggered the episode of acute low back pain, e.g. a fall, motor vehicle accident, a history of significant trauma potentially indicating vertebral fracture, however, pain may also occur for no apparent reason or after ordinary activity. A history of more minor trauma could also indicate vertebral or sacral fracture in some people, e.g. insufficiency fractures in people with osteoporosis or frailty. For patients with low back pain of insidious onset, consider inflammatory conditions, e.g. axial spondyloarthritis.³ Sudden onset of severe pain is a red flag.



Aggravating and relieving factors. Ask the patient what makes the pain better and worse. Typically, non-specific low back pain improves with rest and worsens with activity; the opposite occurs with inflammatory arthritides such as axial spondyloarthritis.¹ For people with acute low back pain that is not aggravated by certain movements nor relieved by rest, consider visceral and vascular disorders and malignancy. Leg pain that resolves with lumbar flexion and rest and worsens with extension may be neurogenic claudication from lumbar spinal stenosis.³



Severity and functional impact. Ask the patient how the pain is impacting on their daily routine and activities, including sleep. Pain at night, particularly if sleep is disturbed is a red flag.⁵ The severity of pain does not always correlate with the severity of the underlying cause. A verbal descriptor, e.g. none, mild, moderate, severe or excruciating, or a numerical scale, e.g. zero (none) to ten (worst pain imaginable), may be used to assess the severity of the pain and to record a baseline to measure treatment progress. A visual tool such as the **Faces Pain Scale** may be more appropriate for children, people with cognitive or language difficulties.



Associated features, i.e. Red Flags. Serious pathologies are rare causes of acute low back pain, and can be commonly missed during the initial investigation.⁶ Red flags are detailed in Table 1; the four most common serious pathologies are fracture, malignancy, spinal infection and cauda equina compression. Ask about or assess for:

- Trauma or risk factors for vertebral or sacral fracture

- Risk factors or symptoms that could indicate infection or malignancy such as unexplained weight loss, fatigue, night sweats or fever³
- Symptoms that raise concern for cauda equina syndrome, e.g. urinary dysfunction, including urinary hesitancy, retention and incontinence, altered perineal sensation or bilateral leg symptoms⁷
- Risk factors for cardiovascular disease that raise concern for abdominal aortic aneurysm, e.g. older age, male sex, current smoker, hypertension
- Skin lesions that may be a source for spinal infection or that may be associated with inflammatory conditions such as axial spondyloarthritis
- Pregnancy



Psychosocial factors. The psychological profile of a patient, including their level of resilience and coping mechanisms, has a direct impact on their experience of pain and likelihood of acute pain becoming chronic (for further information, see: “Identify and manage psychosocial risk factors, i.e. ‘yellow flags’”). Early identification of contributing psychosocial features is relevant to both the diagnosis and management of acute back pain. In particular, ask about or assess for:

- Fear-avoidance behaviour, e.g. avoiding movement or activity for fear of making the pain worse, fearful of the prognosis
- A tendency towards catastrophising, i.e. an exaggerated negative orientation towards pain
- Depression, anxiety or other mental health issue
- Social support, e.g. living situation, level of personal support (either over-protective or conversely, a non-supportive partner or family/whānau)
- Occupational considerations

Base the examination on patient history

The clinical examination of a patient with acute low back pain assists with determining the differential diagnosis. Clues from the patient history can be reinforced by positive examination findings to detect serious underlying conditions (Table 1), nerve root involvement (Table 2) or referred pain, e.g. pancreatitis, prostatitis, pyelonephritis, pregnancy-related pain.³ Examination can also help to quantify the severity of the patients symptoms.

Table 1. Red flags that may indicate a serious underlying cause of low back pain.^{3,4,10-14}

Potential diagnosis (prevalence in primary care)	Red flags	Investigations*
Vertebral or sacral fracture (0.7 – 4.5%)	<ul style="list-style-type: none"> ■ Older age (> 65 years male, > 75 years female) ■ Midline tenderness in a patient with a history of significant trauma ■ History of osteoporosis ■ History of cancer ■ Sporting activity involving spinal extension, rotation or both (Pars interarticularis stress fracture) ■ Prolonged systemic corticosteroid use ■ Significant trauma 	X-ray or referral for consideration of CT scan. MRI is often preferred for suspected stress fractures (ideally to detect stress reaction before a stress fracture occurs).
Axial spondyloarthritis† (0.1 – 1.4%)	<p>Chronic low back pain (> 12 weeks) with onset before aged 45 years and one or more of the following:</p> <ul style="list-style-type: none"> ■ Inflammatory back pain with at least four of: insidious onset, onset aged ≤ 40 years, improvement with activity, no improvement with rest, pain at night (with improvement when getting up) ■ Peripheral manifestations, e.g. arthritis, enthesitis, dactylitis ■ Extra-articular manifestations, e.g. psoriasis, inflammatory bowel disease, uveitis ■ Family history of spondyloarthritis ■ Response to NSAIDs 	Laboratory tests, e.g. CRP, HLA-B27. Referral for consideration of MRI to assess for sacroiliitis.
Spinal malignancy (0.2%)	<ul style="list-style-type: none"> ■ Personal history of malignancy ■ Age > 50 years ■ Unexplained weight loss ■ Pain not relieved by rest ■ Strong clinical suspicion 	Laboratory tests, e.g. FBC, CRP and PSA if male. Imaging – MRI is often preferred because plain X-rays are not as specific or sensitive for detecting spinal malignancy.
Cauda equina syndrome (0.04%)	<ul style="list-style-type: none"> ■ Bilateral leg symptoms, including bilateral lumbar radicular pain, lower limb weakness, sensory changes or progressive neurological deficits ■ Urinary dysfunction‡, including impaired bladder or urethral sensation, hesitancy, urgency or poor stream ■ Altered perineal sensation (subjective or objective) and reduced anal tone on per rectum examination‡ 	Cauda equina syndrome is an emergency, refer immediately for acute orthopaedic or neurosurgical assessment
Spinal infection (0.01%)	<ul style="list-style-type: none"> ■ Fever (> 37.8°C), night sweats or chills ■ Pain at rest or at night ■ Immunosuppression ■ Diabetes ■ Alcohol use disorder ■ Intravenous drug use ■ Recent injury, dental or spinal procedure 	Laboratory tests, e.g. FBC, CRP (or ESR**), and imaging – MRI preferred
Aneurysm, e.g. abdominal aortic aneurysm (1 – 2%)	<ul style="list-style-type: none"> ■ Palpable abdominal pulsatile mass ■ High cardiovascular disease risk ■ Anticoagulant use ■ Absence of musculoskeletal signs 	Laboratory tests, e.g. FBC, renal function, lipids, HbA _{1c} to assess cardiovascular risk. Referral for ultrasound. Urgent vascular surgery assessment if pulsatile mass is tender or patient with known AAA has new onset pain.

