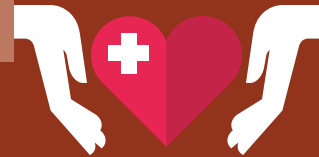


# check

Independent learning program for GPs



Unit 514 March 2015

# Pain management

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## **Published by**

The Royal Australian College of General Practitioners  
100 Wellington Parade  
East Melbourne, Victoria 3002, Australia  
Telephone 03 8699 0414  
Facsimile 03 8699 0400  
[www.racgp.org.au](http://www.racgp.org.au)

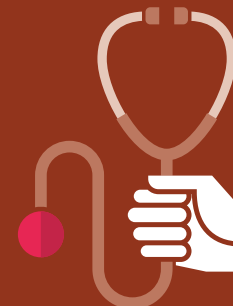
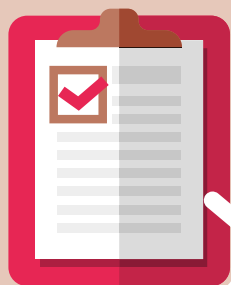
ABN 34 000 223 807  
ISSN 0812-9630

Published March 2015, Updated April 2015

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## Pain management

Unit 514 March 2015

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### The five domains of general practice

-  Communication skills and the patient-doctor relationship
-  Applied professional knowledge and skills
-  Population health and the context of general practice
-  Professional and ethical role
-  Organisational and legal dimensions

## ABOUT THIS ACTIVITY

Pain is a common medical condition and it is estimated that about one in five Australians experience chronic pain and about 5% (around 1 million) report that their pain has a significantly adverse impact on their quality of life.<sup>1</sup> Pain presentations were among the most frequent reasons for all patient encounters cited in a report on general practice activity in Australia in 2013–2014.<sup>2</sup> As the demand for Australia's multidisciplinary pain clinic services exceeds their capacity, the major burden for managing chronic pain falls on GPs.<sup>1</sup>

This edition of *check* considers common scenarios of pain management in general practice.

## LEARNING OUTCOMES

At the end of this activity, participants will be able to:

- outline the management of fibromyalgia
- list criteria required to make a diagnosis of chronic regional pain syndrome and chronic post-surgical pain syndrome
- explain the assessment of a person presenting with abdominal pain
- describe appropriate practices for prescribing opioids in pain management
- discuss the importance of assessing red and yellow flags in chronic back pain presentations.

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**ACRONYMS**

<b>ADL</b>	activities of daily living	<b>FSH</b>	follicle stimulating hormone	<b>PHN</b>	post-herpetic neuralgia
<b>ANA</b>	anti-nuclear antibody	<b>B-hCG</b>	beta human chorionic gonadotropin	<b>PNFS</b>	peripheral nerve field stimulation
<b>ATP</b>	adenosine triphosphate	<b>HLA</b>	human leukocyte antigen	<b>PRF</b>	pulsed radiofrequency
<b>BMI</b>	body mass index	<b>IASP</b>	International Association for the Study of Pain	<b>RSD</b>	reflex sympathetic dystrophy syndrome
<b>BP</b>	blood pressure	<b>LANSS</b>	Leeds Assessment of Neuropathic Symptoms and Signs	<b>SCS</b>	spinal cord stimulation
<b>BPI</b>	brief pain inventory	<b>LFT</b>	liver function test	<b>SLE</b>	systemic lupus erythmatosus
<b>CBT</b>	cognitive behaviour therapy	<b>LH</b>	luteinizing hormone	<b>SNRI</b>	serotonin and noradrenaline reuptake inhibitor
<b>CGRP</b>	calcitonin gene-related protein	<b>MCS</b>	microscopy, culture, sensitivity	<b>SSRI</b>	selective serotonin reuptake inhibitor
<b>CNCP</b>	chronic non-cancer pain	<b>MRI</b>	magnetic resonance imaging	<b>SSS</b>	symptom severity score
<b>CPIP</b>	chronic post-herniorrhaphy inguinal pain	<b>NPQ</b>	Neuropathic Pain Questionnaire	<b>STI</b>	sexually transmissible infection
<b>CPSP</b>	chronic post-surgical pain	<b>NSAID</b>	non-steroidal anti-inflammatory drug	<b>TCA</b>	tricyclic antidepressant
<b>CRP</b>	C-reactive protein	<b>PBS</b>	Pharmaceutical Benefits Scheme	<b>TGT</b>	tissue transglutaminase
<b>CRPS</b>	complex regional pain syndrome	<b>PCR</b>	polymerase chain reaction	<b>TFT</b>	thyroid function test
<b>CT</b>	computed tomography	<b>PDPN</b>	painful diabetic peripheral neuropathy	<b>TSH</b>	thyroid stimulating hormone
<b>DGP</b>	deamidated gliadin peptide			<b>VAS</b>	visual analogue scale
<b>DN4</b>	Douleur Neuropathique 4			<b>WPI</b>	widespread pain index
<b>ESR</b>	erythrocyte sedimentation rate				
<b>FBE</b>	full blood evaluation				

**CASE 1**

**MARGARET’S BACK HURTS**

Margaret, an office worker aged 53 years, presents to you for the first time with a history of lower back pain following a work-related incident. She currently takes oxycodone controlled release 80 mg (twice daily), diazepam 5 mg (2 tablets, three times a day), tramadol 200 mg (twice daily) and paracetamol 500 mg (2 tablets, four times a day) for her pain. She is unhappy that despite the use of these medications she has ongoing pain and is seeing you because she wants to change GPs.

**FURTHER INFORMATION**

After questioning, you discover Margaret’s back pain started after she slipped and fell at work about 2 years ago. She was seen in hospital at the time and X-rays of her back were reported as ‘normal’. She was prescribed paracetamol/codeine and diazepam, to help her back spasms. Over the next 2 months, however, her condition did not improve, so she visited her GP who ordered computed tomography (CT) scans, which showed bulging discs. She was also referred for physiotherapy, which she found was of no benefit. The pain continued to worsen, despite rest, and she has been becoming increasingly disabled and unable to perform most household tasks. The pain is described as a ‘dull ache’ that goes down both legs and is made worse by movement.

She has visited several GPs in the past 1.5 years and 6 months ago a new GP referred her to a surgeon. She says the surgeon is not doing much. She thinks an operation will fix her bulging discs and the surgeon is ‘just procrastinating’. She has not worked since the accident and has been on workers’ compensation. She worries that they may finalise her claim but her payout may be small, as she feels that they don’t take her pain seriously and they feel she is procrastinating. She expresses concern that she will never go back to work, that she and her husband will not be able to pay their mortgage and they will end up living on the street. She says she would rather be dead than have that happen. She says ‘only the oxycodone has offered any benefit but the dose is too small’. She also mentions that she has been feeling hot and cold, and has lost a few kilos in the last 6 months. Her husband is supportive and he quit his job to look after her. She says, ‘He makes sure that I am able to rest’.

**QUESTION 1** 

What aspects of this presentation are concerning?

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**QUESTION 2** 

What red and yellow flags are present in this patient? How would you manage these?

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**QUESTION 3** 

On the basis of Margaret's CT scan results, do you think she has neuropathic pain? What are the criteria for diagnosing neuropathic pain?

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**QUESTION 4** 

How will you determine if Margaret has neuropathic pain?

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**FURTHER INFORMATION**

On examination, Margaret seems thin and sacrospenic (having age-related loss of muscle mass), and is acutely tender around the region of lumbar segments L4/5. She ambulates slowly and holds her back with her right hand. Her movement is restricted in all directions in the back. Reflexes and straight leg-raising are normal. Her sensations (Von Frey filament, hot, cold and 128 Hz tuning fork) are symmetrical and normal. Margaret's body mass index (BMI) is 22 kg/m<sup>2</sup>, and temperature and blood pressure (BP) are in the normal range.

**QUESTION 5** 

What investigations would you consider? Why?

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**FURTHER INFORMATION**

A number of tests are ordered. Investigation results show:

- imaging results show no change
- follicle stimulating hormone (FSH) is raised and oestradiol reduced
- erythrocytes and liver function tests are all within normal ranges
- a clinical breast exam is normal
- erythrocyte sedimentation rate (ESR) is 12 mm/hour, which is within normal range
- thyroid stimulating hormone (TSH) is normal.

**QUESTION 6** 

Given the investigation results, together with the history and examination, what is the likely diagnosis?

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Investigating the red flags would include a physical examination, including looking for signs of infection (eg looking for areas of swelling, redness and tenderness), and investigation (eg blood tests to check if raised white cell count and/or erythrocyte sedimentation rate (ESR) are elevated).

