

# A 28-year-old woman with radicular pain

**JAMES JARMAN** MBChb, FANZCA, FFPMANZCA, PGCertClin US

**CARL GRAHAM** BSc(PsychHons), MAppPsych

**LYNDAL WEIGHTMAN** BAppSc(Physio), PGradDipMTh

**KATHRYN BENSON-ROONEY** BAppSc(Physio), PGradDipMTh

A pain specialist, a psychologist and two physiotherapists discuss their own particular aspect of care of this patient with increasing pain in her right leg.

## Case scenario

A 28-year-old female zoo keeper has increasing pain in her right leg. This has been recurring over the past three years, but the interval between episodes has been steadily decreasing. It is usually relieved by a week's worth of over-the-counter NSAIDs and a change of work duties. However, the latest episode has required her to take time off work.

No allergies are reported and the only other medication she takes regularly is the oral contraceptive pill. Her past history includes falling from a cantering horse as a young teenager. She has tried pregabalin, but this was not tolerated.

Since the break up of a long-term relationship several months ago, she has gained 6 kg in weight, which is also associated with her current inactivity due to pain.

The patient has undergone an MRI, which showed a disc rupture with protrusion into the right spinal canal at L5-S1. She has been referred to an orthopaedic surgeon, but as she has no private insurance she is on a waiting list for discectomy at a public hospital.

What can be done for this patient now?

## Commentary from a pain specialist

By James Jarman

### Multidisciplinary approach

As with all patients with chronic pain, this woman requires attention to the physical and psychological aspects of her pain. The therapeutic challenge lies in appropriately weighting the different components of her multidisciplinary pain management plan. In this case the history of a recent relationship break up makes psychological input particularly important. There is a strong mind-body link in pain, and evidence has shown psychological techniques have excellent efficacy in treating chronic pain. They appear to alter brain neurotransmission, specifically enhancing descending pain inhibition.

Likewise physical activity improves pain tolerance, mood and sleep, which are commonly dysfunctional and closely interlinked in chronic pain. Patients with chronic pain have a narrowed 'window' of exercise tolerance – too little worsens pain, whereas too much can cause a pain flare. Liaison with a physiotherapist to formulate an individual plan is important.



## Key points

- Symptoms and signs of pain should be correlated carefully with imaging, as there is often poor concordance between imaging and clinical features.
- Multiple medications may need to be trialled for patients with chronic pain to find the most effective regimen.
- Pain is significantly affected by co-occurring psychosocial factors, and their influence should be quantified early in the process.
- The patient's own response to pain, injury and disability requires assessment.
- Education is a key priority, with reassurance that despite being wait listed for surgery, there are movements, activities and exercises that the patient is safe to do in an appropriate, paced manner.

PAIN MANAGEMENT TODAY 2015; 2(2): 31-36

Dr Jarman is a Pain Specialist at Joondalup Hospital, Perth and Anaesthetist at Swan District Hospital, Perth. Mr Graham is a Clinical Psychologist in private practice and at Fiona Stanley Hospital, Perth. Ms Weightman and Ms Benson-Rooney are Senior Physiotherapists in the Pain Management Department, Sir Charles Gairdner Hospital, Perth, WA.

**Cause of the pain**

Looking at this patient's history, one could assume that the pain in her leg is due to compression of the L5 nerve root. However, it is worthwhile correlating her symptoms and signs carefully with the imaging, as there is often poor concordance between imaging and clinical features. Asymptomatic nerve root compression on MRI is common. Other conditions such as facet joint disease or common peroneal neuropathy from habitual leg crossing can also cause leg pain.

Although it is common for facet pain to radiate to the buttocks and thighs, radiation below the knee is uncommon. Facet pain tends to be aching and nondermatomal rather than the shooting or burning dermatomal pain of nerve root compression. Facet pain is worse in the back but radiates to the legs. It accounts for about 10% of all cases of chronic back pain, although this increases to 40% in patients aged over 60 years. Her history of a fall from a horse increases the likelihood of facet joint disease (if there has been spinal trauma), as does her history of response to NSAIDs. Pure neuropathic pain generally responds poorly to NSAIDs. She may have a combination of background chronic facet joint arthropathy with superimposed nerve root compression. Facet joint pain could be diagnosed with a diagnostic medial branch block under fluoroscopy and treated with medial branch radiofrequency neurotomy. The possibility of a contribution to the pain from structures within the leg also needs to be considered in addition to the radicular/neuropathic and referred mechanisms discussed above.