* If there is not convincing evidence of a serious aetiology from the patient history and examination, but still suspicion, consider a “watchful waiting” approach and review the patient within one to two weeks³

† See: <https://bpac.org.nz/BPJ/2016/July/spondyloarthritis.aspx> and <https://bpac.org.nz/update-series/systems.aspx> for further information

‡ Urinary retention or overflow incontinence, faecal incontinence and perineal anaesthesia are considered “white flags” – meaning defeat or surrender – and indicate that the diagnosis of cauda equina syndrome has been made too late.⁷ Impaired anal tone is occasionally considered a white flag; normal tone should not be a factor in deciding whether to refer in the correct clinical context.⁷ By the time white flags become apparent, the patient may not fully recover despite treatment.⁷

** ESR can be considered if CRP is not elevated but clinical suspicion for spinal infection remains. CRP and ESR both have high sensitivity for spinal infections, however, ESR testing may not be funded for this indication at all laboratories.¹⁵

Guided by the patient history and the nature and site of the pain, the physical examination may include:^{8,9}

- ✔ Observation of the posture, gait and general demeanour of the patient when they enter the consultation room
- ✔ Assessment of spinal range of motion, as tolerated
- ✔ Palpation of the spine to try to localise the pain and identify a vertebral level; while this is often not diagnostically useful for acute pain it helps to reassure the patient that their pain is being taken seriously, and any lack of tenderness raises suspicion of a non-musculoskeletal disorder
- ✔ Assessment for swelling, deformity, muscle tone and heat. If infection is suspected, check body temperature.
- ✔ Palpation of the abdomen for abdominal mass or abdominal aortic aneurysm, if suspected
- ✔ Neurological examination; although this is usually only necessary if the patient has weakness, numbness or radicular pain. For patients with pure low back pain, a quick neurological assessment (optional) is to observe them walking on their heels and toes and to test sensation with light touch over the feet.

👁 For a reminder on how to examine the lumbar spine, see: <https://stanfordmedicine25.stanford.edu/the25/BackExam.html>

Referred Pain Syndromes

During the clinical history and examination (including neurological assessment), consider symptoms and signs of nerve root involvement as a potential indicator of radicular pain or radiculopathy (Table 2).^{3,4} Radiculopathy occurs as a result of neural compression from any cause, whereas radicular pain involves the addition of inflammation e.g. from an inflamed herniated nucleus pulposus.¹ It is important not to confuse radicular pain with somatic referred pain, which is caused by pain radiating from a somatic structure such as a facet joint, sacroiliac joint, muscle or intervertebral disc without nerve root involvement. However, they can co-exist, e.g. a herniated disc can cause somatic referred pain from irritation of the dura of the nerve root plus radicular pain from irritation of the nerve root itself.

Consider whether investigations are indicated

Diagnostic laboratory investigations, e.g. FBC, CRP, or imaging, e.g. lumbar X-ray, MRI, are not routinely recommended for patients with acute low back pain unless there is suspicion of a serious underlying cause (Table 1), or if the results are likely to change management.^{4,18}

The benefit of investigation needs to be weighed up against the potential for harm, e.g. exposure to radiation, detection of unrelated abnormalities, health anxiety and

unnecessary follow-up.⁴ Changes unrelated to back pain such as disc bulges on MRI or degenerative changes on plain X-ray films are common incidental findings from imaging, with increasing prevalence with age.^{1,4}

In the correct clinical context, imaging and laboratory testing may be appropriate if there is no improvement in pain after four to six weeks (see: “Persistent low back pain”).^{9,18}