The yellow flags may require referral to a psychologist specialising in pain, or addressing them directly by challenging the patient's beliefs, or a multidisciplinary pain management program that includes cognitive behavioural approaches, education and graduated physical reconditioning. These measures may sometimes prove difficult as patients often react adversely to any suggestion that 'you think the pain is in my head'. Being on any system involving pecuniary gain is a risk factor for developing chronic pain in itself. In addition, there may be factors that may present a barrier to returning to work, such as poor workplace relationships.

Past history may also be useful. This includes developmental history and any history of abuse, substance abuse disorder and childhood illness.

### ANSWER 3

The lack of hard evidence of a lesion in the nervous system consistent with appropriate signs and symptoms, would make a diagnosis of neuropathic pain unlikely. Neuropathic pain originates from a lesion or disease affecting the somatosensory nervous system.<sup>4,5</sup> The pain is typically described as being burning, painful, cold or feeling like electric shocks and can be associated with tingling, pins and needles, itching and numbness.<sup>6</sup>

Given Margaret's presentation so far, it is unlikely that she has neuropathic pain.

The International Association for the Study of Pain (IASP) special interest group on neuropathic pain has diagnostic criteria based on history, examination and diagnostic testing:

- The history has to suggest a nerve lesion.
- It has to be neuroanatomically plausible.
- The examination needs to reveal negative or positive sensory signs in the distribution of the suspected lesion, and/or motor signs of weakness in an anatomical nerve distribution.
- Diagnostic testing should confirm the lesion.

If only history is positive, a diagnosis of neuropathic pain is considered unconfirmed; if history and either examination or testing are positive, it is considered probable; and if all three are positive, it is considered definite.<sup>7</sup>

### ANSWER 4

Use of an appropriate screening tool and undertaking a neurological examination will help determine if Margaret has neuropathic pain.

Use of a validated screening tool, such as one of the neuropathic pain questionnaires listed below, can aid in screening and identifying patients with neuropathic pain:<sup>6</sup>

- Leeds Assessment of Neuropathic Symptoms and Signs (LANSS)<sup>8</sup>
- Douleur Neuropathique 4 (DN4)<sup>9</sup>
- Neuropathic Pain Questionnaire (NPQ)<sup>10</sup>
- PainDETECT<sup>11</sup>
- ID Pain.<sup>12</sup>

Neurological examination should consider:<sup>6</sup>

- Lower limb assessment:
  - assess gait, ability to squat and to walk balancing on heels then toes
  - tone
  - strength and coordination
  - specific tests (straight leg-raising).
  - reflexes
  - sensation (pain, light touch, cold and hot and vibration)
  - abnormal sensations (hyperalgesia, allodynia, etc).

### ANSWER 5

The following investigations could be considered for Margaret:

- A general blood screen to check her general health and to look for reasons for her weight loss and a possible malignancy (previously identified as possible red flags).
- FSH and oestradiol as she could be perimenopausal and having hot flushes, which might explain her feeling hot and cold.

Repeat imaging scans of the lumbar/sacral spine to look for any new pathology (possible red flag) or progression of disc bulges.

### ANSWER 6

The history and examination, including the results of Margaret's investigations, suggest the diagnosis is chronic or persistent back pain caused by deconditioning with persisting yellow flags. The yellow flags tend to potentiate pain by increasing central sensitisation, which results in ongoing pain, even though tissue healing has taken place. Pain causes kinesiophobia, or fear of movement, which then leads to prolonged and inappropriate rest, resulting in muscle and soft tissue weakness. The soft tissues are then easily damaged by movement, which results in more pain, completing the vicious circle.

Neuropathic pain is unlikely in Margaret's case. She does not have any examination findings or investigation findings that confirm the presence of neuropathic pain.

Her FSH and oestradiol results are consistent with her being perimenopausal and could explain her description of feeling hot and cold.

Her recent weight loss remains unexplained.

Chronic use of opioids, particularly at high doses, often results in the phenomenon of opioid hyperalgesia, where pain thresholds are paradoxically lowered and more pain is experienced for a given stimulus.



**ANSWER 7**

Margaret is most suited to the multidisciplinary treatment approach, which would include a pain specialist, psychiatrist, psychologist, physiotherapist and exercise physiologist.<sup>13–15</sup> The principles of treatment would be to tackle the identified yellow flags and consider pain control while embarking on a rehabilitation and strengthening program. After that, Margaret should be weaned off her analgesics. The long-term goal would be for Margaret to re-enter the work force.

A pain assessment tool can be used to assess and monitor the progress of Margaret's pain. Standard pain questionnaires, such as the Brief Pain Inventory (BPI)<sup>16</sup> or the McGill pain assessment questionnaire,<sup>17</sup> can be completed before the patient's visit to quantify their pain, and should be repeated every 2 months. In addition, aids such as the visual analogue scale (VAS) are also useful for assessing pain; however, some measures of functionality should also be used. Such tools allow for baseline pain assessments to be made and allow for monitoring of pain (eg improvement, no improvement) in response to pharmacological and non-pharmacological pain management strategies, such as exercise, physiotherapy and psychology.

**ANSWER 8**

The Hunter Integrated Pain Service recently produced guidelines<sup>18</sup> recommending that opioid therapy should not be initiated for the management of chronic non-cancer pain (eg chronic back pain), given the current lack of medical evidence for opioid efficacy and safety in the treatment of chronic non-malignant pain. For people already using opioids for management of chronic non-cancer pain, weaning off and cessation of opioids over a reasonable time frame is recommended. Deviations from the guidelines should be discussed with a pain or addiction specialist.<sup>18,19</sup> Currently, evidenced-based indications for opioid therapy include acute pain, cancer pain, palliative care and opioid dependence/addiction (opioid substitution therapy).

Before prescribing an opioid, the patient should first have a drug and alcohol history taken and/or be screened using a standard opioid risk tool. This identifies patients who may have problems with addiction or dependence issues.<sup>18</sup> A positive result does not necessarily exclude the use of opioids but may simply signal that precautions need to be taken, such as limited pickups from the pharmacy.<sup>20</sup>

Next, it should be determined whether the pain responds to opioids. This can be best achieved by using a pain management plan or a more formal agreement such as an opioid contract (also referred to as an opioid treatment agreement). These tools can be used to outline a plan for starting an opioid, as well as documenting functional goals and timelines. The contract should also determine the 'out' clauses, such as aberrant behaviour, when the opioid would be ceased. If this is established at an early stage, it would prevent any disagreements in the future. Lastly, the contract should contain a clause about how the opioid is to be ceased. Generally, a reduction of 5–10% every week or month should allow cessation with minimal withdrawal symptoms. Alternatively, reductions of 10–25% of the starting dose each month may be used to achieve cessation within 3–9 months.<sup>18</sup>

Opioid risk tools and standard treatment contracts are readily available on the internet (refer to the *Resources* section).

**ANSWER 9**

There is little evidence that long-term opioids offer any benefit in chronic non-cancer pain.<sup>19</sup> Long-term use of opioids results in opioid tolerance and hyperalgesia, which requires the dose of opioid to be continually increased to maintain the same amount of analgesia. Ultimately, the patient would need large doses of opioid, with very little, if any, analgesia.

Margaret's opioid treatment should be gradually tapered off and eventually ceased.<sup>18</sup> Tapering and ceasing opioid use would occur in conjunction with increasing her activity and addressing her yellow flags. This should put her into a positive cycle of increasing activity, strengthening soft tissues, resulting in less pain and decreased need for analgesia.

It should be explained to the patient that, in most cases, opioid treatment is simply a means to an end. Many patients can be apprehensive when their analgesia is withdrawn. They need to be reassured that they are stronger and more resilient against injury and will suffer less pain. In addition, it allows their own pain modulation systems to 'kick in' and their situation is now (since the start of their treatment) very different from when they started.<sup>15</sup>

**CONCLUSION**

This case illustrates a common scenario in general practice where there is an injury causing pain that does not get better. The case is a reminder of the importance of the psychological yellow flags in the progression of acute pain to chronic pain. The patient in this case would have been, most probably, unsuitable for opioid therapy and this illustrates some common challenges in pain management in general practice. It is important not to start an opioid or escalate dosage when the nature of the pain is not fully understood. These patients often search for answers to their problems and move from GP to GP, progressively getting worse, and becoming more difficult to treat. However, with the recognition of the problem and the cooperation of the patient, the situation can be reversed. The importance of patient education cannot be over-emphasised and resources such as the excellent video *Understanding pain* (available on YouTube) from the Hunter Integrated Pain Service are useful (refer to the *Resources* section).

