Pain and You
by the Pain Association of Singapore and its Advisory Board
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Dr Ho King Hee received his undergraduate education from the National University of Singapore (NUS). After graduation, he worked as a lecturer in the Department of Medicine until 2001. He then moved to private practice, working as a Consultant Neurologist at Gleneagles Medical Centre, Singapore. Although his formal postgraduate training is in clinical neurophysiology, he has a special interest in headache and pain. Dr Ho has done most of the epidemiological research in headache in Singapore and has served as a contributor/co-editor for the relevant MOH Practice Guidelines. He is Founder President of the Headache Society of Singapore.

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Introduction

There are many definitions of pain but ultimately, many physicians will agree that pain is when the patient says it hurts. During the first 2004 'Global Day Against Pain', the International Association for the Study of Pain (IASP) declared that 'The Relief of Pain should be a Human Right'. To date, it is estimated that one in five people suffer from moderate to severe chronic pain, and that one in three are unable or less able to maintain an independent lifestyle due to their pain. It is therefore the responsibility of physicians to work closely with their patients to help alleviate acute and chronic pain.

Welcome message

Following the successful launch of the first newsletter of the Pain Association of Singapore (PAS) and its advisory board, there has been much positive feedback from many members of the association and other health care professionals. These newsletters are meant to be a link between the association, its advisory board and the many health care professionals who are involved in the day to day management of pain.

In this issue, we have again brought together very topical issues, like the use of opioids in chronic noncancer pain, which has been seen largely as a double-edged sword in our medical management of patients. A brief discussion of its controversies is presented. Another very useful reference relating to this topic is the Clinical Practice Guidelines (CPG) to be issued by the Ministry of Health (MOH). Also in this newsletter are discussions of irritable bowel disease and syndrome, surgical management of pain and the management of facial pain and headaches, all by experts in their fields.

We certainly welcome any feedback from our readers and would like to encourage interaction between our readers and members, with the aim of enhancing our knowledge and skills in the management of pain.

In the next newsletter, I hope to highlight the latest updates of the 11th IASP World Congress of Pain held in Sydney on 22–26 August, so stay with us in this series of newsletters.

We would also like to welcome three new members who have joined the PAS Advisory Board. They are: Dr Khoo Kei Siong, Consultant Oncologist, Dr Richard Guan and Dr Gwee Kok Ann, both Consultant Gastroenterologists.

Dr Yeo Sow Nam
President, PAS

Opioids for pain management: the myths and controversies

Dr Yeo Sow Nam

Analgesia and the pain pathway

There are various receptor sites along the pain pathway at which analgesics exert their activity (Figure 1).[1] Analgesics can be divided into two major categories – opioids and nonopioids (cyclooxygenase-2-selective inhibitors [coxibs] and nonselective nonsteroidal anti-inflammatory drugs [NSAIDs]). Evidence suggests that NSAIDS and coxibs act predominantly on peripheral receptors while opioids act predominantly on central receptors.[1] However, both coxibs and nonselective NSAIDS have been shown to increase the risk of acute myocardial infarction in patients with arthritis, causing sufficient concern to warrant reconsideration of the cardiovascular safety of NSAIDs and coxibs.[2]

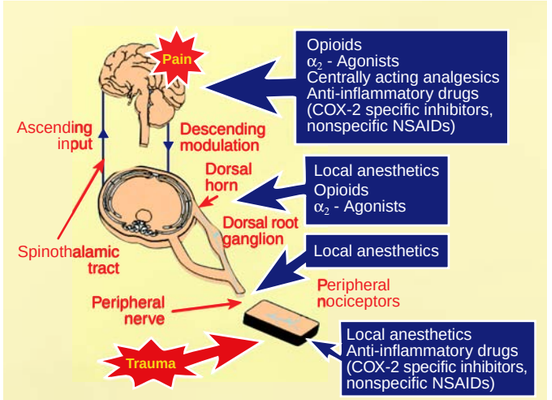

Figure 1. Analgesia and the pain pathway
Adapted from reference 1

Opioids and chronic noncancer/nonmalignant pain

The use of opioid analgesics for chronic noncancer/nonmalignant pain is controversial, although the analgesic effect of opioids – in the form of opium – has been known for thousands of years. Evidence shows that opioids confer analgesic benefit with a low risk of addiction when used for short periods by patients suffering from noncancer pain, but that they are unlikely to yield psychological or functional improvement.[3] Many clinical outcomes studies have shown opioids to be effective in the short-term treatment of pain due to osteoarthritis,[4-6] and in mixed musculoskeletal pain syndromes. The usefulness of opioids in improving mood and functional status, as well as reducing pain intensity, has been reported.[7-9]