Dr Steinberg says: “There are competing interests with ordering investigations. On the one hand serious pathologies are very commonly missed at the initial assessment, e.g. approximately 50% of patients with spinal infection are initially misdiagnosed.^a New Zealand research has found evidence that access criteria for MRI may be too strict in the public system with very high pick-up rates of serious conditions (1 in every 6.5 patients scanned),^b suggesting that not enough MRIs are being done. On the other hand, serious conditions are rare overall and ordering unnecessary investigations has its own problems.”

a. Patel AR, Alton TB, Bransford RJ, et al. Spinal epidural abscesses: risk factors, medical versus surgical management, a retrospective review of 128 cases. *The Spine Journal* 2014;14:326–30. doi:10.1016/j.spinee.2013.10.046.

b. Street KJ, White SG, Vandal AC. Clinical prevalence and population incidence of serious pathologies among patients undergoing magnetic resonance imaging for low back pain. *The Spine Journal* 2020;20:101–11. doi:10.1016/j.spinee.2019.09.002

Management of patients with acute non-specific low back pain

Most people with acute non-specific low back pain have a favourable prognosis and can expect a significant improvement in their symptoms within six weeks.² Subsequent relapse, however, is common with many people experiencing a recurrent episode within one year of the original episode.² Over 40% of people with acute low back pain that has not improved within six weeks may go on to develop chronic low back pain and associated disability (see: “Persistent low back pain”).²


Pain is an individual experience influenced by multiple factors, including the biomedical process, patient perception, pain history, ability to cope, mental wellbeing and family and cultural background.¹⁹ Studies suggest that influencing the beliefs, misconceptions and attitudes about back pain is an essential component of successful management and in achieving optimal health outcomes for the patient.²⁰



Best Practice Tip: When discussing non-specific low back pain, avoid language that promotes belief about structural damage, e.g. “degeneration” or “wear and tear”, and language that promotes fear and catastrophic thinking, e.g. “avoid bending or lifting”, “let pain be your guide”, “stop if you feel pain” or “you have to be careful”.^{2,21}

Table 2. Symptoms and signs of radiculopathy, radicular pain and somatic referred pain.^{1,3,4}


	Symptoms and signs
Radiculopathy – occurs due to neural compression	<ul style="list-style-type: none">■ Objective loss of sensory or motor function (due to conduction block in axons of a spinal nerve or its roots)■ Numbness or paraesthesia in dermatomal distribution■ Weakness or loss of function (L1 – S1), e.g. footdrop■ Reduced leg reflexes (knee jerk for L3 – 4, medial hamstring for L5, ankle jerk for S1)■ May or may not be associated with radicular pain
Radicular pain – occurs due to nociceptive discharge of a nerve root or dorsal root ganglion typically in the presence of inflammation, with pain being felt in the peripherally innervated structures of the affected nerve	<ul style="list-style-type: none">■ Leg pain greater than back pain (and not temporally linked to back pain)■ Unilateral leg pain radiating caudally in a narrow band in a quasi-dermatomal distribution, with possible skip regions■ Sharp, lancinating, deep as well as superficial pain■ Leg pain exacerbated by coughing, sneezing or straining■ Positive crossed or straight leg raise test or positive slump test (L4, L5, S1, S2)■ Positive femoral stretch test (L2, L3, L4)■ Occasionally there are symptoms and signs of radiculopathy
Somatic referred pain – occurs due to nociceptive fibre convergence from the lower back onto second order neurons in the dorsal horn that also receive input from the lower limb	<ul style="list-style-type: none">■ Dull, deep ache, like an expanding pressure■ Referred pain concurrent with back pain, i.e. if the back pain resolves, or flares, then so does the referred pain■ Pain can be referred as far down as the foot when severe with possible skip regions■ Pain initially felt widely with difficult to perceive boundaries; pain remains in one location once established■ Absence of neurological symptoms or signs■ Can co-exist with radicular pain

 For information on the management of patients with radicular syndrome, see: “Management of patients with radicular syndrome”

Cauda equina syndrome – a diagnosis not to be missed

Cauda equina syndrome is a clinical syndrome that occurs as a result of mechanical compression of the descending lumbar and sacral nerve roots causing pain and progressive neurological deficit.¹⁶ The most common cause of cauda equina syndrome is a large central herniation of a lumbar intervertebral disc.¹⁶ Other possible causes include tumours, trauma, infection, spinal stenosis or spondylolisthesis.¹⁶ Table 1 lists features associated with cauda equina syndrome. However, vigilance is required as some clinical features are non-specific with poor diagnostic accuracy.¹⁷ Most cases of cauda equina syndrome are of sudden onset and progress rapidly within hours or days.¹⁰ However, for some patients, symptoms develop slowly and pain may be absent.¹⁰

Prompt referral and treatment is essential to provide the best outcome for the patient and to prevent the progression of symptoms and any permanent neurological deficits.¹⁷ Generally, patients with cauda equina syndrome require decompressive surgery within 48 hours, and if this occurs there is a favourable prognosis.¹⁷

 **Cauda equina syndrome is an emergency, request acute orthopaedic or neurosurgical assessment.**¹⁰

As part of general management advice:^{2,4}



Involve the patient in their management plan and discuss what has or has not worked for them in the past, including allied health services. Ensure patients have a realistic expectation of what a pain management strategy will achieve. A treatment regimen that resolves all pain is not usually possible.