**RESOURCES FOR DOCTORS**

- The National Prescriber Service provide useful tool for GPs to assist with the diagnosis and management of lower back pain, and information sheets tailored to the individual needs of a given patient, [www.nps.org.au/health-professionals/resources-and-tools/decision-and-management-tools/back-pain-choices](http://www.nps.org.au/health-professionals/resources-and-tools/decision-and-management-tools/back-pain-choices)
- The Hunter Integrated Pain Service website provides a detailed discussion of red and yellow flags, [www.hnehealth.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0003/28164/Guideline\\_flags.pdf](http://www.hnehealth.nsw.gov.au/__data/assets/pdf_file/0003/28164/Guideline_flags.pdf)

- The Hunter Integrated Pain Service videos available on YouTube for patient education, including:
  - *Understanding pain*, [www.youtube.com/watch?v=4b8oB757DKc](http://www.youtube.com/watch?v=4b8oB757DKc)
  - *Brainman chooses*, [www.youtube.com/watch?v=jlwn9rC3rOI](http://www.youtube.com/watch?v=jlwn9rC3rOI)
  - *Brainman stops his opioids*, [www.youtube.com/watch?v=MI1myFQPdCE](http://www.youtube.com/watch?v=MI1myFQPdCE)
- The Hunter Integrated Pain Service provides sample opioid agreements, [www.hnehealth.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0017/108701/Opioid\\_treatment\\_agreement\\_Mar\\_2013.pdf](http://www.hnehealth.nsw.gov.au/__data/assets/pdf_file/0017/108701/Opioid_treatment_agreement_Mar_2013.pdf)
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**ANSWER 3**

The patient's history and the results of the physical examination will guide which investigations should be ordered, as will the need to exclude relevant differential diagnoses.<sup>1,2</sup>

Appropriate investigations to order for Claire include:

- full blood examination (FBE)
- erythrocyte sedimentation rate (ESR)
- human chorionic gonadotropin blood levels (β-hCG) (to exclude pregnancy)
- urine microscopy, culture, sensitivity (MCS)
- stool MCS and polymerase chain reaction (PCR) (to exclude parasitic infections)
- coeliac serology on the basis of suspected correlation of symptoms to certain foods, the nature of her symptoms and her iron deficiently anaemia.<sup>3</sup>

Depending on a patient's initial symptoms and clinical findings the following investigations may also be considered:<sup>1,2</sup>

- vaginal swabs for chlamydia and gonorrhoea if pelvic inflammatory disease is suspected, as well as tests for other possible conditions if other sexually transmitted infections (STIs) are suspected or in the presence of genital symptoms<sup>1,2,4,5</sup>
- pelvic ultrasound may be indicated if cyclical pains are suspected
- laparoscopy may be indicated in case of suspected endometriosis.

Pelvic CT or magnetic resonance imaging (MRI) should not be routinely arranged but can aid further assessment of any abnormalities detected on a pelvic ultrasound (note Claire has previously had a CT scan).<sup>2</sup>

**ANSWER 4**

Positive antibody tests in those with clinical features suggestive of coeliac disease should be followed up by a gastroscopy for duodenal biopsy confirmation, which is the gold standard presently for confirming a diagnosis of coeliac disease).<sup>6–8</sup> Claire should be referred to a gastroenterologist for biopsy confirmation.

Blood tests for coeliac disease include tissue transglutaminase (tTG) antibody and deamidated gliadin peptide (DGP) antibody.<sup>6,7</sup> Antibody tests are also used to monitor a person's response to a gluten-free diet.<sup>3,8,9</sup> Note, coeliac serology can be negative in an undiagnosed coeliac patient if the patient was already following a gluten-free diet.<sup>9</sup>

An Australian serological study reported that at least 1 in 100 people have coeliac disease.<sup>8</sup>

A negative result for human leukocyte antigen (HLA) DQ2/DQ8 genetic testing excludes coeliac disease, given that the majority of people with these antigens do not have evidence of a gut abnormality on small bowel biopsy.<sup>3,8,9</sup>

**ANSWER 5**

The symptoms of histologically confirmed coeliac disease are extremely variable. The most common symptoms include lethargy,

diarrhoea, abdominal pain and indigestion; however, some people present without any gastrointestinal symptoms at all. Instead, these people present with complications associated with the presence of coeliac disease, such as osteoporosis and/or associated diseases (eg dermatitis herpetiformis). The presence of iron, folate, vitamin D or zinc deficiency should prompt a clinician to screen for coeliac disease.<sup>8</sup>

A number of possible complications are associated with coeliac disease. There is an increased incidence of autoimmune thyroid disease among patients with coeliac disease. Hypothyroidism is more frequent than hyperthyroidism.<sup>8,9</sup>

Coeliac disease is closely associated with type 1 diabetes mellitus<sup>8</sup> and polyglandular autoimmune syndrome type III, characterised by autoimmune thyroiditis combined with immune-mediated diabetes.<sup>9</sup> Coeliac disease is reported in about 3% people with type 1 diabetes.<sup>8</sup>

The incidence of eosinophilic esophagitis is increased in children and adults with coeliac disease.<sup>9</sup> A diagnosis of eosinophilic oesophagitis should be considered in patients with coeliac disease and dysphagia or persistent reflux.<sup>9</sup> Coeliac disease may be associated with non-specific mild chronic elevation in serum aminotransferase levels.<sup>3</sup>

**ANSWER 6**

It is important to provide Claire with information about her diagnosis, including its impact on her long-term health and wellbeing. Initial management of her coeliac disease, ongoing monitoring and the need for regular medical follow-up and annual review should be discussed. Testing of first-degree relatives is also recommended.<sup>3,7,8</sup> Note, first-degree relatives have about a 1 in 10 chance of developing coeliac disease.<sup>8</sup>

The following points are also important:<sup>3,7,8</sup>

- Initial management includes following a gluten-free diet for life. Foods containing wheat, rye, barley and oats need to be avoided, whereas gluten-free foods, including fresh meat, fish, chicken, eggs, seeds, nuts, fruit, vegetables, legumes, most dairy products, oils, margarine and butter may be eaten. Care needs to be taken when eating away from home and or consuming commercially prepared/packaged foods.
- Patients should be referred a dietitian specialising in coeliac disease, for provision of information and support.
- Encourage patients to contact the Coeliac Society of Australia, which provides members with information and support. Before they can join, they need a letter from a medical practitioner stating that they need to follow a gluten-free diet.
- Consumer information on coeliac disease is available from the Gastroenterological Society of Australia website.
- In terms of follow-up and regular review, repeated measurement of anti-transglutaminase or anti-endomysial antibodies is helpful when assessing a person's response and adherence to a gluten-free diet. However, it can take 12 months or more for antibody levels to return to normal.<sup>7</sup>

- All medications should be checked for possible gluten content. Ingredients derived from gluten-containing grains (eg wheat starch), are listed on the packaging. Note that maize starch is gluten-free and there is a gluten-free symbol in pharmaceutical reference books such as MIMS. Pharmacists can also provide advice on gluten-free drugs.
- Screen for associated diseases at the time of diagnosis (if not previously screened) particularly thyroid disease and diabetes, as well as micro-nutritional deficiencies (eg iron, folate) and treat or manage any problems identified in accordance with current guidelines.
- Advise use of calcium and vitamin D supplements to protect against further bone loss, as coeliac disease is associated with osteoporosis.

Even after making dietary changes, about 5% of patients respond poorly to a gluten-free diet. These patients may benefit from review by a dietitian, to ensure that all gluten has been removed from the diet. If they continue not to respond to a gluten-free diet, they should be referred to a gastroenterologist for review.<sup>8</sup>

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**CASE 3**

**LINDY ACHES ALL OVER**

Lindy, a music teacher aged 45 years, presents with 3 months of persistent aching and discomfort in her arms and neck. She has found it difficult to continue her usual activities because of increasing stiffness in her hands and is concerned she will not meet the deadline for her Graduate Diploma of Education.

Lindy has headaches and poor-quality sleep, waking up unrefreshed most mornings. She is fatigued throughout the day, often having to lie down in the afternoon to gain her energy. She reports diminished concentration and memory. Lindy has had to cut back on her previous exercise program because of muscular discomfort.

She has two children under the age of 10 years, one of whom has Asperger's syndrome. Her husband is very concerned about her wellbeing and has encouraged her to attend for review.

**QUESTION 1** 

What other clinical features need to be assessed?

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**QUESTION 2** 

What clinical examination features are relevant?