**Pharmacotherapy**

It is worth noting that the efficacy of medication for chronic pain is modest at best, and individual variability in response is high. Multiple medications may need to be trialled to find the most effective regimen. However, when patients do respond there is often an improvement in mood and function as well as pain and this can happen fairly quickly.

Assuming a neuropathic contribution to the pain, a reasonable first-line agent for this woman is duloxetine. This would be an

off-label use as duloxetine is only approved for depression, anxiety and diabetic neuropathic pain in Australia. Duloxetine 60 mg once daily was recently shown to be superior to pregabalin 150 mg twice daily for diabetic neuropathic pain in a head-to-head comparison in the first part of a large multinational trial (Combination versus Monotherapy of Pregabalin and Duloxetine in Diabetic Neuropathy study).<sup>1</sup> In the second part of this study the combination of pregabalin and duloxetine at these same doses was marginally superior to high doses of either drug alone in initial nonresponders. A randomised controlled trial has also shown duloxetine to be effective, at least over the short term, in patients with non-neuropathic pain states such as chronic low back pain and osteoarthritis pain.<sup>2,3</sup> A case can be made for extrapolation of data from diabetic neuropathic pain to other types of neuropathic pain.

Duloxetine is generally nonsedating and does not cause significant weight gain. The benefits of duloxetine on pain are independent of its beneficial effects on mood and anxiety, which are an added bonus in this case. Increasing central nervous system noradrenaline levels can be helpful in people with chronic pain, which is why selective serotonin reuptake inhibitors are minimally effective for pain compared with serotonin and noradrenaline reuptake inhibitors, such as duloxetine. Duloxetine can be commenced at 30 mg once daily for seven days (to allow tolerance to nausea), and then increased to the therapeutic dose of 60 mg once daily. The main adverse effect is nausea, which leads to cessation of the drug in about 25% of people. This is worse in the first week and improves significantly with time if it can be tolerated. It could be paired with an antiemetic if needed. Some degree of improvement after a week on the 60 mg dose should be seen if the drug is going to be effective.

If the patient cannot tolerate duloxetine or it is ineffective, the drug should be ceased, and a night-time dose of nortriptyline, initially 10 mg titrating up to 50 mg over one to four weeks as tolerated, should be trialled. This is also an off-label use.

If nortriptyline is not effective, an

alternative would be to explore the nature of her adverse reaction to pregabalin. Frequently a starting dose of 75 mg twice daily is not tolerated due to daytime dizziness or somnolence but a 25 mg night-time dose is well tolerated and improves pain and sleep. This can be titrated up to 75 mg or even 150 mg at night-time before adding a daytime dose of 25 mg. Pregabalin is one of the few sedating medications that improves sleep quality subjectively and on electroencephalogram.<sup>4</sup> Opioids and benzodiazepines worsen sleep architecture and quality. Sleep quality is disrupted in people with chronic pain and poor sleep leads to increased pain. Pregabalin also has anxiolytic properties, which may be helpful in people with chronic pain.<sup>5</sup> Weight gain can occur in a minority of patients, so will need to be monitored. Pregabalin is listed on the PBS for neuropathic pain.

Generally, opioids should be avoided in a young woman such as this, particularly one with significant psychosocial stressors. However, if no other medications were effective there is the possibility of an opioid trial with a view to time-limited use (and the potential to stop after surgery if not before). Tramadol (PBS listed for pain) should be trialled first (if she is not on high doses of other serotonergic medications).

If tramadol is not tolerated, the new combination of weak opioid and noradrenaline reuptake inhibitor tapentadol, starting at 50 mg twice daily, with an opioid contract, and a clear plan to wean and cease the medication after surgery, would be the preferred opioid choice. Tapentadol 50 mg twice daily provides analgesia equivalent to 10 mg twice daily of oxycodone controlled release but with half the rate of gastrointestinal side effects. It has a much weaker opioid effect, has improved safety in overdose (based on only two case reports) and has shown to be efficacious against neuropathic pain.<sup>6,7</sup> It is also listed on the PBS for chronic severe disabling pain.