"Tolerance is a normal physiological phenomenon in which increasing doses are required to produce the same effect."

Tolerance, physical dependence and the risk of addiction

The use of opioids for noncancer pain should be individualized accordingly, as there may be long-term side effects such as cognitive dysfunction, hormonal suppression, immune suppression, tolerance, opioid induced hypersensitivity and addiction. Most physicians believe that using opioids on a chronic basis is intrinsically bad and also fear incurring problems with their state licensing board. In addition, there is scope for patients to abuse opioids.

"Physical dependence is a normal physiological phenomenon in which a withdrawal syndrome occurs when an opioid is abruptly discontinued or an opioid antagonist is administered."

According to the Oxford Textbook of Palliative Medicine and the consensus statement from the Liaison Committee on Pain and Addiction (LCPA), there are distinct differences between tolerance, physical dependence and psychological dependence/addiction (Figure 2).[10,11] Nevertheless, the risk of opioid addiction in pain patients without past history of addiction is low. In patients suffering from substance addiction, including alcohol, the reported risks were 5% to 16%.[12] Hence, physicians should screen prospective patients carefully, for past history of substance abuse, alcoholism and family history of substance abuse.

According to the Liaison Committee on Pain and Addiction (LCPA)'s consensus statement, 1999, the four "C"s of addiction are:

- Impaired **Control** over drug use
- **Compulsive** use
- Continued use despite harm (adverse **Consequences**)
- **Craving**

Figure 2. LCPA's definition of drug addiction
Adapted from reference 11

Patient and physician selections for opioid use

There is a lack of studies on long-term opioid therapy for chronic noncancer pain. Physicians are therefore advised that patients should be thoroughly evaluated, including on their psychological stability. It is critical for physicians to determine if the cause of the pain is nociceptive or neuropathic.[13-15] An agreement must be reached between patient and doctor on how to assess the outcome of therapy before start of therapy. Wherever possible, the prescription of opioids to a given patient should be the responsibility of only one doctor. Ideally, suitable patients should be assessed by a specialist pain management centre which will communicate with the prescribing doctor.[12-15]

Short-Acting Opioids	Long-Acting Opioids
■ Hydrocodone	■ Transdermal Fentanyl
■ Hydromorphone	■ Methadone
■ Morphine	■ Extended-release morphine
■ Oxycodone	■ Oxycodone CR
■ Oral transmucosal fentanyl	
■ Tramadol	

Figure 3. Short- and long-acting opioids

Opioid drugs selection and therapy

The choices available for short- and long-acting opioids are shown in Figure 3. Morphine is the drug of choice but methadone and oxycodone are useful alternatives. In general, intramuscular opioids should not be used to treat chronic noncancer pain. In particular, intramuscular pethidine should be avoided. Pethidine has a short half-life, possibly an increased risk of dependence due to its psychomimetic effects, and the potential for excitatory central nervous system effects after repeated doses. Physicians should provide dietary advice to minimize constipation and laxatives should be considered.[14] The prescription principles before and after prescribing opioids on a long-term basis are summarized in Figure 4. Potential consequences of opioid therapy should be advised, and a written consent form will be valuable particularly when treating difficult patients.[16]

In summary, evidence shows that a small group of patients can benefit from opioid therapy for noncancer chronic pain. Thorough diagnosis and patient history are essential prerequisites to successful treatment.