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**FURTHER INFORMATION**

On examination, Lindy looks well and is not febrile. There is no abnormality in the precordium, lungs or abdomen. Her joints are not tender or swollen but she does have widespread tenderness in muscle areas in all four quadrants of the body. This leads you to a working diagnosis of fibromyalgia.

**QUESTION 3** 

What investigations are relevant?

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**FURTHER INFORMATION**

You order a full blood evaluation (FBE), renal tests and liver function tests (LFTs), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), creatine kinase, rheumatoid factor, antinuclear antibody (ANA) and a thyroid function test (TFT). Lindy's blood investigations are all normal.

**QUESTION 4** 

How would you explain these normal results? How will you confirm your diagnosis?

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- A TFT might show hypothyroidism, which can cause generalised aches and pains.
- Creatine kinase levels are usually elevated in inflammatory muscle disease, although that condition does not usually cause widespread aches and pains.
- Follicle stimulating hormone (FSH), luteinizing hormone (LH) and oestrogen levels may indicate perimenopausal changes.
- ANA is a general screen for systemic lupus erythematosus (SLE) and similar autoimmune diseases but many patients have low titre positivity with this test because of its extreme sensitivity.

#### ANSWER 4

The results of Lindy's blood investigations are consistent with what might be expected in fibromyalgia, given that no consistently measurable investigational abnormality has been identified for fibromyalgia.<sup>5</sup> The results have also helped to exclude other potential explanations for Lindy's symptoms.

Most patients with fibromyalgia have a long history of pain-related symptoms over some decades. This might include dysmenorrhoea, migraine, irritable bowel syndrome or previous regional pain problems.<sup>1</sup>

Most patients with fibromyalgia have an identifiable trigger that usually has some psychological connotation. Typical examples of triggers include motor vehicle accident or work-related pain. Viral infections, where there is prolonged rest and inactivity, can trigger fibromyalgia. An Australian study of 150 consecutive patients attending a public hospital fibromyalgia clinic reported that 89% of patients described recognisable triggers.<sup>6</sup>

There are usually contextual clues in a patient with fibromyalgia. These include the frequent presence of stress factors in their background and the patient may seem more vulnerable to 'normal' stress because of poor coping skills, catastrophisation or lack of control in any given situation.

The key clinical features of fibromyalgia are widespread pain, unrefreshing sleep and widespread abnormal tenderness to gentle pressure, and previous diagnostic criteria have been based on these features.

More recently derived criteria are the American College of Rheumatology 2011 diagnostic criteria (*Figure 1*). These comprise reporting by the patient of:

- a high number of painful or tender sites in the body
- high levels of symptoms relating to:
  - poor sleep
  - cognitive dysfunction
  - other somatic symptoms such as headache, irritable bowel and depression.<sup>7</sup>
- fatigue.

There must be no other condition present that can explain the symptoms, which should be present for more than 3 months.<sup>7</sup>

#### ANSWER 5

It must be borne in mind that fibromyalgia is a disorder of function within the pain system whereby there is increased sensitivity of the pain-related pathways.<sup>1</sup> Fibromyalgia is a spectrum disorder and people with this condition have different levels of the characteristic clinical features at any one time. Fluctuations in symptoms are common. In addition, it is commonly present as a comorbid problem with a large number of other chronic illnesses.<sup>1</sup> For instance, patients with rheumatoid arthritis, SLE, inflammatory bowel disease and other chronic illnesses have 10 times the rate of fibromyalgia, compared with the normal 3–5% in the general population.<sup>1</sup>

The prognosis varies. In general, about 80% of patients with fibromyalgia have a mild-to-moderate fluctuating course.<sup>1</sup> Patients who learn to recognise triggers and circumstances that exacerbate their symptoms do best as they learn skills to manage their condition better. This is particularly so for patients who learn simple psychological stress management strategies and exercise regularly. About 20% of patients with fibromyalgia have more severe and persisting symptoms, which may be difficult to treat and often require advice and intervention by a number of specialists, working together.<sup>1</sup>

#### ANSWER 6

The first step in treating fibromyalgia is making an accurate diagnosis.<sup>8</sup> A North American internet-based study has reported that almost half of the patients consulted 3–6 healthcare professionals before being diagnosed with fibromyalgia.<sup>9</sup>

Treatment of fibromyalgia should consider the items below as well management of any comorbid conditions (eg concurrent depression) identified.

#### Multidisciplinary approach/patient management plan

The management of fibromyalgia often requires a multidisciplinary approach, although milder forms can usually be managed by the GP alone.<sup>3,8</sup> GPs can provide supportive care by developing patient management plans for patients using the Chronic Disease Management Medicare item numbers. GPs can also assist with the coordination of ongoing patient management, organisation of referral to specialists and/or allied healthcare providers, as well as regular patient reviews. The patient should be a central participant in the development of their management plan. The plan should include provision of patient education, an exercise program, psychological advice/support and often pharmacotherapy for pain management.<sup>3,8</sup>

#### Education

Once diagnosed, the nature of fibromyalgia needs to be explained to the patient. Background stresses and how the individual deals with these stresses should be explored.<sup>3,8</sup> Ideally, patients should be provided with written materials to support verbal discussions and referral to useful websites.

#### Exercise

Exercise is a key management strategy and usually involves graduated low impact 'go low-go slow' type programs, building aerobic exercise

over several weeks to months.<sup>3,8</sup> The type of exercise does not matter and may include activities such as walking, dancing, bicycle riding or swimming. Alternative exercise strategies include use of mind–body type programs such as yoga or Tai Chi. Mindfulness meditation strategies can be very effective. Regular exercise has been reported to improve pain, fatigue and sleep problems.<sup>8</sup>

**Psychology**

Some patients require help with psychological contributors to stress, and psychological review by a therapist who understands fibromyalgia can be extremely helpful.<sup>3,8</sup> The strategy should involve active, positive approaches rather than just ‘learning how to deal with the problem’. A 2010 meta-analysis reported that therapies such as cognitive behaviour therapy with relaxation or biofeedback resulted in significant improvements in overall pain, mood and disability.<sup>10</sup>

Many people with fibromyalgia have associated depression, which needs to be assessed and treated independently.<sup>8</sup> The patient needs to understand that depression does not cause fibromyalgia. Many patients with fibromyalgia are anxious and usually respond to psychological management strategies.

**Pharmacotherapy**

Milnacipran, a serotonin and noradrenaline reuptake inhibitor (SNRI) is the only drug currently licensed for the management of fibromyalgia in Australia; however, it is not available on the Pharmaceutical Benefits Scheme (PBS).

Other medications have shown benefit in improving symptoms of pain, tenderness and sleep function.<sup>1,5,11</sup>

- Low-dose amitriptyline (PBS general schedule, unrestricted), usually 10–25 mg in the mid evening, helps achieve better sleep and has

**Figure 1. The American College of Rheumatology 2011 diagnostic criteria for fibromyalgia are useful in clinical practice<sup>7</sup>**

- To use:
1. Add patient reported pain (or tender regions) present in last week to make up the **widespread pain index (WPI)** score – see left columns.
  2. Determine severity score of key common symptoms and add together to make up **symptom severity score (SSS)**
  3. Use the guide to determine if patient has fibromyalgia.
  4. Add WPI and SSS to make up the **polysymptomatic distress score**. This places the patient on a spectrum from low to high chance of fibromyalgia. If score is over 12 then fibromyalgia is likely. Note that the patient can also have other conditions, as well as fibromyalgia.

PAIN in last week <sup>#</sup>				SYMPTOMS in last week <sup>+</sup>				
Region	Centre	Right	Left	Symptom*	Score [0-3] #			
Neck	<input checked="" type="checkbox"/>			Fatigue	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wakening unrefreshed	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Shoulder girdle		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Cognitive symptoms	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Upper arm		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Other symptoms**	Headache <input type="checkbox"/> 1			
Lower arm		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Abdominal pain <input type="checkbox"/> 1			
					Depression <input type="checkbox"/> 1			
Chest	<input checked="" type="checkbox"/>			<b>TOTAL SYMPTOM SEVERITY SCORE [SSS = 0-12]</b>				
Upper back	<input checked="" type="checkbox"/>			_____ = _____				
Lower back	<input checked="" type="checkbox"/>			<b>Polysymptomatic distress score</b> = WPI _____ + SSS _____ [Fibromyalgianess score]				
				_____ = _____				
Hip		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Fibromyalgia diagnosis</b> = WPI ≥ 7 <input type="checkbox"/> PLUS SSS ≥ 5 <input type="checkbox"/> OR				
Abdomen	<input checked="" type="checkbox"/>			WPI ≥ 3 <input type="checkbox"/> PLUS SSS ≥ 9 <input type="checkbox"/>				
Upper leg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Criteria filled</b> = YES / NO				
Lower leg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Comments:</b> _____				
<b>Widespread pain index score [WPI = 0-19]</b>				_____ = _____				

+Symptoms present at similar level for 3 months – yes / no  
 No other explanatory diagnosis – yes / no  
 # Tick appropriate box and count  
 \*0 =no problem,  
 1 = slight or mild problems, generally mild or intermittent,  
 2 = moderate, considerable problems, often present and/or at a moderate level,  
 3 = severe, pervasive, continuous, life disturbing problems

effects on many of the fibromyalgia symptoms in about 40% of patients. Tolerance of the medication may be an issue and morning somnolence can be a particular problem.

