

# NEUROPATHIC PAIN



Multidisciplinary Panel on  
Neuropathic Pain

神經痛跨學科研究小組

## PANEL MEMBERS

### Dr Chen Phoon Ping

Consultant  
Department of Anaesthesiology, Intensive Care &  
Operating Services  
Alice Ho Miu Ling Nethersole Hospital  
Honorary Clinical Associate Professor  
The Chinese University of Hong Kong

### Dr Josephine Ip

Chief of Division of Hand & Foot Surgery  
Department of Orthopaedic Surgery  
The University of Hong Kong, and  
President Elect, Hong Kong Society for  
Surgery of the Hand

### Dr Joseph MK Lam

Consultant, Division of Neurosurgery  
Prince of Wales Hospital

### Dr Lee Tsun Woon

Chief of Service  
Department of Anaesthesia & Intensive Care  
Tuen Mun Hospital

### Dr Tsoi Tak Hong

Neurologist and Consultant Physician  
Pamela Youde Nethersole Eastern Hospital

### Dr Wong Chun Por

Vice President, Hong Kong Geriatrics Society, and  
Chief of Integrated Medical Services  
Consultant and Head,  
Department of Geriatrics  
Ruttonjee & Tang Shiu Kin Hospital

### Dr Lawrence KS Wong

Professor and Chief, Division of Neurology  
Department of Medicine and Therapeutics  
Prince of Wales Hospital  
The Chinese University of Hong Kong

## CONTACT THE PANEL

Forward any comments on this  
newsletter to the Multidisciplinary  
Panel on Neuropathic Pain at  
mpnp@asia.cmpmedica.com

*Challenges in Neuropathic Pain* is a newsletter brought to you by the Multidisciplinary Panel on Neuropathic Pain (MPNP). This issue features the MPNP recommendations for neuropathic pain associated with peripheral nerve injury and a case presentation on acute cervical spine injury with associated neuropathic pain. The regular features, including a literature review, useful Web sites and a calendar of upcoming events, will keep Hong Kong clinicians abreast of the latest in neuropathic pain.

## Neuropathic Pain Associated with Peripheral Nerve Entrapment or Injury

Peripheral nerve injury can cause a variety of conditions and syndromes. The management of neuropathic pain caused by peripheral nerve injury, commonly due to trauma or nerve entrapment, differs significantly from the management of other neuropathic pain conditions. Surgery and nerve repair are more readily considered first-line treatment options rather than pharmacological treatment, particularly in severe cases. The recommendations are summarized in Table 1.

### Nerve injury at the root level

#### Cervical spondylosis

Cervical spondylosis is a degenerative disease of the cervical vertebrae, intervertebral discs and surrounding ligaments, and ageing is its major risk factor. However, it may also develop in people with a previous neck injury.

#### Diagnosis

Symptoms of cervical spondylosis include progressive neck pain, limited head and neck movement, and pain or paraesthesia due to spinal cord or nerve root compression.

Cervical spine x-rays show narrowing of the disc space by osteophytes. Computed tomography (CT) or magnetic resonance imaging (MRI) scans of the spine confirm the location of the nerve root or spinal cord compression. Nerve conduction testing and electromyography (EMG) measure skeletal muscle activity. A myelogram can confirm the extent of nerve damage, but is not commonly used.

#### Treatment

Mild cases may improve with no treatment, or may benefit from the short-term use of a cervical collar, nonsteroidal anti-inflammatory drugs (NSAIDs), neck-care exercises, postural training and intermittent cervical traction.

Surgery to relieve compression is indicated for more severe cases or when other treatments have failed, and can provide greater short-term improvements in pain, weakness and sensation than conservative management.<sup>1</sup> The most common surgical interventions performed are decompression via an anterior cervical approach with spinal fusion or via a posterior approach with laminectomy or laminoplasty.

## Sciatica

Sciatica, a common cause of low back pain, is caused by compression of the sciatic nerve or lumbar root nerves. It is often accompanied by pain radiating from the back to the buttock and may even involve the leg.