Give practical reassurance, i.e. using facts and logic, not emotional reassurance, of the favourable prognosis and benign nature of acute non-specific low back pain



Discuss coping strategies, including distraction techniques, to manage an acute flare. A free online Australian pain coping course is available from: www.paintrainer.org/login-to-paintrainer/



Encourage all patients with low back pain to minimise bed rest, maintain activity and exercise and return to normal work and daily activities at the earliest possible opportunity. Explain that experiencing pain does not always mean harm and that some level of pain is to be expected with increased activity.



For further information on the principles of acute pain management, see: <https://bpac.org.nz/2018/acute-pain.aspx>



Read more from Dr Steinberg on his methods for managing back pain, including the "8 Cs" to maximise patient outcomes and avoid the nocebo effect

"Management of acute low back pain is targeted at patient complaints: 'I hurt', 'I can't move', 'I can't work' and 'I'm scared'.^a Effective patient education should involve an explanation for their pain, information about their prognosis and reassurance. The patient should be taken seriously, be seen, be heard and be believed.

The explanation does not need to be academically 'valid'. For example, the patient can be told that they have a small disc tear that is inflamed and sore but that the odds are in their favour, and they have every chance of making a good recovery. Discussing muscle tension as a factor in pain and using leg cramp as an analogy can dovetail nicely into recommending stretching. A discussion about the inability to make a biomedical diagnosis is not helpful, and patients with acute pain should not be told that pain can be psychosomatic. They should also be educated on the extremely low chance of a serious cause, and even lower because of the lack of red flags.

There are 8 Cs for what constitutes a good explanation that maximises patient outcomes and avoids the nocebo effect¹

- **Calm:** to avoid reinforcing patient fear
- **Clear:** the explanation should be understandable
- **Credible:** it should be believable and fit their circumstances
- **Confident:** it should be delivered with conviction, as any uncertainty can be picked up by the patient and worsen fear
- **Convincing:** it should address any uncertainties while monitoring the response to the explanation
- **Concerted:** the patient should feel that the clinician is making an effort
- **Caring:** the clinician should display a caring attitude
- **Concern:** the patient should be taken seriously

The explanation starts with commentary during the examination, e.g.:

- **Spinal range of motion:** 'The way you move your spine is just fine'
- **Reflexes:** 'Your reflexes are great, there are no signs of any trapped nerves'
- **Power:** 'Your back and core seem quite strong, and your muscles are good even though they hurt'

The patient should be told that pain does not necessarily mean harm and some increase of pain with movement and exercise may be a sign of stimulating healing, and at least a low level of pain is expected with any beneficial activity. A useful analogy is telling the patient 'Astronauts in space with limited movement and gravity have weak spines, marathoners have strong spines'. If the pain is very severe, they can be instructed to be judicious and find activities that are less painful than others. Try to move in a relaxed way and frequent stretching is good for you.'^b

Commentary continues over page

Patients should be informed that there is substantial evidence that resuming normal daily activities, including work, as soon as possible will aid the healing process.^b 'Bones, joints and muscles will have improved function, become stronger and more flexible and therefore less painful'.^b Furthermore, explain that distraction is a proven natural pain-killer.^b

Along with explanation should come reassurance about prognosis. Many guidelines state that most patients will have full resolution of pain and function at six weeks but the evidence on this is actually quite conflicting. Very wide ranges of recovery rates have been reported in different studies which may be due to differences in definitions of recovery and clinical care. One systematic review found that around two-thirds still had pain at 12 months.^c The prognosis can be improved with concerted care and following evidence-based guidelines,^d and so the patient should be informed that they have every chance of recovering if they are managed well but it may take some time. Note that the gold standard care of acute low back pain in primary care requires significant time resources likely not achievable in most practices in New Zealand due to funding and time constraints. For example, the initial evidence-based appointment requires 50 minutes, and so pragmatism and shortcuts are required in New Zealand with the current funding models.

The reassurance should be cognitive in nature not emotional.^e Emotional reassurance only has a transient positive effect, and the fears can return after the consultation has ended.^e Cognitive reassurance looks at using reason to shift the patient's thoughts and beliefs of their problem.^e

The patient's expectations and preferences should be met.^b For example, if a physiotherapy referral is being considered then the patient should first be asked what they think about that.^b 'Do you have any thoughts or previous experiences with physiotherapy?' The patient may have tried physiotherapy several times in the past without any effect or it only provoking pain. Similarly for analgesics, ask the patient about their previous experiences and current preferences before routinely prescribing."

a. King, W and Bogduk N. Acute low back pain. In: Bonica's Management of Pain. 2018.

b. Lærum E, Indahl A, Sture Skouen J. What is "the good back-consultation"? A combined qualitative and quantitative study of chronic low back pain patients' interaction with and perceptions of consultations with specialists. *Journal of Rehabilitation Medicine* 2006;38:255–62. doi:10.1080/16501970600613461.

c. Itz CJ, Geurts JW, van Kleef M, et al. Clinical course of non-specific low back pain: a systematic review of prospective cohort studies set in primary care: clinical course of non-specific low back pain. *EJP* 2013;17:5–15. doi:10.1002/j.1532-2149.2012.00170.x

d. McGuirk B, King W, Govind J, et al. Safety, efficacy, and cost effectiveness of evidence-based guidelines for the management of acute low back pain in primary care. *Spine* 2001;26:2615–22. doi:10.1097/00007632-200112010-00017.