- SNRIs such as duloxetine enhance the activity of the pain control pathways between the brain and the spinal cord, which are abnormal in many patients with fibromyalgia. These drugs can be beneficial in about 30–40% of patients. Nausea and sleep disturbance may occur in some patients.<sup>11,12</sup>
- The gabapentinoids such as pregabalin and gabapentin modify the release of excitatory pain chemicals, including glutamate, noradrenaline and substance P in patients with fibromyalgia. These drugs also give good benefits in about 30% of patients. Side effects can include dizziness, drowsiness and, sometimes, low levels of weight gain. There are a few cross-reactions between pregabalin and other medications.

In general, the drugs listed above will give a 50% improvement in pain and related symptoms in 30% of patients, and 30% of improvement in 50% of patients.<sup>1</sup> This means that about 50% of patients will not benefit from these drugs when used as monotherapies. Often, specialists prescribe combinations of these drugs, using low doses of, for example, amitriptyline and pregabalin or duloxetine and pregabalin.<sup>1</sup>

Analgesics for fibromyalgia can be simple drugs such as paracetamol in the usual doses. Anti-inflammatory medication can be beneficial in some patients because of the prolonged half-life of the drugs and their effect as analgesics. In addition, the anti-inflammatory effects can help patients who have concomitant osteoarthritic or spinal osteoarthritic pain.<sup>3,5</sup>

Tramadol can be useful in fibromyalgia in patients with moderate-to-severe pain that does not respond to other therapies,<sup>8</sup> but it has many cross-reactions with other drugs and increased levels of nausea. Tapentadol is a newer synthetic opioid, similar to tramadol. It has low-level opioid effects and inhibits noradrenaline reuptake in the spinal cord. In Australia, tapentadol is indicated for patients with severe pain not responsive to simple analgesics and is available on the PBS as a restricted benefit.<sup>13</sup> It can be useful for short periods in fibromyalgia if pain modulatory medication and simple analgesics fail.

Opioid use should be avoided in fibromyalgia. In general, pure opioids are not very effective in fibromyalgia, possibly because endogenous opioid mechanisms are activated in this disorder.<sup>8,14</sup>

Notably, selective serotonin reuptake inhibitors (SSRIs), which are extremely useful for depression, are not particularly effective in fibromyalgia.<sup>12</sup> Antidepressants that have some effect on the noradrenaline reuptake system, such as duloxetine, are the most beneficial. Some agents such as venlafaxine, at higher dose, will also have some benefit for fibromyalgia pain.<sup>1,12</sup>

## CONCLUSION

Lindy improved significantly with provision of patient education, leading to an understanding of the nature of her condition, initiation of a low-impact exercise program, recognition and better management of her life stressors and intermittent use of low-dose amitriptyline.

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**CASE 4**

**ANNA HURT HER ANKLE**

Anna, 46 years of age, has come to see you about a fall at home 4 weeks ago. She slipped and fell, inverting her right ankle. She experienced severe sudden pain, which improved a little initially but has continued to trouble her with swelling and bruising. The pain progressively worsened and a few hours later she went to her local emergency department. A plain X-ray showed no fractures and the hospital doctor reassured her that she probably had minor ligament trauma caused by her fall. Anna was advised to rest, use a cold pack if necessary and take paracetamol (modified release) and ibuprofen for a few days. Strapping of her ankle/foot for a few days was also suggested.

Anna says the pain is getting worse. She describes swelling, mottled skin and stiffness in her ankle and toes. She says the entire top of her foot is sensitive to touch and that she is unable to wear closed footwear. Her partner, who has accompanied her, reports that she is not sleeping well (which Anna confirms) and that she has been irritable.

**QUESTION 1** 

What would you look for during your examination?

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**QUESTION 2** 

What is the most likely diagnosis? What differential diagnoses should be excluded?

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**QUESTION 3** 

What investigations will you request to confirm your tentative diagnosis?

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**FURTHER INFORMATION**

Following your initial assessment you request blood tests for a full blood evaluation (FBE), erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), and a computed tomography (CT) scan of right foot. You commence Anna on treatment with a non-steroidal anti-inflammatory drug (NSAID), paracetamol and, for severe breakthrough, pain oxycodone 5 mg. You refer Anna to a physiotherapist.

Anna returns for a follow-up review 2 weeks later. There are no additional signs or symptoms of fever or weight loss and no evidence of infection. Anna's blood test results are within normal ranges. The CT scan shows some features of tissue oedema but no fracture.

The medication you prescribed has not been effective. Physiotherapy aggravated her condition and Anna discontinued this therapy after 2 visits. Anna believes her condition has worsened and her mood is altered. She has become depressed, angry, lacking sleep and is unable to participate in routine tasks at home.

**QUESTION 4** 

What are the main features of this condition?

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**FURTHER INFORMATION**

Four weeks later, Anna visits you for the third time. She reports that her pain has not settled and you decide to prescribe oxycodone, as she is not responding to the non-narcotic analgesics she is already taking.

At the next follow-up visit at week 6 (her fourth visit), Anna reports that the pain and discomfort are unbearable. Questioning reveals that the physiotherapist Anna visited tried passive therapy (heat and cold packs, ultrasound application and gentle mobilisation), which aggravated Anna's pain. As weight-bearing causes a great deal of difficulty, the physiotherapist provided her with Canadian clutches to assist ambulation. Apart from severe pain, Anna has noticed periodic excessive swelling, a tender foot, increased sweating and a change in the colour of her foot to a dark blue-purple, with smooth, shiny skin over the dorsum of foot. On examination her foot is extremely sensitive, even to light touch. Anna has taken photographs with her smartphone to show these periodic changes. Anna is depressed, fearful her condition is deteriorating rapidly, and requests further answers and possible referral to specialist care.

**QUESTION 5** 

What associated conditions may be present?

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**QUESTION 6** 

How will you manage Anna now?

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**CASE 4 ANSWERS**

**ANSWER 1**

The following should be considered when examining Anna:

- If tolerated, examine the ankle joint for range of movement and instability, to assess for ligament integrity.
- Assess for increased skin sensitivity and demarcate the zone as indicated in *Figure 1*.
- Check for the presence of allodynia or hyperalgesia (ie increased pain response to normal stimulation or increased response to an existing painful area).
- Check for skin trophic changes, oedema, stiffness of joints, moist skin, altered hair growth (hirsutism), change in nail texture, motor wasting, sensory changes, peripheral circulation, gait and posture.
- Assess for mood changes and changes in activities of daily living (ADL). For example, is Anna sad and depressed, crying or irritable, or does she have anger-related issues? Can Anna participate in her routine domestic tasks effectively (eg cooking, cleaning, making beds, ironing, driving, shopping and such other ADL)?



**ANSWER 2**

The symptoms are suggestive of complex regional pain syndrome (CRPS) type 1, previously called reflex sympathetic dystrophy syndrome (RSD). However, a diagnosis of CRPS requires exclusion of other conditions that could cause similar symptoms.

In the older nomenclature, the condition was divided into sympathetically maintained pain and sympathetically independent pain, as in some patients there may not be any evidence of sympathetic excess. Historically, the lack of appropriately and well-codified clinical diagnostic criteria and confusion over RSD and causalgia (a rare pain syndrome related to peripheral nerve injuries) limited accurate diagnosis, research and therapeutic advice, which created confusion in the clinical setting. The current terminology, as outlined by the Budapest Steering Committee Pain Medicine (2003)<sup>1</sup> and subsequently modified and ratified in 2012 by The International Association for the Study of Pain (IASP)<sup>2</sup>, reflects the currently accepted norm for diagnosis. In CRPS type 2 there is peripheral nerve injury in addition to the signs and symptoms of CRPS type 1.<sup>3</sup>

Differential diagnoses that need to be excluded when making a diagnosis of CRPS include, but are not necessarily limited to:<sup>4,5</sup>

- fracture
- infection of skin, muscle, joint or bone
- post-traumatic neuralgia
- associated connective tissue disorders
- acute arthritis, gout
- unilateral vascular disease, vasculitis
- thrombophlebitis
- metabolic, autoimmune or neoplastic disorders
- neuropathies
- psychiatric somatoform disorders.