### Diagnosis

Sciatica may cause muscle weakness, dermatomal sensory deficits, reduced reflexes and a positive straight-leg-raising test. Measurements of sensory nerve conduction velocity and motor nerve conduction velocity, waveform and amplitude may confirm the diagnosis. An MRI may be used to determine the location of a disc herniation and has largely replaced the use of a myelogram.

### Treatment

Bed rest is not recommended; mobility must be maintained.<sup>2</sup> Oral NSAIDs<sup>3</sup> and physiotherapy, including hot packs, manipulation and intermittent pelvic traction, may be beneficial. Short-term relief may be achieved using epidural corticosteroid injections and percutaneous or transcutaneous electrical nerve stimulation (PENS/TENS).<sup>4,6</sup>

Conservative management and surgical intervention show similar long-term outcomes for sciatica. However, in selected cases of sciatica associated with nerve compression by herniated disc or tumour, surgery provides rapid and effective release of neurological symptoms. Treatments for sciatica also include discectomy, which has a high success rate (80% to 96%), and chemonucleolysis, which can provide long-term relief.<sup>5</sup>

A recent study demonstrated that gabapentin, given at doses up to 3,600 mg daily in three divided doses, was effective in patients with chronic radiculopathy (L4-5 and/or L5-S1 bulging and/or protrusion).<sup>7</sup>

## Nerve injury at the peripheral level

### Carpal tunnel syndrome

Carpal tunnel syndrome, resulting from median nerve compression, causes paraesthesia, tingling, numbness, clumsiness and weakness of the affected hand.

The most common cause of carpal tunnel syndrome is repetitive stress injury or overuse syndrome, usually from repetitive finger or wrist movements. Trauma, synovitis, arthritis, vascular injury, local tumours, endocrine or metabolic disorders, infection, collagen diseases and chronic renal failure may also cause carpal tunnel syndrome.

### Diagnosis

The characteristic clinical signs of carpal tunnel syndrome are crucial in diagnosis. Hand and wrist x-rays with a carpal tunnel view and electrophysiological studies with or without needle EMG of the thenar muscle assist in establishing the diagnosis. The presence of any systemic disease must be ruled out.

### Clinical signs of carpal tunnel syndrome

- Wasting of the thenar muscles
- Weakness of thumb abduction and opposition
- Decreased pinprick sensation in the radial 3½ fingers (with intact palmar sensation)
- Positive Tinel's sign
- Positive Phalen's test

### Treatment

Conservative strategies such as good ergonomics, splinting of the wrist in a neutral position, rest at intervals and reduction of tasks requiring hand or wrist movements are beneficial. Acupuncture and ultrasound may also reduce pain.<sup>8</sup>

NSAIDs, diuretics and oral corticosteroids are options for mild-to-moderate carpal tunnel syndrome. Local steroid injection has been shown to be superior to oral corticosteroids.<sup>9,10</sup>

Surgery is indicated when conservative therapy has failed or when motor involvement or severe numbness is present. Surgery using open carpal tunnel release (OCTR) remains the preferred surgical procedure over endoscopic carpal tunnel release (ECTR).<sup>11</sup>

### Cubital tunnel syndrome

Cubital tunnel syndrome may arise from tardive ulnar palsy due to an old fracture, deformity of the elbow, rheumatoid arthritis,

