



Interventions in chronic low back pain

BACKGROUND Chronic low back pain presents a major challenge for general practitioners and is a significant drain on community resources. Patients often feel frustrated by modern medicine's apparent failure to validate their symptoms with a specific diagnosis and management plan.

OBJECTIVE This article presents an evidence based guide to current interventions, including an algorithm for the interventional diagnostic workup of low back pain that has persisted beyond 3 months.

DISCUSSION Modern imaging techniques rarely determine the cause of pain. The GP must look for 'red flag' clues in the history. Management of low back pain includes NSAIDs, simple injections of plain local anaesthetic without adrenalin or cortisone, referral to a masseuse, physiotherapist and/or a musculoskeletal pain physician. Specific management includes medial branch and sacroiliac joint blocks, and radiofrequency neurotomy. Patients with long term pain may be referred to a psychologist for cognitive behavioural therapy.

Chronic low back pain is a tremendous burden on individual patients, their families, workplaces, and the community at large. With a prevalence of 21%, it is the second most common chronic condition affecting Australians.¹ As well as the economic impact on the individual, there are significant psychological sequelae, which may be further exacerbated by the lack of a specific diagnosis. Modern imaging techniques such as computerised tomography (CT) and magnetic resonance imaging (MRI) scans rarely determine the cause of the patient's pain. This leaves both the patient and general practitioner in something of a quandary as to the best way to manage this difficult pain problem.

Red flags

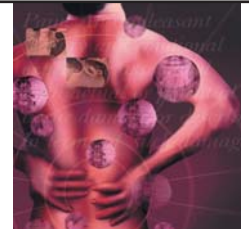
Most clues for any 'red flag' condition are found in the history and not in any special investigations or interventions. Thankfully, the pretest probabilities of cancer, infection, fracture and ankylosing spondylitis are all very low.²

Pretest probabilities

Pretest probabilities for major red flag conditions presenting to the GP are listed in *Table 1*. The key features that raise the clinical suspicion of cancer are:

- a previous history of cancer (this is by far the strongest indicator)
- weight loss
- age greater than 50 years
- prolonged pain
- night pain, and
- failure to improve.

If cancer is suspected, screening tests such as haemat-



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Table 1. Pre-test probabilities

Cancer	Less than 0.7%
Infection	Less than 0.01%
Ankylosing spondylitis	Less than 0.3%

SPOT CHECK

- 75% of chronic low back pain patients can have a target specific diagnosis made
- Red flags: most clues are in the history – not special investigations
- Radiofrequency neurotomy is the appropriate treatment for facet joint pain

ocrit, erythrocyte sedimentation rate (ESR), alkaline phosphatase (ALP) and imaging are indicated.

Prevalence

Essentially, all patients presenting with chronic low back pain fit the International Association for the Study of Pain’s diagnostic criteria for ‘somatic lumbar pain of uncertain origin’. Prevalence studies performed by a group of Australian and United States physicians determined that around 75% of this chronic low back pain patient cohort can have a target specific diagnosis made.^{3,4} Zygapophysial (facet) joint pain is found in around 15% of this patient group,⁴ this increases to between 40–50% in older populations.⁵

Sacroiliac joint pain has a prevalence of 20%⁶ and discogenic pain – caused by an internal derangement of the disc – has the highest prevalence, in the order of 40%.³ These target specific diagnoses can only be made reliably, however, by using diagnostic blocks performed under image guidance.

Management

Medications

Paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs) have limited to moderate evidence of some efficacy.⁷ The actual impact on pain scores is low. There is strong evidence that the various types of NSAIDs available are equally effective.⁷

In most studies antidepressants have been demonstrated to have no real impact on pain and depression scores in low back pain, although the doses have perhaps not been in the antidepressant therapeutic range. A recent study showed these to be slightly more effective than placebo in the short term. They are

often prescribed empirically to help patients with their sleep pattern.^{8,9}

Opioid medications need to be prescribed with care. There is evidence they are more effective than NSAIDs or placebo, but the average effect is only a one point reduction on a visual analogue scale of 1–10. They have not been demonstrated to improve functional status or psychological parameters.¹⁰

Simple injections

There is moderate evidence that simple injections of plain local anaesthetic or sclerosing agents (as in prolotherapy) may provide relief for up to 50% of patients.¹¹ This, however, is not significantly different to placebo treatments of injecting normal saline. It is reasonable for a GP to inject plain local anaesthetic without adrenalin or cortisone into tender muscle bands. Tender bony points can be injected as well using sclerosants or local anaesthetic mixed with an injectable anti-inflammatory product.