e. Traeger AC, Hübscher M, Henschke N, et al. Effect of primary care-based education on reassurance in patients with acute low back pain: systematic review and meta-analysis. *JAMA Intern Med* 2015;175:733. doi:10.1001/jamainternmed.2015.0217

Risk stratification can be used to direct management

A risk stratification approach to the management of people with low back pain is increasingly being adopted internationally.² This enables the early identification of patients who are at risk of developing chronic low back pain and associated disability (see: "Identify and manage psychosocial risk factors, i.e. 'yellow flags'").¹⁸

Screening tools may help with tailoring the management approach

STarTBack is a validated screening tool that assesses biopsychosocial risk factors, including fear avoidance and catastrophising, as prognostic markers for chronicity and stratifies patients into low, medium or high-risk groups.¹⁸ Patients classified as low/medium risk have a more favourable prognosis and can be managed with less intensive interventions, e.g. reassurance and advice on remaining active.²² More intensive interventions should be considered for patients who are classified as high risk, e.g. cognitive behavioural therapy (or mindfulness-based therapy) and structured exercise programmes.^{18, 22}

 For further information on STarTBack, see: <https://startback.hfac.keele.ac.uk/>

Prioritise non-pharmacological interventions

As part of a shared-decision making process, discuss non-pharmacological management strategies with the patient, considering their preferences, potential harms and associated costs and availability of the intervention(s).^{22, 23} Pharmacological treatments are usually reserved for people with severe pain, although may be required initially to support patients while they return to their normal routine and daily activities, and during the introduction of non-pharmacological interventions (see: "Acute treatment with analgesia, if required – but with a plan to stop").²

Examples of non-pharmacological interventions that may be discussed include:^{2, 8}



Movement and activation, e.g. gradual increase in intensity of exercise, simple stretches to reduce muscle tightness, physiotherapy (although specific evidence of effectiveness in low back pain is limited)



Superficial hot or cold applications, e.g. use of a hot pack, taking regular warm baths or showers, using a spa or sauna. Some patients may prefer cold, e.g. ice pack.



Relaxation techniques, e.g. yoga, meditation/slow breathing, mindfulness



Distraction techniques, e.g. reading a book, listening to music, socialising, returning to work

Some patients may find other treatment modalities useful, e.g. osteopathy, chiropractic treatment, acupuncture or therapeutic massage. However, there is limited evidence of benefit for any of these modalities in acute non-specific low back pain.^{5,9,21} As part of a shared-decision making process, discuss the balance of benefit and affordability of allied health treatment, any past experiences they may have had with allied health services and how to look for a good provider by discussing their treatment approach and making sure that it is based on a biopsychosocial model.



Read more from Dr Steinberg on allied health treatments

“There is a lot of overlap in the approaches between different allied health practitioners; different training programmes have hugely differing philosophies, and so it isn’t fair to judge individual practitioners based on the stereotype of their profession. For example, some physiotherapists have training in spinal manipulation and use it judiciously with good effect, and some chiropractors don’t routinely use manipulation and spinal radiographs. It is therefore useful to know the approach of one’s local providers and have pre-determined whether they are evidence-based.

Talk to your local providers about their philosophy and approach. Ask patients what their allied health provider did to treat them to build up a picture of the providers in your area. Red flags include provider over-reliance on passive modalities such as massage, acupuncture, therapeutic ultrasound, routinely obtaining spinal radiographs and telling the patient that their vertebrae are ‘out of alignment’ or ‘subluxed’, as well as pushing patients into having large numbers of short appointments and never discharging them. Look for evidence of a biopsychosocial approach to management and written feedback or other communication back to you. The patient should be strongly discouraged from engaging in long-term ‘spinal maintenance’ programmes that are promoted by some, but not all, alternative practitioners.”

Acute treatment with analgesia, if required – but with a plan to stop

There is limited evidence of the effectiveness of pharmacological treatments for acute non-specific low back pain. If an analgesic is required, prescribe short courses only at the lowest effective dose to avoid long-term dependence on medicines.² NSAIDs are generally the most useful analgesic for acute low back pain, but they may not be suitable for all patients. Pharmacological treatments should always be used alongside non-pharmacological interventions. Review the patient within one to two weeks to monitor progress and make treatment adjustments, as appropriate.²

Topical preparations. A topical NSAID, e.g. diclofenac sodium (not funded), or capsaicin cream (0.025% cream funded with Special Authority approval for patients with osteoarthritis) may be better tolerated than oral analgesics for some patients, although efficacy for low back pain is unclear.²⁴ A randomised controlled trial (including 746 participants with acute back/neck pain) in Germany found that participants applying a combination of diclofenac 2% + capsaicin 0.075%* and capsaicin alone, twice daily, for five days, experienced greater pain relief than participants applying placebo gel.²⁵ The analgesic effect of topical diclofenac alone was comparable to placebo.²⁵

Some patients may find topical rubefaciants such as ‘Deep Heat’ (menthol + methyl salicylate) or other anti-inflammatory balms, e.g. Anti-Flamme or Tiger Balm (cajuput oil + camphor + clove oil+ menthol + mint oil), effective, however, there is limited evidence of benefit.^{24,27}



For further information on rubefaciants, topical NSAIDs and capsaicin available in New Zealand, see: https://nzf.org.nz/nzf_5755