- **Trial of oral opioid**
  - Over 4-6 weeks with predetermined goals and endpoints
  - Round the clock
  - Patient's responsibility of ensuring adequate supplies
  - Dose tapered and ceased if expected outcomes not achieved
- **Ongoing reviews**
  - Weekly, monthly and yearly by Pain Management Centre
  - Analgesic efficacy, functional improvements
  - Aberrant behaviours

Figure 4. The prescription principle for opioids
Adapted from reference 14

Headache and facial pain

Dr Ho King Hee

Making a practical/treatable diagnosis

Pain in the head can be divided into headache or facial pain.[17] Headaches comprise primary and secondary headache, while facial pain can be divided into cranial neuralgias, central causes of facial pain and other causes which cannot be clearly defined. Headache is conventionally distinguished from facial pain when the face is spared. In practice, anatomical overlap of these two entities may be present; for example, pain in the temple can be due to migraine, herpes zoster or giant cell arthritis. Physicians therefore need to consider the possibility of various differential diagnoses.

Diagnosis of headache

Accurate diagnosis of headache is important because it enables effective treatment, relieves patient anxiety and improves patients' confidence in their physicians. Furthermore, accurate diagnosis can be used as a basis for patient self-education and self-management. Some of the more common forms of headache include migraine with and without aura, cluster headache, tension-type headache, and cervicogenic headache. In 1988, the International Headache Society (IHS) published the criteria for the diagnosis of a number of different headache types.[18] These criteria have recently been revised.[19] Distinct characteristics of migraine include photophobia, phonophobia and vomiting (Figure 5). In 'classical' migraine, prodromal symptoms (an 'aura') precedes the headache but may also occur without pain. These symptoms generally involve focal neurological deficit lasting one hour or less before headache onset, and may include visual disturbance, vertigo, speech difficulty, and hemisensory disturbance. Cluster headaches and chronic paroxysmal hemicrania are distinct

	Migraine	Tension headache
Duration	4-72 hours	Any
2/4 of:		
Severity	Moderate to severe	Mild to moderate
Location	Unilateral	Bilateral/generalized
Relationship to exertion	Worse	No difference or improved
Nature	Throbbing with pulse	Tight, non-throbbing
1/2 of:		
Nausea or vomiting	Present	Absent
Photophobia and phonophobia	Present	Absent

Figure 5. IHS criteria for migraine and tension headache

primary headaches that share common features of unilaterality, intensity, location, autonomic phenomena and temporal pattern. Other miscellaneous primary headaches include idiopathic stabbing headache, sinus headache, external compression headache, cough headache, exertional headache, 'ice cream' (cold stimulus) headache, and coital headaches.

Diagnosis of common facial pain

Facial pains are commonly due to trigeminal neuralgia, herpes zoster, glossopharyngeal neuralgia, occipital neuralgia or atypical facial pain. Also known as tic douloureux, trigeminal neuralgia is characterized by stabbing pains, often accompanied by a brief facial spasm or tic. The pain distribution is 97% unilateral and follows the sensory distribution of cranial nerve V. Moreover, the pain is characteristically severe, paroxysmal, and lancinating. Patients are careful to avoid trigger zones, or areas of increased sensitivity which cause the pain to occur. Facial sensory loss does not generally occur. A typical facial pain is characterized by deep burning, aching, dull or crushing pain. The pain distribution can be either unilateral or bilateral. Sensory deficits may or may not occur. Some of the red flags or danger signs with patients suffering headaches are listed in Figure 6.

Neuroimaging and pain management

Obtaining a good history is of paramount importance when managing patients suffering from headache. Physical examination should include neurological examination, fundoscopy, palpation for trigger points and assessment of neck movements. If the headache is unusual, there are 'red flags', the patient is anxious, or refractoriness to therapy are present, neuroimaging is recommended. The probability of successful treatment increases with use of a broad range of symptom-treating drugs (Table 1), daily prophylactic treatment and adoption of a multidisciplinary approach.[20] Prophylaxis is indicated for patients suffering from frequent, very long-lasting or troublesome headaches. Adjuvant treatments such as myofascial therapy and trigger point injections can be applied in cases of resistant headache.