An alternative to tapentadol would be buprenorphine patches. Buprenorphine has the advantages of not worsening pain via opioid-induced hyperalgesia, which other opioids can do, as well as a lack of adverse hormonal effects and a ceiling to respiratory

depression.<sup>8</sup> Buprenorphine is listed on the PBS for chronic severe disabling pain.

From a procedural point of view an epidural steroid injection could be useful. An interventional radiologist could perform this if access to a pain clinic is limited. Epidural steroids are a controversial area but are generally considered to be effective for short-term relief of radicular (leg) pain. They are not recommended for axial (back) pain. This may buy the patient some time while awaiting her discectomy.

It is also worth noting that the natural history of a prolapsed disc is resorption, typically over six to 12 months, which contributes to a reduction in pain. Newer procedures such as pulsed radiofrequency to the dorsal root ganglion are also emerging potential nonsurgical treatment options for radicular pain.<sup>9</sup>

### References

1. Tesfaye S, Wilhelm S, Lledo W, et al. Duloxetine and pregabalin: high dose monotherapy or their combination? The 'COMBO-DN study' – a multinational, randomized, double-blind, parallel group study in patients with diabetic peripheral neuropathic pain. *Pain* 2013; 154: 2616-2625.
2. Skljarevski V, Desai AH, Liu-Seifert H, et al. Efficacy and safety of duloxetine in patients with chronic low back pain. *Spine* 2010; 35: E578-E585.
3. Chappell A, Ossanna M. Duloxetine, a centrally acting analgesic, in the treatment of patients with osteoarthritis knee pain: a 13-week, randomized, placebo-controlled trial. *Pain* 2009; 146: 253-260.
4. Hindmarch I, Dawson J. A double blind study in healthy volunteers to assess the effects on sleep of pregabalin compared with alprazolam and placebo. *Sleep* 2005; 28: 187-193.
5. Rickels K, Pollack MH, Feltner DE, et al. Pregabalin for treatment of generalized anxiety disorder. A 4-week, multicenter, double-blind, placebo-controlled trial of pregabalin and alprazolam. *Arch Gen Psychiatry* 2005; 62: 1022-1030.
6. Vaidvelu N, Timchenko A, Huang Y, Sinatra R. Tapentadol extended-release for treatment of chronic pain: a review. *J Pain Res* 2011; 4: 211-218.
7. Vaidvelu N, Huang Y, Mirante B. Patient considerations in the use of tapentadol for moderate to severe pain. *Drug Healthc Patient Saf* 2013; 5: 151-159.
8. Pergolizzi J, Aloisi AM, Dahan A, et al. Current knowledge of buprenorphine and its unique pharmacological profile. *Pain Practice* 2010; 10: 428-450.
9. Koh W, Choi SS, Karm MH, et al. Treatment of chronic lumbosacral radicular pain using adjuvant pulsed radiofrequency: a randomized controlled study. *Pain Medicine* 2015; 16: 432-441.

### Commentary from a psychologist By Carl Graham

In assessing this patient's case, it would be interesting to know more about the original context in which the ongoing pain problem had commenced. There is evidence that pain is significantly affected by co-occurring psychosocial factors and it would be important to quantify their influence early in the process, as well as now.

Co-occurring psychosocial factors include the issues of workplace dynamics and injured worker interaction, personality and coping style, family stress, and social wellbeing and support. Assessment of psychosocial factors can be easily carried out with the use of an Orebro questionnaire while patients wait for their appointment. Scores over 104 on the Orebro questionnaire indicate direct management of yellow flag issues is required to prevent excessive exacerbation of pain and disability.

The patient's own response to pain, injury and disability also requires assessment. Obvious comorbidities such as depression and anxiety can be accessed via clinical interview and the use of brief self-report tools, such as the Depression Anxiety Stress Scale-21. The cognitive attributions of patients to their pain, injury and disability need to be established as these issues will impact on patient engagement in treatment and their treatment compliance.