* This higher strength capsaicin cream is only funded in New Zealand for patients with post-herpetic neuralgia and diabetic peripheral neuropathy (with Special Authority approval)²⁶

Paracetamol. Paracetamol may be appropriate for some patients with acute low back pain, e.g. those who cannot tolerate NSAIDs, however, evidence has demonstrated no benefit when paracetamol is taken alone compared to NSAIDs or placebo for people with non-specific low back pain.^{2,9}

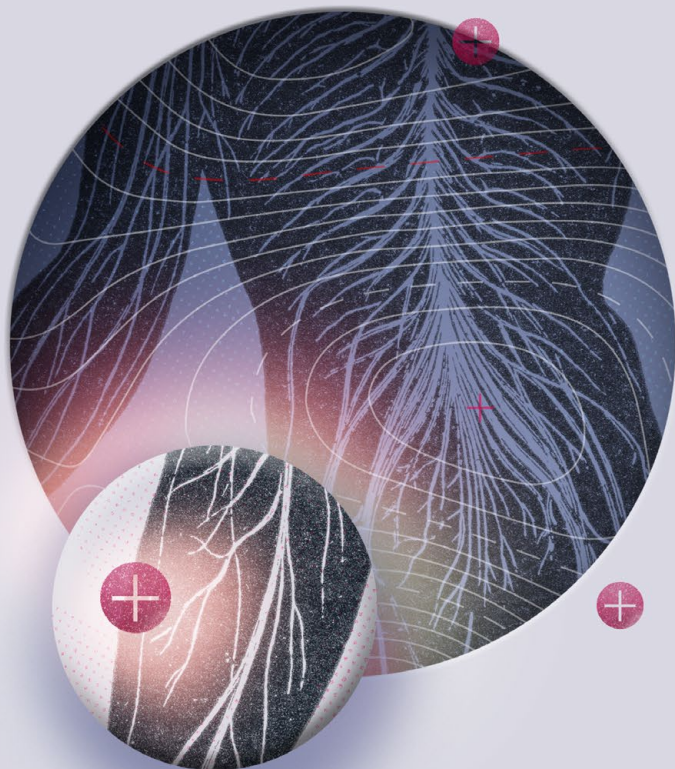
NSAIDs. A NSAID at the lowest effective dose is generally the recommended analgesic for patients with acute non-specific low back pain, if appropriate.^{*22} There is no difference in the efficacy between NSAIDs, however, people taking selective COX-2 inhibitors, e.g. celecoxib, may experience fewer gastrointestinal effects.²⁸

* Consider patient age, co-morbidities and potential gastrointestinal, liver and cardiorenal toxicity²²

Management of patients with radicular syndrome

The management of patients with radicular syndrome depends on their clinical presentation, however, conservative management is generally recommended first-line, e.g. reassurance, education, simple analgesics, movement, activation and “watchful waiting”.³ More intensive treatments such as tricyclic antidepressants are usually recommended second-line, however, there is limited evidence of efficacy.³ There is strong evidence that epidural corticosteroid injections via the transforaminal route are effective for some people with radicular pain; low quality evidence indicates potential benefit for people with lumbar spinal stenosis.³² Generally, in the absence of severe or progressive neurological deficit, surgery is only indicated in patients with radicular pain that persists for longer than four months.

Consider referral for patients with severe or progressive neurological deficit or for those who have persistent disabling symptoms for longer than six to eight weeks despite conservative management.^{3,18} Check your local HealthPathways for specific referral advice and timeframes. Patients with low back pain resulting from an accident may be able to access investigations or referral funded by ACC.



Skeletal muscle relaxants. There is limited evidence that muscle relaxants are effective for people with acute low back pain.²⁹ A short course (up to ten days) of orphenadrine may be appropriate for some patients with acute low back pain and associated muscle spasm; however, no difference in functional outcomes has been observed in people taking orphenadrine compared with naproxen.³⁰ Benzodiazepines should be avoided; no improvement in pain has been observed in people taking diazepam and naproxen compared to those taking naproxen and placebo.³¹

Weak opioids, e.g. codeine, tramadol, (taken with or without paracetamol) should only be recommended for a short duration in patients with severe low back pain or when NSAIDs are contraindicated, not tolerated or ineffective.^{2,22} Prescribe weak opioids with caution; the benefits of use must outweigh the potential risks.² The use of strong opioids should be avoided.²

 For further information on opioids for patients with acute pain, see: <https://bpac.org.nz/2018/opioids.aspx>

Gabapentinoids, e.g. gabapentin and pregabalin, should not be prescribed for patients with chronic non-neuropathic pain, e.g. non-specific low back pain, and are no longer recommended for people with sciatica due to a lack of benefit and evidence of harm.²²

Antidepressants, e.g. tricyclic antidepressants (unapproved indication), are best reserved for use in people with chronic low back pain or radicular pain (see: “Management of patients with radicular syndrome” and “Persistent low back pain”).⁸

Follow-up for patients with acute non-specific low back pain

A routine follow-up appointment should be scheduled two weeks after the initial consultation;² consider booking this at the initial consultation and advise the patient to cancel if their pain has resolved. Set measurable and realistic outcomes to assess treatment response, e.g. a reduction in pain score or the ability to perform a task or participate in an activity they could not do before. Pain diaries should be avoided as they encourage patients to focus on their pain, counteracting the goal of pain distraction.³³

At the follow-up appointment check the patients understanding of and adherence to the treatment regimen. If there is inadequate improvement in pain despite adherence to non-pharmacological interventions (and pharmacological, if required), consider reassessment – including, repeating a focused history and physical examination to rule out the development of any red flags that may indicate a serious underlying cause (especially if the patient had presented early

in the course of their pain), address any yellow flags that may be contributing to the delayed recovery and reinforce treatment recommendations (see: “Identify and manage psychosocial risk factors, i.e. ‘yellow flags’”).^{4, 18}

Expert tip: If it becomes apparent that the patient is at high risk of developing chronic low back pain, consider early planning for referral depending on the waiting lists of local musculoskeletal specialist providers.