- Recent onset, unremitting
- > 50 years old
- Fever
- Focal neurological deficit
- Seizures
- No side alternation
- "Worst headache of my life"
- Woken up with sudden headache
- Worse with bending over
- Worse in the morning, with nausea or vomiting
- Loss of cognitive ability or personality

Figure 6. Some of the danger signs of headaches

Table 1: Medications with level 1 evidence of efficacy in headache treatment and prophylaxis

Category	Drug Name (Generic)	Dosage and Frequency
Medications with level I evidence of efficacy in acute migraine treatment		
Simple analgesics	Aspirin Paracetamol Paracetamol/Codeine	650–1300 mg q4h x 2 1 g q6h x 4 400 mg/25 mg x 2
NSAIDs	Naproxen Mefenamic acid Ketorolac	275–550 mg q6h x 2 250–500 mg q6h x 2 30 mg q6h x 2
Antiemetics	Metoclopramide Procholorperazine	10 mg x 1 10–12.5 mg x 1
Nonselective 5-HT_1 agonists	Ergotamine	1 2 mg q1h x 3
Selective 5-HT_1 agonists (triptans)	Naratriptan Sumatriptan Zolmitriptan Eletriptan	2.5 mg q2h x 2 50–100 mg q2h x 2 2.5 mg q2h x 2 40 mg q2h x 2
Medications with level I evidence of efficacy in acute tension headache treatment		
Paracetamol and combinations	Paracetamol Paracetamol/Caffeine Paracetamol/Codeine	1 g qds/prn 1 g / 130 mg tds/prn 1 g / 16 mg tds/prn
NSAIDs	Ketoprofen Ibuprofen Naproxen	25–50 mg tds/prn 200–400 mg tds/prn 275–550 mg bd/prn
Medications with level I evidence of efficacy in migraine prophylaxis		
β-blockers	Atenolol Timolol Propranolol	50–100 mg om 50–100 mg bd 20–60 mg bd-tds
Ca^{2+} channel blockers	Flunarizine Verapamil	5–10 mg on 80 mg on
Serotonin antagonists	Pizotifen	0.5–2 mg tds
Antidepressants	Amitriptyline Venlafaxine	10–50 mg on 75–150 mg om
Anti-convulsants	Valproate	200–600 mg od-bd
Vitamins	Riboflavin	400 mg bd
NSAIDs	Naproxen	550 mg bd
Medications with level I evidence of efficacy in tension headache prophylaxis		
Antidepressants	Amitriptyline Clomipramine Mianserin Moclobemide	10 – 50 mg on 25–100 mg on 30–60 mg on 150–300 mg om
Anxiolytics	Buspirone Alprazolam	5 – 20 mg tds 0.25–0.5 mg on
Selective serotonin reuptake inhibitors	Fluoxetine Fluvoxamine Paroxetine	20 mg/day 50–100 mg/day 10–50 mg/day

Surgical options for pain management

A/Prof London Lucien Ooi

Palliation

Palliation is defined as the control of symptoms that a disease may cause, with the aim of improving quality of life and enabling patients to continue normal activities of daily living (ADL). However, physicians often neglect the control of symptoms as an integral part of patient care, instead focusing on treatment of the underlying disease. In particular, palliation of cancer patients is often mistaken as terminal care in hopeless situations, associated with the use of medications only.

Physicians should consider palliation right from the beginning of management or treatment. Pharmacotherapy is not the only therapy available for pain management. Surgery, chemotherapy, physiotherapy and massage therapy also have a place in pain control. Some concepts and considerations for physicians when choosing palliative care options are summarized in Figure 7.

- Do no (more) harm
- Improve quality of remaining life
- Non-invasive before invasive
  - Which is more effective?
  - Which has shorter period of morbidity?
- Step-ladder progression of control
- Is there time?