If there is evidence of catastrophic responding in relation to pain or fear avoidance, referral of the patient to a psychologist with pain management experience might be indicated. The Tampa Scale of Kinesiophobia and the Pain Catastrophising Scales are common assessment instruments to assist with identifying these issues. Pain catastrophising and fear-avoidance behaviours have been identified as key barriers to functional improvement in patients experiencing chronic pain.

Additionally, boom and bust style engagement in physical activity is well known to exacerbate pain problems and leads to decreasing function over time and increasing central sensitisation problems. An assessment of workplace demands, ergonomics and the patient's own expectations

would be indicated by the case description above.

This patient's report of relationship disturbance and weight gain warrant attention and I would support the use of a mental health plan referral to a clinical psychologist for mood disturbance secondary to chronic pain. The psychologist should incorporate treatment compliance and self-management of pain as part of the overall mood management process. It would be normal for assessment of the patient's psychosocial milieu to be conducted by the psychologist and it would be important to identify what social supports the patient is able to access and what additional psychosocial pressures might also be affecting her mood and pain.

Setting appropriate return to work and general function goals can be carried out with the patient and communicated between all healthcare professionals involved in the case. My experience indicates that a return to unsustainable levels of work or exercise too early is related to extended disability periods and is ultimately unproductive. As part of treatment, a paced return to former activities (start on a baseline of current activity capacity without pain flare minus 20% with a weekly increase of time on the task of 10%) can be routinely established. The patient's capacity to cope with a staged increase would inform my recommendations for time off work and the rate of return to work tasks.

### Commentary from the physiotherapists

By Lyndal Weightman and Kathryn Benson-Rooney

Physiotherapy assessment and management for this patient who has increasing radicular pain and now needs time off work requires a clear understanding of her pain story, pain beliefs and coping strategies. When combined with a thorough assessment, this provides a clear clinical picture to formulate a treatment program aiming to optimise her functional outcome.

Although imaging (MRI) has shown a potential structural source of symptoms for this patient, the association between findings on MRI and clinical outcomes remains

controversial.<sup>1,2</sup> The effectiveness of surgery for patients with sciatica due to lumbar disc herniation is not without dispute.<sup>3</sup>

The biopsychosocial model is now a widely accepted approach to the management of chronic pain.<sup>4</sup> This model conceptualises pain as a complex multifactorial interaction of biological, psychological and social components that play a role in the development, exacerbation and perpetuation of pain.<sup>5</sup>

The patient's perspective and her pain beliefs should be explored.<sup>6,7</sup> Three beliefs that have a particularly strong influence include fear avoidance, pain self-efficacy and catastrophising.<sup>6</sup>

This patient may have developed avoidance/protective behaviours leading to a perpetuation of symptoms and physical deconditioning, and consequently more pain. She may perceive she has a 'weak back' after falling from a horse as a child. Furthermore, the diagnosis of a disc rupture requiring surgery may make the patient fearful that physical activity could cause serious harm. Issues that have added to her psychosocial burden include time off work because of pain, the break up of a long-term relationship and the inactivity due to pain. Recent weight gain is likely to be an issue, as may inability to participate in her usual pleasurable activities or hobbies.

### The patient's story

A physiotherapist's examination will endeavour to determine a number of factors from the patient's history. Questions that can be asked include:

- How did the pain start, and was there an initial injury? (This may relate to current fear avoidance or movement patterns)
- Does the story indicate increasing deconditioning?
- Are descriptors indicative of neuropathic pain?
- What aggravates and eases the pain?
- Does pain correlate with the radiology?
- Is there a boom and bust approach to work and activity resulting in the more frequent flare ups?
- What is her walking/sitting tolerance?
- Is it pain or fear of pain causing her to limit her usual activities?
- What is the patient's previous experience of physiotherapy or similar? What was the patient's response?
- What are the patient's short- and long-term goals?