Referral

Massage

Patients may be referred for massage, for which there is evidence it may be more effective than ‘sham’ treatment or acupuncture.¹⁰

Psychologist

Patients who have had pain for more than 3 months may be considered for referral to a psychologist specialising in pain management for cognitive behavioural therapy (CBT). While the evidence for efficacy of CBT is limited (unless comparing to a long term waiting list with no management at all), there is face validity in helping patients learn coping mechanisms to feel more in control of their situation and to use imagery and other techniques in an attempt to minimise their suffering.^{12,13}

Physiotherapist/exercise physiologist

An intensive exercise program may have benefits for patients. Certainly, being stiff and inactive does not improve their situation. There is no evidence that strengthening exercises are better than other forms of exercise.¹⁴

Musculoskeletal/pain physician

There are a number of interventional pain management physicians in Australia who can provide accurate, targeted diagnostic blocks under image guidance to make a target specific diagnosis and implement target specific treatments.

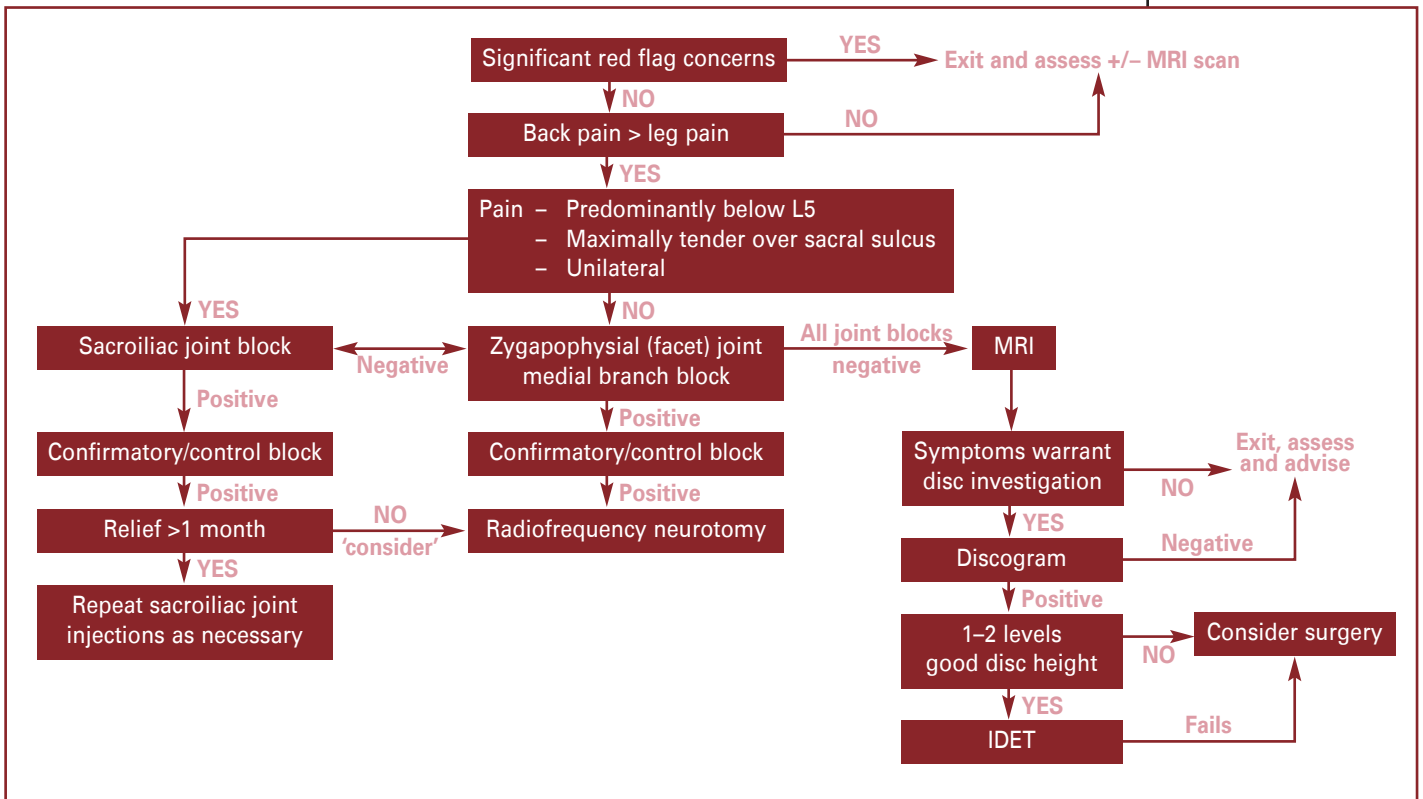


Figure 2. Australian Interventional Management Algorithm

Target specific diagnosis

Schwarzer et al^{3,4} determined that around 75% of patients referred to an interventional pain practice could have a target specific diagnosis made. While this can be performed to validate patients’ symptoms for themselves and/or other third parties, it is most commonly undertaken with a goal to implement a target specific treatment.