Figure 7. Palliation concepts and considerations

Pain in tumours

Pain is the most common and perhaps most feared symptom in advanced cancer patients. 30–40% of patients with cancer pain reported suffering moderate to severe pain at diagnosis. In patients with advanced cancer, 60–100% will experience pain at some time of their disease. The hopelessness of uncontrolled pain can result in cancer patients looking forward to death or considering suicide. Some of the more common reasons for pain caused by tumours are summarized in Figure 8. Cancers that cause pain are most commonly from tumours in the bone, pancreas and oesophagus. More than 80% of patients with these diagnoses will experience pain at some point during their illness.[21]

- Tumour size - distension, ischaemia
- Bleeding - intra-tumoral or external
- Tumour rupture
- Tissue destruction e.g. bone
- Invasion of innervated structures
- Impediment of normal luminal flow

Figure 8. Common causes of pain in tumours

Management of tumour pain has traditionally been addressed by analgesics in a stepwise ladder-progression fashion. A newer concept involves the use of regional blocks. In addition, it is important that physicians identify and address the specific cause of cancer-associated pain. For example, cancer pain is frequently mechanical, and the best solution in this case may be to remove the source of pain through surgery rather than to block the pain perception and not address the cause.

Surgery for pain control

Surgery is in fact not a well-accepted option for pain control. Many physicians prefer, what they believe to be, other more effective options as opposed to an invasive process with the associated risks of morbidity and mortality. Additionally, patients may find the costs and emotional fear associated with surgery to be an issue.

Nevertheless, surgery offers almost immediate results for some patients' pain. For these patients, the solution through surgery is permanent and the risk of morbidity and mortality is reasonable. Short-term side effects and transient limitations of ADL are the main problems with surgery, which should not affect long-term results. Some of the advantages of surgery as an option for pain control are summarized in Figure 9.

- Remove tumour
- Stent a luminal blockade
- Restore function/mobility
- Bypass a luminal blockade
- Create stability
- Stop bleeding

Figure 9. What surgery can do for pain control

The important concepts when considering surgery for pain control are:

(1) surgery need not be the last resort after all else has failed;
(2) surgery need not be radical but may be major;
(3) surgery should always be considered as an option to meet individual patients' needs;
(4) outcomes of surgery (morbidity and mortality of the procedure) must be good; and
(5) most importantly, surgery must cause no more harm.

Physicians should note that while medical therapy, because of the stepwise progression, provides the patient with short-term 'restraint' in the face of long-term 'pain', surgical therapy, where appropriate, offers the patient short-term 'pain' with long term 'gain'.

In summary, palliation by surgery for pain control is often neglected and pain management should not be seen solely to be the domain of palliative-medicine physicians. Surgery has a place in the management of cancer pain when appropriately applied to the individual patient.

Chronic visceral abdominal pain: insights into irritable bowel syndrome and inflammatory bowel disease

Dr Ooi Choon Jin

Irritable bowel syndrome and inflammatory bowel disease

Irritable bowel syndrome (IBS) is prevalent worldwide, affecting up to 20% of the global population.[22] Most patients are aged between 30 and 50 years.[23] In Western countries, women are two to three times more likely to develop IBS than men.[24] To date, IBS has been viewed as a biopsychosocial disorder resulting from an interaction between increased visceral hypersensitivity, altered gut motility and psychological factors. The Rome and Manning criteria are two useful guidelines to assist physicians in identifying IBS patients.

There are two kinds of inflammatory bowel disease (IBD) – Crohn's disease (CD) and ulcerative colitis (UC). The prevalence of CD and UC is much lower than IBS but the age of onset is similar. UC is characterized by diffuse mucosal inflammation and ulceration of the rectum and colon in a continuous fashion. CD manifests as patchy, transmural inflammation which can affect any part of the gastrointestinal tract, i.e. from mouth to anus. The aetiology of IBD is unclear but is presumed to occur through a combination of genetic and environmental factors (Figure 10).[25-27]

Pain in irritable bowel syndrome

IBS has protean manifestations but is typically characterized by abdominal pain, bloating and disturbed defecation. The pain is frequently diffuse without radiation and common sites include the lower abdomen – specifically the left lower quadrant. Acute episodes of sharp pain are often superimposed on a more constant dull ache. Meals may precipitate pain, and defecation commonly relieves pain.

An enhanced perception of normal motility and visceral pain characterizes IBS. It has been demonstrated that both awareness and pain caused by balloon distension in the large and small bowel are experienced at significantly lower balloon volumes in patients with IBS than in healthy subjects. Patients who are affected describe widened dermatomal distributions of referred pain.