A physiotherapist may use questionnaires, such as the Pain Self-Efficacy Questionnaire<sup>8</sup> and the Roland Morris Disability Questionnaire.<sup>9</sup> The Short-Form Orebro Musculoskeletal Pain Screening questionnaire may help to identify people with high psychological risk status.<sup>10</sup>

### Physical assessment

Physical assessment would include a baseline neurological examination. Neurodynamic testing may be useful (e.g. straight leg raise, slump, prone knee bend).<sup>11</sup>

Active movements of the lumbar spine, as well as functional activities and postures (movement pattern and independence), and repetitive active lumbar movements may be examined. Movement and/or control impairments should be considered, and whether these



are adaptive or maladaptive to the underlying pathological process.<sup>12</sup> This will guide the therapist. For example, is there excess trunk muscle co-contraction? There is growing evidence that altered movement patterns and increased trunk muscle co-contraction are associated with the recurrence and persistence of low back pain.<sup>7</sup> Further strength and flexibility testing will be driven by the movement patterns and impairments found as the examination progresses. Specific physical examination findings are correlated with the patient's presentation (pain and functional impairment). Is there suggestion of central sensitisation, for example, hyperalgesia or allodynia?<sup>13</sup>

Physical functional tests, such as the six-minute walk test, forward functional reach, timed up and go, and sit to stand, are useful as part of the initial assessment and provide a valuable reassessment measure.

It is likely a patient with a chronic condition has been performing previously prescribed (including self-prescribed) exercises or movements. These may be inappropriate or being executed incorrectly and exacerbating pain and poor movement patterns.

### Management plan

Education is a key priority. This will include reassurance that despite being wait listed for surgery, there are movements, activities and exercises that the patient is safe to do in an appropriate, paced manner. Fear reduction is important. Examination findings will determine the treatment and advice given to the patient. For example, if she has a maladaptive movement or control impairment that is exacerbating her pain it is important to address this. It may be necessary to change movement behaviours that provoke pain and find ways to reinforce new functional movement patterns. The use of practical demonstration and mirrors may assist the patient in achieving this. If her presentation is adaptive around radicular symptoms, it will be important to guide the patient with movements and exercises that are not provocative.

A good understanding of a paced approach to activity and exercise is essential to regaining function with fewer flare ups. Both avoidance of activity and overactivity are associated with poorer patient outcomes.<sup>14</sup> When used as an 'active' (e.g. to increase strength and activity tolerance) versus a 'passive' (e.g. pain avoidant) coping strategy,

## CASE STUDY CONTINUED

activity pacing may help patients who have pain to function better and cope more effectively.<sup>15</sup> Pacing is not 'pushing through' the pain. Pacing uses a time-contingent or measured approach to activities and possibly positions, such as sitting or standing. The examination will inform the choice and appropriateness of activities, exercises and positions for pacing. The measure (time, counting, distance) dictates when to stop the activity, so that activity tolerance is gradually increased. Pacing also involves breaking activities into smaller packages.

Increasing evidence reveals structural and functional changes within the central nervous system in people with chronic musculoskeletal disorders, which appear to play a prominent role in the pathophysiology of these disorders.<sup>16,17</sup> Neuroplastic changes may be associated with alteration in motor performance, which may be a factor for the maintenance of pain.<sup>18</sup> A rehabilitation program should aim to address this.

A daily paced program of cardiovascular exercise, such as walking or cycling, should be commenced if possible, with a baseline set and clear guidelines given regarding a paced increase.<sup>19</sup> This may also benefit sleep, mood and cognitive factors.

A paced approach to other pain-aggravating activities, such as sitting, house chores and other functional postures or behaviours, should be implemented. An analysis of work-related tasks will help inform both the short- and long-term functional goals. Her exercise program will be directed towards achieving these. Ergonomic advice may be required.

A physiotherapy program with suitable graded, paced exercises is more likely to be beneficial in a multidisciplinary framework if possible. A biopsychosocial approach allows the clinician to provide the patient with the knowledge, understanding and skills to reduce both the pain and disability.<sup>20</sup> Liaison with, or referral to, a psychologist may be valuable, especially if there are significant psychosocial comorbidities.

As the patient is not insured, a long intensive course of treatment may not be feasible. However, establishing an active self-management program, with education and graded exercise is an important treatment goal that can be achieved in a low number of sessions. Physiotherapy input via clinical sessions may initially occur weekly and follow up will depend on the patient presentation and response. Patient-specific functional goals will drive physiotherapy management and the monitoring of progress.