**ANSWER 3**

CRPS is primarily a clinical diagnosis made on the basis of presenting symptoms and features, and exclusion of other possible conditions. There are no specific investigations for CRPS.<sup>5</sup> However, useful investigations to support the diagnosis of CRPS are:<sup>5,6</sup>

- Plain radiography: osteoporotic changes may present in the initial few weeks of the condition (Sudeck's atrophy).
- Bone scintigram (three phase) with technetium-99m may show delayed uptake in stages 1 and 2, and delayed, increased or symmetrical uptake in phase 3.<sup>4,5,7</sup>
- Magnetic resonance imaging (MRI) may reveal widespread oedema of deep connective tissues, muscle and peri-articular regions. MRI changes to focal nerve injury may be observed.
- Thermography may show temperature variations between the affected and normal limbs.

According to IASP criteria 26, the following are necessary to make a clinical diagnosis of CRPS:<sup>3,5</sup>

1. Continuing pain that is disproportionate to any inciting event.

2. At least one symptom in three of the four categories below:
  - sensory: hyperalgesia and/or allodynia
  - vasomotor: temperature asymmetry and/or skin colour changes and/or skin colour asymmetry
  - sudomotor/oedema: oedema and/or sweating changes and/or sweating asymmetry
  - motor/trophic: decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin).
3. At least one sign at the time of evaluation in two or more of the following categories:
  - sensory: evidence of hyperalgesia and/or allodynia (to light touch and/or temperature sensation and/or deep somatic pressure and/or joint movement)
  - vasomotor: evidence of temperature asymmetry (greater than 1°C) and/or skin colour changes and/or asymmetry
  - sudomotor/oedema: evidence of oedema and/or sweating changes and /or sweating asymmetry
  - motor/trophic: evidence of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin).
4. No other diagnosis better explains the person's signs and symptoms.

**ANSWER 4**

CRPS incorporates an array of painful conditions characterised by continuing (evoked and/or spontaneous) regional pain, which is seemingly disproportionate in a spectrum of time or degree to the course of any known trauma or other insult such as surgery. The pain is regional (not limited to a specific nerve distribution or dermatome) and usually has a distal predominance of abnormal sensory, motor, sudomotor, vasomotor, and/or trophic findings.<sup>4,5</sup>

The syndrome shows variable progression over time.<sup>6,8,9</sup> Generally, there is an acute phase, followed by subacute phase and, finally, a stable chronic phase. Generally, the duration of the initial two phases is 3–6 months and thereafter the chronic and stable phase sets in. In this final stage there may be permanent changes such as muscle wasting, ongoing pain in the affected region, dystonia, stiffness of joints, trophic change to cutaneous surfaces, as well as contracture of muscles and features of disuse atrophy.<sup>5,6,8</sup>

The pain is often described as burning, lancinating, shooting, electric-like sensations, tearing, deep ache and stinging, which may vary in type and intensity depending on physical activity or, at times, for no apparent reason.<sup>6</sup> Stress may also be a contributing factor.<sup>8</sup> The central mystery of this condition is why some patients develop symptoms, whereas others with seemingly identical injuries do not.<sup>10,11</sup>

Limbs, in particular, are more vulnerable to this condition, compared with the torso.<sup>12</sup> It has been postulated that microvascular dysregulation may be involved in the aetiology of CRPS. The distal ends of limbs have limited blood flow, requiring anti-gravity venous drainage, as any oedema further impedes circulation. This promotes an inflammatory response. Hypoxia resulting from the limited blood

flow impairs the vitality of the distal axon terminals. There may be a genetic component in the triggering mechanism, but this remains to be confirmed.<sup>10</sup> The inflammatory process triggers release of neuropeptides including substance P and calcitonin gene-related peptide (CGRP), adenosine triphosphate (ATP), neurotrophic factor, cytokines, and reactive oxygen scavengers in peripheral nerve terminals, creating a 'chemical soup' that is poorly responsive to NSAIDs.<sup>13,14</sup> Once peripheral sensitisation mechanisms are set in motion, this in turn activates central sensitisation within the dorsal horn of spinal cord and brain. The net result is sensitisation of the entire nervous system and possible suppression of inhibitory pathways at various levels. These central changes contribute to CRPS features including mechanical and temperature-related allodynia, hyperalgesia, stimulus-induced pain and spread to other anatomical sites outside of the injured zone.<sup>8</sup>

Marinus et al<sup>15</sup> summarised the myriad physiological responses seen in CRPS as an 'aberrant host response to tissue injury with (neurogenic) inflammation, nociceptive sensitisation, vasomotor dysfunction and maladaptive neuroplasticity'. They suggest that this response accounts for most or all of the clinical features of CRPS, and urged us to address all these factors in our treatment approaches.

In community-based studies, the incidence of CRPS is 6–20 per 100,000 population.<sup>16</sup>

### ANSWER 5

Associated with the physical findings of CRPS, there may be an accompanying altered mood. A combination of symptoms such as anxiety, depression, abnormal illness behaviour, panic attacks, maladaptive coping skills, catastrophising behaviour, fear/avoidant behaviour, poor sleep hygiene and irritable mood may be present.<sup>17,18</sup>

Previously, psychiatrists, pain medicine physicians and psychologists assumed this condition was associated with certain personality traits (eg deprived and unfortunate developmental history and socioenvironmental factors causing excessive abnormal pre-determined brain activity). We now know this is not the case; rather, the severity and prolonged duration of the pain and suffering leads to unwanted secondary problems.<sup>17</sup> Lack of an initial diagnosis, failed multiple treatment regimes, uncertain prognosis and possible perceptions of an uncertain future may have a profound influence on patients' state of mind. The end result is a pain disorder presenting as a biopsychosocial chronic complex disease process.<sup>19</sup>

### ANSWER 6

Management of CRPS requires provision of education and self-management advice, physical rehabilitation, pain relief and psychological support.

Referral to a pain specialist, preferably at a multidisciplinary pain centre, would be appropriate for Anna. In this setting she would be provided with coordinated care aiming for 'functional restoration' of her limb to enable normal foot function/activity. Contact should be made with the referral centre to prioritise commencement of the specialised treatment and avoid further delays. Pain management centres will triage acute

CRPS cases for early assessment and intervention in an attempt to reduce the extent of future pain and disability.

Treatment by a physiotherapist and an occupational therapist should commence as soon as possible. Immobility and poor circulation contribute directly to worsening of the condition, while early treatment generally reduces the risk of progression towards disabling, chronic CRPS. Common treatments include desensitisation procedures, mirror therapy, proactive physical therapy and occupational therapy to minimise disuse and further atrophy. These should be continued even if the patient develops a chronic state of CRPS.<sup>19–23</sup>

Psychological support at an early stage is essential. Anna has severe pain and disability. Her altered mood, depression, maladaptive coping, fear/avoidance, poor sleep hygiene and other emotional factors compounds her problems and she would benefit from psychological support. Weekly or twice weekly counselling, cognitive behaviour therapy (CBT), education and explanation of Anna's condition undertaken in a compassionate and positive manner, for example, in a cognitive-based small group education program with other people experiencing chronic pain, would be helpful. Professional staff at pain centres are involved in the delivery of group education and information sessions to support overall physical and psychological wellbeing, aiming towards achieving as normal a life as possible.<sup>18–20</sup>

Other considerations for Anna's CRPS syndrome include:

#### Pharmacological therapy

Although CRPS is associated with neuropathic pain,<sup>24</sup> there are few evidenced-based studies investigating CRPS treatments. Treatment, therefore, tends to be based on extrapolation of information from studies of other common neuropathic conditions, such as painful diabetic nephropathy, post-traumatic neuralgia and post-surgical neuropathic pain such as post-herpetic neuralgia.<sup>25</sup>

- **Analgesics**

Opioid analgesics tend to be less effective than non-opioids in neuropathic pain but may be useful for pain due to nociceptor stimulation (eg inflammatory conditions). Evidence suggests that dual acting analgesics such as tramadol or tapentadol may be effective; however there are restrictions on their use.<sup>25</sup>

- **Anti-inflammatory agents**

In the early, acute stage, NSAIDs may be tried for short periods.<sup>26</sup> A case has been made for use of oral steroid therapy for a few days in the acute phase, but there are no studies to support this line of therapy.<sup>25</sup>

- **Tricyclic antidepressants (TCAs)**

If simple analgesics and anti-inflammatory agents are ineffective, a small dose of a TCA may be considered (eg amitriptyline 10–25 mg at night, to a maximum dose of 75–100 mg at night). Such agents are thought to offer pain relief independently of their mood-altering effects.<sup>26</sup>

- **Pregabalin and gabapentin**

Pregabalin commenced at 75 mg daily or gabapentin commenced at 100–300 mg daily are listed on the Pharmaceutical Benefits Scheme (PBS) for treatment of refractory neuropathic pain that is

not responsive to other drugs.<sup>26</sup> These agents should be monitored for tolerance and their side effects include excessive drowsiness, cognitive impairment and disorientation.