Persistent low back pain

Despite gold standard care, some people with acute low back pain will develop chronic low back pain that persists or fluctuates for longer than three months.^{18, 22} Encourage these patients to return to primary care at regular intervals to ensure that symptoms are not progressing and that no red flags have developed that indicate a serious underlying cause. Some patients may also require regular review for ACC work- and medical certificate purposes.

Identify and manage psychosocial risk factors, i.e. “yellow flags”

When managing a patient with low back pain consider the presence of any “yellow flags”, that is, psychosocial barriers to recovery that are associated with an increased risk of persistent pain (Table 3).^{18, 21} This includes any unhelpful beliefs or attitudes that the patient may have about low back pain, e.g. that activity is harmful.^{18, 21} Educate the patient and address any fears and unhelpful tendencies, as required.

Expert tip: Yellow flags become increasingly important at each follow-up appointment. If there is concern about a patient with significant yellow flags, consider referral to a provider that offers techniques such as pacing, relaxation skills, graded activity, problem-solving training and behavioural modification; some physiotherapists may offer specialised programmes.

Table 3. Yellow flags in acute low back pain.^{1, 9, 18, 21}

<p>Behavioural</p> <ul style="list-style-type: none"> ■ Fear-avoidance behaviours, e.g. avoiding movement or activity for fear of making the pain worse, fearful of their prognosis ■ Inactivity or sedentary lifestyle with a preference for extended rest ■ High consumption of alcohol or other harmful substances ■ Smoking ■ Obesity ■ Feeling worthless, lack of self-esteem ■ Depression, anxiety or specific health anxiety, e.g. fear of procedures or needles ■ Fear or distress, often with hypervigilance ■ History of back pain ■ Lack of coping strategies and resilience ■ Tendency to catastrophise 	<p>Beliefs and attitudes</p> <ul style="list-style-type: none"> ■ Belief that pain and activity is harmful ■ Expecting pain with movement ■ Misinterpretation of significance of symptoms and magnification of symptoms ■ Belief that pain must be absent before returning to work and normal daily activities ■ Unrealistic treatment expectations or belief that pain is uncontrollable ■ Passive attitude towards rehabilitation ■ Poor motivation and adherence to treatment regimens ■ Previous negative healthcare experience ■ Excessive focus on their disability
<p>Social</p> <ul style="list-style-type: none"> ■ Social withdrawal or reduced interest in socialising ■ Lack of social support ■ Over-protective or conversely, non-supportive partner or family/whānau ■ Relationship stress ■ Low income or compensation issues ■ Low level of health literacy ■ Low socioeconomic status ■ Cultural factors 	<p>Work</p> <ul style="list-style-type: none"> ■ Physically demanding job ■ Unsupportive work environment ■ Poor job satisfaction ■ Work-related stress ■ Unsociable hours, e.g. shift work ■ Poor work history

Although evidence of conservative treatments for chronic low back pain is limited, first-line management generally consists of persisting with the same treatments as for acute low back pain, and may include education and reassurance, self-management strategies, e.g. use of a hot and cold pack, exercise/physiotherapy, and simple analgesics, e.g. paracetamol, NSAIDs.^{3, 8} Co-morbidities such as anxiety and depression should also be addressed and managed.⁵

Second-line care usually consists of more complex medicines*, e.g. tricyclic antidepressants, cognitive behavioural

therapy and multidisciplinary rehabilitation programmes, i.e. combining physical and psychological therapies, often in a group setting.^{3, 8, 18}

* Avoid prescribing opioids to patients with chronic low back pain²²

Consider referral if symptoms suggestive of a serious underlying cause develop or if pain persists after six months of appropriate management, or earlier if the pain is debilitating and significantly affecting the patients quality of life.¹⁸ Check your local HealthPathways for specific referral advice.



Read more from Dr Steinberg on managing a patient with chronic low back pain

“Unlike with acute low back pain, the causes and sources of chronic low back pain are largely known. Limited research has been done in the primary care context, however in secondary care about 40% have a disc source of pain, 30% have a facet joint source of pain and 20% have a sacroiliac joint source of pain.^{a, b} Some patients may have a significant myofascial component to their pain. Definitively determining the source of chronic low back pain can only be done using specialised physiological investigations such as diagnostic local anaesthetic blocks, not through imaging, and such investigations are usually not appropriate for most patients for various reasons.

As a whole, the evidence for conservative treatments for chronic low back pain is very limited; they either have no effect at all, or only have modest short-term effects. Treatments should be promoted as options that provide symptomatic relief rather than as a cure. Part of the problem with most chronic low back pain research is that it tends to lump all chronic back pain patients into the same group, and so any possible benefit for a particular subgroup is obscured.