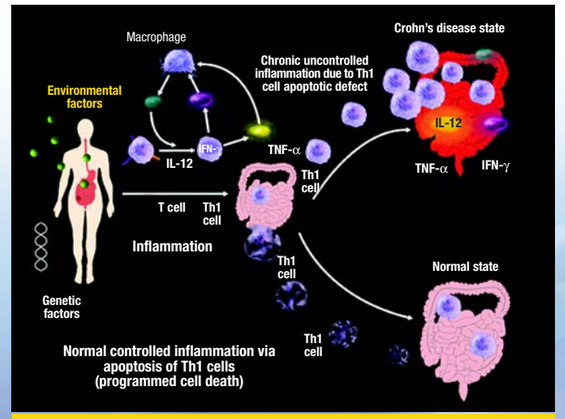

Figure 10. The aetiology of Crohn's disease
Adapted from reference 26

Pain in inflammatory bowel disease

IBD is frequently associated with the presence of both acute and chronic pain which may be visceral or somatic in nature. Visceral pain – or pain of the deep organs – is characterized by being poorly localized. It is usually described as being very intense. In contrast, the somatic pain – or pain of the soft tissues (muscles, etc) – is more localized, and is described as sharp, stinging or precise. Visceral pain is more complex than somatic pain, and is very sensitive to inflammation, stretching and intense contractions.

Inflammatory bowel disease patients with irritable bowel syndrome

As many as one third of IBD patients have IBS and most physicians feel that it is a biopsychosocial disease. Hence, treating the pain, but not targeting the emotional and psychological aspects, does not represent complete disease management.

Diagnosis of CD can be aided through the use of capsule endoscopy which is basically a camera in a pill. The pill is swallowed and as it travels through the gastrointestinal tract, it can acquire up to 55,000 digital images in the process.

Treatment for irritable bowel syndrome pain

There is no cure yet for IBS, but many options exist to treat the symptoms. Recent data suggest that serotonin, a neurotransmitter found in the brain and gut, may be related to the pathophysiology of IBS. A serotonin agonist has been reported to be effective in female constipation-predominant IBS patients. The treatment goal of IBS, however, is to provide global relief of the multiple symptoms associated with the disorder and a treatment targeting a single IBS symptom is suboptimal (Figures 11 and 12).

- Anti spasmodics and anti cholinergics
  - Buscopan, librax, meteospasmyl, mebeverine, trimebuthine
- Tricyclic antidepressants and SSRIs
  - Amitryptyline*
  - Flouxetine (Prozac), paroxetine (Paxil)
- Antidepressants must be used on a continual basis if their effects are to be maintained, lag time before any therapeutic effect is seen can be as long as 6 weeks

Figure 11. Multiple symptom therapy for IBS pain management

- Tegaserod is a 5-HT$_4$ receptor partial agonist indicated for women with constipation predominant IBS
- Activation of the 5-HT$_4$ receptor in the GI tract, via tegaserod normalizes impaired intestinal motility, inhibits visceral sensitivity, and stimulates intestinal secretion

Figure 12. Single symptom therapy for IBS pain management

Treatment for pain in inflammatory bowel disease

The technique employed by many physicians in the treatment of acute IBS pain comprises a simple strategy, such as 'step up' or 'hit hard' and then 'step down'. Medications include Panadol/Panadeine, codeine and morphine/pethidine. For chronic pain, regular maintenance therapy and 'breakthrough' analgesia for episodes of increased pain are used. Regular use of analgesics is generally more effective than combating acute episodes with large doses. Medications for chronic pain in IBDs include Panadol, Panadeine, Anarax, codeine, antispasmodics for spasms and IBS symptoms, and antidepressants.