If Anna does not respond to any of the strategies discussed above, she should be referred to a pain physician.

## CONCLUSION

You refer Anna to a pain physician, providing a detailed letter outlining the history of her pain and its management to date, and request an urgent appointment. The pain physician, physiotherapist, occupational therapist and clinical psychologist assessed Anna at a multidisciplinary pain centre. An appropriate pain management plan was instituted following discussion of Anna's case.

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**CASE 5**

**RUPERT IS STILL SORE AFTER HERNIA REPAIR**

Rupert, 65 years of age, underwent a right inguinal hernia repair 3 months ago. Since his surgery he has been experiencing troublesome pain localised to the operated groin. He attends your clinic at the urging of his wife, who is concerned that the pain has not subsided. Correspondence from the surgeon indicates that Rupert underwent an uncomplicated open hernia repair with reinforcement of the posterior wall of the inguinal canal with a synthetic mesh. Rupert admits that the discomfort has had a negative impact on his lifestyle. He retired recently and has become a zealous golfer but the post-surgical inguinal pain troubles him enormously and he has not been able to return to playing golf.

**QUESTION 1** 

What would you assess on examination? What investigations would you consider?

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**QUESTION 2** 

How is chronic post-surgical pain (CPSP) defined?

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**QUESTION 3** 

How common is chronic post-operative inguinal pain (CPIP)? What are the causative factors?

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**QUESTION 4** 

What conservative treatment strategies might be of benefit? What specific pharmacological treatments may be useful?

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**QUESTION 5** 

Are topical treatments useful in CPIP?

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These risk factors include:<sup>13</sup>

- **Pre-operative factors**
  - Moderate–severe pain lasting longer than 1 month
  - Repeat surgery
  - Psychological factors (eg lack of resilience, passive coping, catastrophising)
  - Pre-operative anxiety
  - Female gender
  - Younger age
  - Workers' compensation
  - Genetic and environmental components
  - Inefficient diffuse noxious inhibitory control
- **Intra-operative factors**
  - Surgical procedures with risk of nerve damage
- **Post-operative factors**
  - Acute, moderate–severe pain
  - Radiation to area
  - Use of neurotoxic chemotherapy
  - Psychological factors
  - Anxiety.

With regard to CPIP specifically, causative factors may also include hernia recurrence, meshoma, inguinal nerve injury or entrapment.<sup>3</sup> Pain patterns may be neuropathic or nociceptive and have a somatic or visceral distribution.<sup>9</sup> Neuropathic pain is thought to arise following injury to one of the inguinal nerves.<sup>14</sup> The resultant pain is perceived in the sensory distribution of the affected nerve(s). The inguinal nerves that are commonly involved are the iliohypogastric nerve, ilioinguinal nerve and the genital branch of the genitofemoral nerve.<sup>15</sup> Less frequently, the femoral branch of the genitofemoral nerve and the lateral cutaneous nerve of the thigh can be involved.<sup>16,17</sup> These nerves can become damaged intraoperatively by surgical manipulation or become entrapped in suture or fixation material.<sup>14</sup> Nerve injury or compression results in myelin degeneration, nerve oedema, fibrosis and axonal loss. Post-operatively, a nerve lesion can arise as a result of envelopment within a meshoma, irritation from excessive inflammation and fibrotic reaction, or from neuroma formation.<sup>18</sup> Causes of nociceptive pain include hernia recurrence, meshoma formation and persistent inflammation around the mesh repair.<sup>15</sup> In some cases, pain and discomfort can arise from the bulk effect of the mesh itself.<sup>19</sup> Visceral pain can arise from mesh adhesion to the nearby small bowel, or from involvement of the spermatic cord. As there is usually an overlap of neuropathic and nociceptive pain, it is frequently difficult to appreciate a discrete distinction between the two patterns.<sup>20</sup> With time, the picture may become complicated by a component of central and/or peripheral sensitisation to the pain.<sup>21</sup> Furthermore, it is well recognised that psychosocial factors play a significant role in the development of chronic pain and the nature and severity of the disability associated with it.<sup>22,23</sup>

#### ANSWER 4

Treatment of the patient with CPIP remains a challenge. In addition to neuropathic and nociceptive components, the pain is frequently influenced by emotional, social and behavioural factors. Accordingly, a multimodal multidisciplinary approach is necessary.<sup>3</sup>

Conservative treatment modalities should include an explanation as to the aetiology of the pain and reassurance that milder, less bothersome pain generally improves. More information is being given to patients pre-operatively so that they are aware of what to expect. Conservative strategies include simple analgesics, such as paracetamol and non-steroidal anti-inflammatory agents (NSAIDs), neuropathic pain medications as single agents or in combination, physical therapy and behavioural therapy.<sup>3</sup>

Inflammatory nociceptive pain responds well to NSAIDs. Neuropathic pain resulting from nerve damage caused by local inflammatory processes may also respond to NSAIDs.<sup>9</sup> Although NSAIDs are effective as analgesics, continued long-term use is generally not sustainable because of possible adverse effects.<sup>24</sup>

The anticonvulsants gabapentin and pregabalin, tricyclic antidepressants (TCAs), serotonin/noradrenaline reuptake inhibitors (SNRI) and topical lignocaine (generally used as a 5% patch) are all considered first-line treatments for neuropathic pain.<sup>25,26</sup> However, not all of these drugs are readily available on the Pharmaceutical Benefits Scheme (PBS). For example, gabapentin is PBS-listed for treatment of refractory neuropathic pain not controlled by other drugs, while the SNRI duloxetine, which is indicated for painful diabetic peripheral neuropathy (PDPN),<sup>27</sup> is only available on the PBS for major depressive disorders, and lignocaine 5% patches are not available on the PBS. Although most available trials have investigated treatment of neuropathic pain in the context of post-herpetic neuralgia (PHN) or PDPN, it is reasonable to extrapolate the results for other neuropathic pain conditions.<sup>26</sup>

Opioids have traditionally been considered a second-line treatment, as side effects and concerns regarding long-term tolerance (including opioid-induced hyperalgesia, immune suppression, endocrine deficiencies, dependence, addiction and overdose) limit long-term use.<sup>28</sup> Opioid therapy in the management of chronic non-cancer pain is increasingly contentious. A recent Australian guideline published in May 2014 stated that opioid therapy should not be initiated for the management of chronic non-cancer pain, given current medical evidence for opioid efficacy and safety.<sup>29,30</sup> Evidence-based indications are acute pain, cancer pain, palliative care and opioid dependence/addiction.<sup>29,30</sup>

Where there is refractory neuropathic pain, referral to a pain specialist and combination therapy is often needed.<sup>26</sup>

#### ANSWER 5

Although it is reasonable to attempt a trial of topical medications, given that the pain is localised to a discrete area, the drug may not be absorbed deeply enough to be efficacious in treating the underlying condition. The efficacy of topical lignocaine has been established in other conditions and lignocaine patches are generally considered safe

as systemic absorption is low.<sup>28</sup> However, a well-designed but small crossover trial of lignocaine patches (5%) in patients with severe CPIP failed to show benefit.<sup>31</sup> Capsaicin patches are emerging as a therapeutic option in neuropathic pain but are not approved or available for use in Australia.<sup>29</sup> Application of capsaicin is used to desensitise sensory axons and thereby prevent transmission of pain. However, a recent randomised placebo-controlled trial investigating capsaicin (8%) patches in the treatment of severe CPIP failed to show significant differences in pain relief between capsaicin and placebo treatment.<sup>32</sup>

### ANSWER 6

Non-surgical interventional treatments useful in CPIP include nerve blocks, pulsed radiofrequency (PRF) and cryoablation.

Nerve block of the ilioinguinal nerves is useful for diagnostic and therapeutic purposes in the diagnosis and treatment of CPIP and some evidence suggests it can provide effective, sustained pain relief.<sup>33</sup> If a nerve block results in pain relief but the analgesia is not sustained, PRF or cryoablation may be considered for longer-lasting analgesia.