Sacroiliac joint pain

Sacroiliac joint pain has been long overlooked as a key source of chronic low back pain. Indicators include the patient pointing to the posterior superior iliac spine (buttock dimple) with a tender sacral sulcus, and their pain being predominantly below the L5 level.

Studies have demonstrated that when both these factors are present there is a sensitivity in the order of 90%. The positive predictive value is 60% for this patient group having sacroiliac joint pain.

Sacroiliac joint pain is more commonly unilateral. It is thought to arise from chronic inflammation within the joint and the deep interosseous ligament, which forms the posterior capsule and is the largest syndesmosis in the body. Sacroiliac joint pain pattern is predominantly in the buttock with 94% of sufferers

experiencing pain. It refers to the thigh in 48%, lower leg 28%, foot and ankle 13%, groin 14% and abdominally in 2% of patients.¹⁵ Injections to this joint (Figure 1) need to be performed with imaging guidance. Blind injections are intra-articular in only 22% of cases with 24% of blind injections having epidural flow and 44% having foraminal flow.

Zygapophysial (facet) joint pain

The joints most commonly affected are at the L4/5 and L5/S1 levels. As distinct from sacroiliac joint pain, zygapophysial pain is more commonly bilateral. Nonspecific tenderness can normally be elicited, a little infero-laterally from the spinous process and overlying the articular pillar. The most tender point can be marked and identified under fluoroscopy before the blocking procedure. It is common to perform a screening test block of the L4/5 and L5/S1 zygapophysial joints either unilaterally or bilaterally depending on the pain pattern symptoms.

The medial branch of the dorsal ramus supplies the nociceptive input from this joint. There is one branch above and one below the joint, therefore, two nerves need to be blocked to numb one joint. This is a neuro-anatomical approach that is more accurate than intra-articular injection and also carries therapeutic

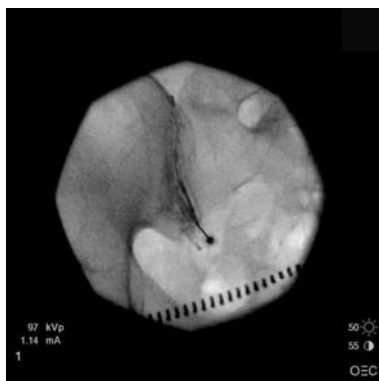


Figure 1. Sacroiliac joint injection

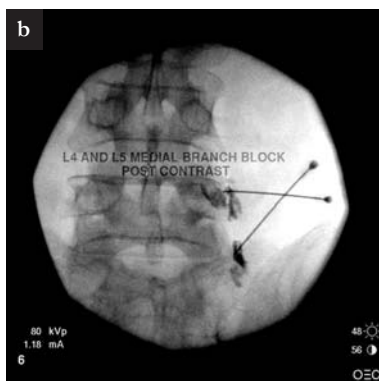
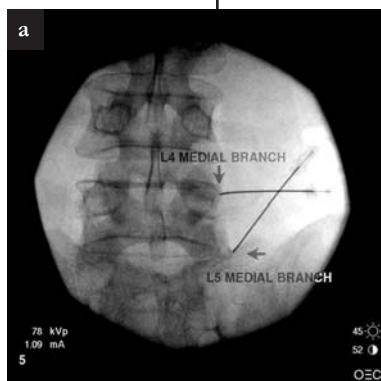


Figure 3a, b. Lumbar medial branch blocks pre- and post-contrast

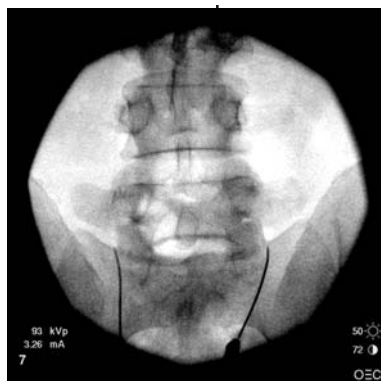


Figure 4. Radiofrequency of L5 bilaterally

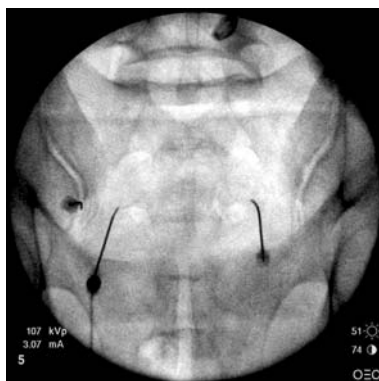


Figure 5. Radiofrequency S2 in sacroiliac joint radiofrequency procedure

validity as these are the nerves treated by radiofrequency neurotomy.

Facet joint injections do offer some short term benefits, but the difference between injection of anti-inflammatory agents and saline demonstrated that the effect may be no better than placebo.¹⁶ Further, there is increased risk of damage to the joint, and epidural flow through capsular tears.