Case study one

The patient was a 75-year-old male suffering from persistent low back pain, which was affecting his sleep. He was prescribed an NSAID by his general practitioner. As the pain persisted, he consulted a surgeon who then ordered X-ray and blood tests. The diagnosis confirmed severe hypertrophic osteoarthritis at all the lumbar facet joints, as well as degenerative spondylolisthesis at L4-5. He was referred to a pain specialist at SGH for an epidural injection. This injection can often help to alleviate radicular symptoms. However, at the pain clinic, a detailed evaluation of his symptoms revealed nocturnal pain which frequently woke the patient. A tumour workup was then performed. The patient's blood test showed a raised PSA level indicating the possibility of prostate cancer. He had neither urinary symptoms nor loss of appetite. A bone scan confirmed bone metastasis and the patient underwent an orchidectomy. After the patient's tumour was treated by surgery, the PSA levels normalized. His low back pain was then treated with facet joint injection, which successfully alleviated his pain by more than 60%.

Lesson: Red flags for tumours, infection, neurological deficits and fracture must always be evaluated and re-evaluated at each consultation prior to any pain treatments.

Case study two

The patient was a 48-year-old male suffering from low back pain on the right hand side for the past three years. Consultation with a physiotherapist, general practitioner and orthopaedic surgeon revealed no red flags. The diagnosis was degenerative scoliosis and the patient complained of severe pain while standing or walking. The spine of the patient not only bent sideways, it also rotated horizontally. The effect of the horizontal rotation was a 'hump', at the left side of his ribs that have been rotated backward. The patient suffered a lot of pain in the contra-lateral side (right) and nerve root pain on the uni-lateral side (left). MRI showed indentation in the nerve roots at the right L4-5 and L5S1 regions. The patient underwent physiotherapy for six months but no improvement was observed. He was then prescribed Neurontin for neuropathic pain and had left nerve root treatment (via microinjections) to relieve pain in the spine.

Lesson: Treatments for pain in structural abnormalities include careful evaluation of pain mechanisms. The nerve pain in this patient was opposite to the 'MRI abnormality', which was often a red herring. MRI findings may also be over-sensitive and pick up many false-positives, as in this case. Even when surgery is not indicated and required, minimally invasive microinjections can help alleviate patients' symptoms and suffering.

Case study three

The patient was a 50-year-old male suffering from cancer of the lung who had recently undergone a pneumonectomy. He complained of very severe intractable pain on the left hip due to a pathological fracture for the last three weeks. The tumour had invaded the acetabulum as well as the proximal femur, through the pelvis. The patient was non-responsive to all opioids, radiotherapy and chemotherapy. The patient had an impending fracture round to the acetabulum, directly involving the iliacus muscle. The patient was in a fixed fraction deformity because of pain and he could not straighten his legs. He could not sleep at night and was drowsy in the day due to oral morphine usage. The goal was palliation to minimize the patient's suffering, as prognosis was less than three months and, hence, the patient was not appropriate for surgery. An intraspinal catheter connected to an automated pump was used to infuse local anaesthetic and morphine at minute doses specific to the nerve and directly to the fractured area. Following this treatment, the patient was able to straighten his leg, be transferred to a wheelchair and sleep well.

Lesson: Cancer pain is undertreated and underdiagnosed in many cases. Surgery is often not an option for patients with short-term prognosis. Advanced techniques with implantable devices offer very safe and effective pain management measures. This must involve a multidisciplinary team, including the pain specialist and pain nurse clinician, oncologist, and palliative care team, and inputs from the surgical team and radiation oncologist.

Case study four

The patient was a young female suffering from IBD with IBS. The patient was diagnosed with Crohn's disease after colonoscopy was conducted but the initial diagnosis was either IBS or IBD with depression. The patient suffered from bloating and pain, and at times, it was not possible to differentiate the symptoms of IBS from IBD. However, in terms of gastrocolic reflex, the patient with IBD would have a stricture of the terminal ileum, low-grade fever and joint pain. For IBS, the patient would feel pain and a desperate need to evacuate the bowel. The patient also suffered from premenstrual pain. However, in evaluating the patient's IBD or IBS pain, a good guide would be to conduct screening tests including serum protein, albumin, erythrocyte sedimentation rate etc. The patient also underwent psychotherapy in addition to medications, which helped.

Lesson: Pain management must encompass a biopsychosocial approach for optimal outcome.