PRF is an interventional technology used in chronic pain management and involves administering high-intensity current in short pulses to nerve tissue. Heat is allowed to dissipate in the latent phase so neurodestructive temperatures are not attained (typically, the probe heats to 42°C). The mechanism by which PRF provides pain relief is not fully understood but it is thought to attenuate conduction of impulses in pain fibres. Accordingly, PRF is a safe treatment modality and has clinical applications in neuropathic pain. PRF has been reported as a successful treatment modality in multiple case series as well as in recent systematic reviews.<sup>34–36</sup> It has been applied peripherally to the inguinal nerves and also to the nerve roots that give rise to the inguinal nerves (T12–L2).

Cryoablation is a neurodestructive technique that selectively destroys axons and myelin sheaths while leaving epineurium and perineurium intact and hence neuroma formation is unlikely. This treatment can result in prolonged pain relief without risk of deafferentation pain and has been reported as a successful mode of analgesia for patients with CPIP.<sup>37</sup>

Neuromodulation has been used successfully in patients with CPIP with pain refractory to pharmacological and other treatment modalities. Peripheral nerve field stimulation (PNFS), and spinal cord stimulation (SCS) are neuromodulation techniques that use implantable devices to produce pain relief by providing gentle paraesthesias in the concordant areas of pain. Multiple case reports and case series of neuromodulation use in CPIP have been published showing successful results; however, patient selection is crucial for the success of these modalities.<sup>38–42</sup> Dorsal root ganglion stimulation is an emerging neuromodulation technique that offers some advantages over traditional SCS. Early data suggest it may represent an effective treatment for chronic neuropathic pain conditions in the groin region.<sup>43</sup>

### ANSWER 7

The majority of patients can be managed using conservative measures. However, surgical management can be considered for patients whose pain is refractory to conservative measures, if there is a structural or anatomical target that may be corrected surgically with a reasonable expectation that this will improve the pain.<sup>3</sup> Remedial operations should be performed by experienced hernia surgeons.

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**PAIN MANAGEMENT (ACTIVITY ID: 19111)**

This unit of check is approved for 6 Category 2 points in the RACGP QI&CPD program. The expected time to complete this activity is 3 hours and consists of:

- reading and completing the questions for each case study
- you can do this on hard copy or by logging on to the gplearning website, <http://gplearning.racgp.org.au>
- answering the following multiple choice questions (MCQs) by logging on to the gplearning website, <http://gplearning.racgp.org.au>
- you must score  $\geq 80\%$  before you can mark the activity as 'Complete'
- completing the online evaluation form.

You can only qualify for QI&CPD points by completing the MCQs online; we cannot process hard copy answers.

If you have any technical issues accessing this activity online, please contact the gplearning helpdesk on 1800 284 789.

If you are not an RACGP member and would like to access the check program, please contact the *gplearning* helpdesk on 1800 284 789 to purchase access to the program.

**CASE 1 – JOSEPHINE**

Josephine, a cleaner aged 59 years, fell and hurt her back at work a year ago. She has come to see you for the first time to discuss her ongoing back pain. At the time of her fall, imaging did not show significant findings and her GP prescribed simple analgesics for her pain. A second GP referred her for physiotherapy, which was not useful. Examination today does not reveal any identifiable underlying problems.

**QUESTION 1**

Are there any red or yellow flags in this presentation?

- Doctor shopping is a possible yellow flag in this case.
- There are several red flags in this presentation.
- Worker's compensation claim is a yellow flag in this case.
- Answers A and B are correct.
- Answers A and C are correct.

**FURTHER INFORMATION**

Josephine's current medications include paracetamol up to 4 g daily, tramadol 200 mg twice daily and oxycodone CR 80 mg twice daily. Occasionally, she takes temazepam 10 mg at night to help her sleep.

**QUESTION 2**

Which of the following statements is correct with regards to opioid use in chronic pain?

- Opioids are useful adjunct analgesics in the setting of any chronic pain.
- Hunter Integrated Pain Service (HIPS) guidelines endorse opioid use in chronic non-cancer pain.
- Current indications for opioids include chronic non-cancer pain (CNCP).
- HIPS states that people using opioids for CNCP should be slowly weaned off them.
- According to HIPS, opioid dependence/addiction is not an evidence-based indication for opioid therapy.

**CASE 2 – ANNE**

Anne, aged 33 years, presents with a 12–18-month history of tiredness, persistent aches and pains in her arms and neck, and difficulty sleeping. She finds it difficult to continue her usual activities and is not coping at work or at home. Examination reveals extensive musculoskeletal tenderness, which you think is suggestive of fibromyalgia.

**QUESTION 3**

Which of the following correctly describes appropriate assessments and/or investigations for Anne?

- A comprehensive general examination is not required in the assessment of fibromyalgia.
- A full blood evaluation (FBE), erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) should be considered.
- Liver function and a thyroid function tests should be considered.
- Answers B and C are correct only.
- Answers A, B and C are correct.

**FURTHER INFORMATION**

Fibromyalgia is confirmed using the American College of Rheumatology's diagnostic criteria. You and Anne develop a multidisciplinary patient management plan to manage her fibromyalgia.

**QUESTION 4**

Which answer is correct with regards to the management of fibromyalgia?

- Simple analgesics (eg paracetamol) and anti-inflammatory agents have a role in the management of fibromyalgia.
- At present, there are no medications approved for fibromyalgia.
- Selective serotonin reuptake inhibitors (SSRIs) have some benefit for fibromyalgia pain.
- A fibromyalgia plan consists of two components.
- Topical analgesics are recommended in fibromyalgia.

**CASE 3 – JANE**

Jane, 19 years of age, presents for the first time with a 1-year history of abdominal pain. She has seen several GPs who, after examining and investigating her, have advised that there is no underlying explanation for her pain.

**QUESTION 5**

Which answer correctly outlines possible causes of Jane's pain?

- A. Endometriosis
- B. Fibromyalgia
- C. Abdominal migraines
- D. *Herpes zoster* infection
- E. Answers A–D are correct.

**CASE 4 – ANDREW**

Andrew, aged 67 years, visits for the third time as he is concerned about ongoing pain, swelling and mottled skin arising from a recent ankle injury. Examination and investigations undertaken at his first visit revealed normal findings. Today he advises that the pain is ongoing. His right foot often changes colour and he can no longer wear closed shoes. You suspect a diagnosis of complex regional pain syndrome (CRPS).

**QUESTION 6**

Which of the following options is correct regarding confirmation of this diagnosis?

- A. Magnetic resonance imaging (MRI) data are required to confirm the diagnosis of CRPS.
- B. MRI and thermography data are required to confirm the diagnosis of CRPS.
- C. There are no specific investigations that can be used confirm CRPS presently.
- D. A bone scintigram is required to confirm the diagnosis of CRPS.
- E. Thermography data is required to confirm the diagnosis of CRPS.

**FURTHER INFORMATON**

Using clinical diagnostic criteria and with the support of MRI and thermography data you confirm a diagnosis of CRPS.

**QUESTION 7**

Which of the following options is the most correct with regards to management of CRPS?

- A. Management of CRPS is best undertaken in the general practice setting.
- B. There is strong evidence to support the use of pharmacological therapy for CRPS.
- C. There is no urgency with regards to referral for physiotherapy or occupation therapy.

- D. Andrew does not require assessment for a possible mood disorder (eg depression).
- E. Management requires patient education, self-management advice, rehabilitation, pain relief and psychological support.

**CASE 5 – JOHN**

John, 69 years of age, comes to see you about ongoing pain following left inguinal hernia repair surgery 5 months ago. After several visits you have concluded that he has developed post-surgical pain syndrome.

**QUESTION 8**

Which statement is correct regarding the diagnosis of chronic post-surgical pain (CPSP) and/or chronic post-herniorrhaphy inguinal pain (CPIP)?

- A. Mesh infection is not a likely contributor to CPIP and does not require routine consideration.
- B. A diagnosis of post-surgical pain requires thermography data showing temperature variations between areas of pain and those without pain.
- C. For a diagnosis of CPIP, 3–6 months of ongoing chronic pain is required and other causes of pain must be excluded.
- D. The diagnosis of CPIP requires pain to have been present for at least 2 months and other possible causes of pain excluded.
- E. Non-surgical interventions such as nerve block, pulsed radiofrequency and ablation are not useful when conservative pain management fails in CPIP.







PBS Information: Restricted benefit. Chronic severe disabling pain not responding to non-narcotic analgesics. Authority required for increased maximum quantities and/or repeats. Refer to PBS schedule for full restricted benefit and authority information.

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