A single medial branch block diagnostic test increases diagnostic confidence but there is a substan-

tial problem with false positive results in the order of 25–35%. For patients who have an initial positive block there is a need to confirm this with a second confirmatory block, using a different anaesthetic agent. Generally lignocaine is used on one occasion and bupivacaine on the other. The pain scores are accurately recorded at 30 minute intervals along with the duration of relief.

For patients who have positive blocks on two occasions with concordant duration of pain relief, there is a diagnostic confidence in the order of 90% that they truly have zygapophysial (facet) joint pain.

Discogenic pain

Internal disc disruption occurs when the internal architecture of the disc becomes deranged despite the outer contour possibly being normal. It is thought that abnormal stresses on the disc – particularly torsion and flexion and associated lifting – may cause damage to the vertebral endplates or tear the outer annulus. The prevalence of discogenic pain has been demonstrated to be 40%. Magnetic resonance imaging findings of a high intensity zone or moderate to severe modic changes (type I or II) in the vertebral endplates are associated with a much higher specificity for discogenic pain.^{17,18} That is, they increase the pretest odds for the patient having discogenic pain. If the MRI is pristine then the chance of the patient having discogenic pain is substantially less, and the pretest odds are reduced to around 5%. The only valid method of diagnosing this entity is by provocation discography.¹⁹

The Australian Interventional Management Algorithm

The Australian Interventional Management Algorithm (Figure 2) varies in its order from the International Spinal Injection Society (ISIS) algorithm recommended for the United States. The ISIS algorithm would have each patient commence with an MRI scan and be considered for discography as their first intervention, for all patients who did not have a pristine MRI. The problems with performing this first in Australia include the cost and accessibility of MRI scans and the more involved nature of discography. Further, treatments for disc pain including intradiscal electrothermal annuloplasty (IDET), fusion or disc replacement are either more controversial and therefore less established, or substantially more invasive. Also, the data for these management options is much less compelling than that for radiofrequency neurotomy of the lumbar synovial joints.

Medial branch blocks and sacroiliac joint blocks are

easily and readily performed as outpatient procedures for the majority of patients. The results are immediately apparent, the risks are less, and any subsequent decision to undertake radiofrequency neurotomy is better validated (*Figure 3a, b*).

Management

Radiofrequency neurotomy

An efficacy study performed by Dreyfuss²⁰ on patients who had undergone placebo controlled medial branch blocks demonstrated high efficacy for lumbar medial branch neurotomy (*Figure 4*). At 12 month follow up, 60% of patients still had 90% relief and 90% of patients still had 60% relief. A number of reports have confirmed there is no difference in outcome between litigants versus nonlitigants, including worker's compensation cases. It is performed as a day case procedure, and is repeatable should the effects wear off as the nerve regenerates and heals over time.²¹

Radiofrequency neurotomy has a long history in the management of lumbar zygapophysial joints and is an emerging therapy for sacroiliac joint pain (*Figure 5*).²² At the sacroiliac joint level the procedure is made more complex by variability in nerve supply, therefore, early studies have reported the efficacy rate to be more in the 65–70% range.

Intradiscal electrothermal annuloplasty (IDET)

Intradiscal electrothermal annuloplasty may be considered for well selected patients with confirmed discogenic pain. This procedure is performed percutaneously and generally only requires day case admission. A landmark randomised placebo controlled trial by Pauza²³ has demonstrated its efficacy. Along with a number of 2 year outcome studies, there is now substantial evidence that around 20% of patients will have complete relief despite many years of incapacitating pain, and that around 60% of patients will have at least a 50% relief of their pain longer term.^{24–26} Significant improvements have been demonstrated in SF36 bodily pain scores, Oswestry Disability Index and Beck Depression ratings.²³ Sitting, standing and walking time increase significantly for the successfully treated group.²⁵

There is minimal risk of complication or side effects and it does not preclude the patient from going on to more major surgery such as fusion at a later date should they be in the failure group.²⁶

Summary of important points

- Red flag conditions are rare.
- Most patients have never had a validated diagnosis of their back pain.
- 75% of chronic low back pain patients can have a target specific diagnosis made.
- Zygapophysial (facet) and sacroiliac joint pain are diagnosed by controlled anaesthetic blocks that numb the pain.
- Radiofrequency neurotomy is a well validated interventional treatment for proven zygapophysial joint pain and is an emerging treatment for sacroiliac joint pain.
- Discogenic pain is diagnosed by provocative discography, ie. provoke the pain. This is the most common cause of chronic low back pain and the most commonly overlooked.
- IDET is a percutaneous treatment for discogenic pain with demonstrated efficacy in a randomised control trial.

Conflict of interest: none.

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