Ultimately, the physiotherapist aims are to engage with the patient to actively manage her pain using evidence-based chronic pain knowledge. The attainment of functional goals, increased control of pain with fewer, less intense flare ups, along with psychological intervention provide best outcomes for patients in a multidisciplinary setting. A period of well-targeted conservative management may alleviate the need for surgery or improve surgical outcomes by the patient being better physically and mentally prepared. This patient should be encouraged and given hope that she has the potential to significantly improve her function and return to work and possibly avoid surgical intervention.

**PMT**

## References

1. el Barzouhi A, Carmen LA, Vieggeert-Lancamp CL, et al. Magnetic resonant imaging in follow-up assessment of sciatica. *N Engl J Med* 2013; 368: 999-1007.
2. Deyo RA, Mirza SK, Turner JA, Martin BI. Overtreating chronic back pain: time to back off. *J Am Board Fam Med* 2009; 22: 62-68.
3. Jacobs WC, van Tulder M, Arts M, et al. Surgery versus conservative management of sciatica due to a lumbar herniated disc: a systematic review. *Eur Spine J* 2011; 20: 513-522.
4. Gatchel RJ, Peters ML, Fuchs PN, Turk DC. The Biopsychosocial approach to chronic pain: scientific advances and future directions. *Psychol Bull* 2007; 133: 581-624.
5. Gatchel RJ, Theodore BR. Evidence-based outcomes in pain research and clinical practice. *Pain Pract* 2008; 8: 452-460.
6. Main CJ, Foster N, Buchbinder R. How important are back pain beliefs and expectations for satisfactory recovery from back pain? *Best Prac Res Clin Rheumatol* 2010; 24: 205-217.
7. O'Sullivan P. It's time for a change with management of non-specific chronic low back pain. *Br J Sports Med* 2012; 46: 224-227.
8. Nicholas MK. The pain self-efficacy questionnaire: taking pain into account. *Eur J Pain* 2007; 11: 153-163.
9. Roland M, Morris R. A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain. *Spine (Phila Pa 1976)* 1983; 8: 141-144.
10. Linton SJ, Nicholas M, MacDonald S. Development of a short form of the Orebro Musculoskeletal Pain Screening Questionnaire. *Spine* 2011; 36: 1891-1895.
11. Butler, D. *The Sensitive Nervous System*. Adelaide: Noigroup Publications; 2000.
12. O'Sullivan P. Diagnosis and classification of chronic low back pain disorders: maladaptive movement and motor control impairments as underlying mechanism. *Manual Therapy* 2005; 10: 242-255.
13. Woolf CJ. Central sensitization: implications for the diagnosis and treatment of pain. *Pain* 2011; 152(3 Suppl): S2-S15.
14. Andrews NE, Strong J, Meredith PJ. Activity pacing, avoidance, endurance, and associations with patient functioning in chronic pain: a systematic review and meta-analysis. *Ach Phys Med Rehab* 2012; 93: 2109-2121.
15. Nielson WR, Jenson MP, Kardsorp PA, Vlaeyen JWS. Activity pacing in chronic pain. concepts, evidence, and future directions. *Clin J Pain* 2013; 29: 461-468.
16. Pelletier R, Higgins J, Bourbonnais D. Is neuroplasticity in the central nervous system the missing link to our understanding of chronic musculoskeletal disorders? *Musculoskeletal disorders* 2015; 16: 25.
17. Wand BM, Parkitny L, O'Connell NE, et al. Cortical changes in chronic low back pain: current state of the art and implications for clinical practice. *Manual Therapy* 2011; 16: 15-20.
18. Boudreau SA, Farina D, Falla D. The role of motor learning and neuroplasticity in designing rehabilitation approaches for musculoskeletal pain disorders. *Manual Therapy* 2010; 15: 410-414.
19. PainHEALTH. Pacing and Goal Setting. Available online at: <http://painhealth.csse.uwa.edu.au/pain-management-pacing-and-goal-setting.html> (accessed July 2015).
20. Lotze M, Moseley GL. Theoretical considerations for chronic pain management. *Phys Ther* 2015; April 16 [Epub ahead of print].

COMPETING INTERESTS: Dr Jarman has carried out two paid talks for bioCSL.

Mr Graham, Ms Weightman and Ms Benson-Rooney: None.