Most patients with chronic low back pain don't have evidence of nociplastic pain (central sensitisation).^c Multidisciplinary team management is best suited for patients with nociplastic pain (e.g. chronic widespread pain and evidence of central sensitisation) and/or those with very high levels of psychosocial distress related to their pain. Spinal interventions for non-radicular chronic low back pain, such as injections, radiofrequency neurotomy and surgery generally play a limited role but may be considered in highly selected patients.”

a. DePalma MJ, Ketchum JM, Saullo T. What is the source of chronic low back pain and does age play a role? *Pain Med* 2011;12:224–33. doi:10.1111/j.1526-4637.2010.01045.x

b. DePalma MJ. Diagnostic nihilism toward low back pain: what once was accepted, should no longer be. *Pain Med* 2015;16:1453–4. doi:10.1111/pme.12850

c. Julien N, Goffaux P, Arsenault P, et al. Widespread pain in fibromyalgia is related to a deficit of endogenous pain inhibition. *Pain* 2005;114:295–302. doi:10.1016/j.pain.2004.12.032.



Clinician's Notepad: Acute low back pain

Assessment



Determine

- Site of pain
- Pain radiation patterns
- Mode of onset
- Aggravating and relieving factors
- Severity and functional impact
- Associated “red flag” features that may indicate fracture, infection, malignancy or cauda equina syndrome (see box)
- Any psychosocial factors that may influence recovery (“yellow flags”)



Perform a physical examination guided by relevant clues in the patient history

- Observe the posture, gait and general demeanour of the patient
- Assess spinal range of motion, as tolerated
- Palpate the spine to try to localise the pain and identify a vertebral level
- Assess for pain, swelling, deformity, muscle tone and heat. If infection is suspected, check body temperature.
- Palpate abdomen for abdominal mass or abdominal aortic aneurysm, if suspected
- Perform a neurological examination if neurological symptoms are present

- ✓ Diagnostic laboratory investigations, e.g. FBC, CRP, or imaging, e.g. lumbar X-ray, MRI, are not routinely recommended, unless there is suspicion of a serious underlying cause or if the results are likely to change management
- ✓ Exclude other possible causes of low back pain, e.g. referred visceral pain, pregnancy, vascular causes, axial spondyloarthritis, radicular syndromes

Red flags

- ! Aged > 50 years with new onset back pain, especially aged > 65 years
- ! History of malignancy with other features, e.g. unexplained weight loss
- ! Severe worsening or unrelenting pain, particularly at night or when supine
- ! History of trauma, or risk factors for fracture, e.g. osteoporosis, older age, prolonged systemic corticosteroid use
- ! Significant neurological symptoms, e.g. bilateral radicular pain or radiculopathy, impaired bladder/urethral sensation, urinary hesitancy or urgency, poor stream, loss of perineal sensation
- ! Symptoms or signs of infection, e.g. fever (> 37.8°C), night sweats or chills; or risk factors for infection, e.g. intravenous drug use, immunosuppression
- ! Cardiovascular risk factors for aneurysm, e.g. smoking history, hypertension, older age, male sex

Management of acute non-specific low back pain

- ✓ Involve the patient in their management plan and discuss what has or has not worked for them in the past, including allied health services. Ensure that patients have a realistic expectation of what a pain management strategy will achieve.
 - ✓ Give practical reassurance, i.e. using facts and logic, not emotional reassurance, of the favourable prognosis and benign nature of acute non-specific low back pain
 - ✓ Discuss coping strategies, including distraction techniques, to manage an acute flare
 - ✓ Encourage patients to remain physically active, minimise bed rest and return to normal work and daily activities as soon as possible. Explain that experiencing pain does not always mean harm
- and that some level of pain is to be expected with increased activity.
- ✓ Assess for risk of progression to chronic low back pain, e.g. using **STarTBack**
 - ✓ Prioritise non-pharmacological interventions, e.g. superficial hot-cold applications, relaxation and distraction techniques, exercise, physiotherapy
 - ✓ Pharmacological treatments have limited evidence of effectiveness and are usually reserved for people with severe pain, although may be required initially to support patients while they return to their normal routine and daily activities, and during the introduction of non-pharmacological interventions
 - ✓ If an analgesic is required, trial a NSAID (or paracetamol) and prescribe short courses only at the lowest effective dose to avoid long-term dependence on medicines. Pharmacological treatments should always be used alongside non-pharmacological interventions.

Follow-up

- ✓ Review the patient after two weeks of treatment to assess response
 - If there is not adequate improvement, consider reassessment, including repeating a focused history and physical examination to rule out the development of any red flags and address any yellow flags that may be contributing to delayed recovery
- ✓ If the patient has developed persistent low back pain:
 - Encourage them to return to primary care at regular intervals to ensure that symptoms are not progressing and that no red flags have developed
 - Continue with treatments used for acute pain, e.g. education, reassurance, self-management strategies and simple analgesics
 - Address and manage any co-morbidities, e.g. anxiety or depression
 - More complex medicines, cognitive behavioural therapy and multidisciplinary rehabilitation programmes are generally reserved for second-line care only if other interventions are not successful
 - Consider referral if symptoms suggestive of a serious underlying cause develop or if debilitating pain persists after six months of appropriate management

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