**Table 1. Summary of recommendations for the management of neuropathic pain associated with peripheral nerve injury**

		Cervical spondylosis	Sciatica	Carpal tunnel syndrome	Cubital tunnel syndrome
Diagnosis	Physical examination	+	+	+	+
	X-ray	+		+	+
	CT scan	+			
	MRI	+	+		
	Myelogram	+/-	+/-		
	EPS*	+	+	+	+
Treatment	Conservative	<ul style="list-style-type: none"> <li>• Cervical collar</li> <li>• Neck care</li> <li>• Physiotherapy</li> </ul>	<ul style="list-style-type: none"> <li>• PENS/TENS</li> <li>• Physiotherapy</li> </ul>	<ul style="list-style-type: none"> <li>• Splinting</li> <li>• Physiotherapy</li> <li>• Acupuncture</li> <li>• Ultrasound therapy</li> </ul>	<ul style="list-style-type: none"> <li>• Does not have a great role in treatment</li> </ul>
	Medical	<ul style="list-style-type: none"> <li>• NSAIDs</li> </ul>	<ul style="list-style-type: none"> <li>• Oral NSAIDs</li> <li>• Gabapentin</li> <li>• Epidural steroid</li> <li>• Chemonucleolysis</li> </ul>	<ul style="list-style-type: none"> <li>• Steroids</li> <li>• Diuretics</li> </ul>	
	Surgical	<ul style="list-style-type: none"> <li>• Decompression</li> </ul>	<ul style="list-style-type: none"> <li>• Discectomy</li> </ul>	<ul style="list-style-type: none"> <li>• Carpal tunnel release</li> </ul>	<ul style="list-style-type: none"> <li>• Simple neurolysis</li> <li>• Anterior transposition of the ulnar nerve</li> <li>• Medial epicondylectomy of distal humerus</li> </ul>

\* Electrophysiological studies (EPS) are recommended when clinical diagnosis is uncertain

osteoarthritis, tumours, a subluxing ulnar nerve or a supracondylar spur. This results in pain, paraesthesia, numbness and progressive weakness along the ulnar aspect of the hand.

### Diagnosis

The clinical signs of cubital tunnel syndrome are very useful in diagnosis. An elbow x-ray with a cubital tunnel view and electrophysiological studies with or without needle EMG of the ulnar nerve confirm the diagnosis.

### Clinical signs of cubital tunnel syndrome

- Claw hand deformity
- Atrophy of intrinsic muscles, except for the thenar muscles and two radial lumbrical muscles
- Weak flexor carpi ulnaris and flexor digitorum profundus of the ring finger and little finger
- Weak finger abduction
- Reduced pinprick sensation in the ulnar 1½ fingers and corresponding area of the palm and dorsum
- Positive Froment's sign
- Positive Tinel's sign at the level of the medial epicondyle

### Treatment

Treatment of cubital tunnel syndrome frequently requires a release operation, commonly through simple neurolysis, anterior transposition of the ulnar nerve or medial epicondylectomy of the distal humerus.

### Other sites

Tarsal tunnel syndrome results from compression of the posterior tibial nerve or plantar nerves in the tarsal tunnel. Ill-fitting footwear, posttraumatic fibrosis, tendon sheath cysts or tenosynovitis, ganglia, rheumatoid arthritis, hypothyroidism, acromegaly or a thickening of the flexor retinaculum can cause tarsal tunnel syndrome.

Treatment of tarsal tunnel syndrome with no associated motor deficit includes drug therapy, such as NSAIDs and anticonvulsants (eg, gabapentin). If symptoms persist, surgical intervention to release the nerve is required.

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## CASE PRESENTATION

*In each issue, a case study is presented on a relevant neuropathic pain syndrome. Reviewing case studies will help to improve your diagnostic approach to neuropathic pain and increase your understanding of how to select treatment strategies based on presenting symptoms. In this issue, a case of neuropathic pain associated with acute cervical spinal cord injury is discussed.*

## Acute Cervical Spinal Cord Injury

### Presenting symptoms

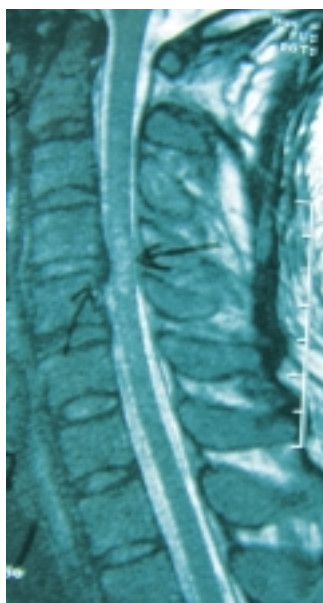
A 39-year-old male involved in a road traffic accident presented with intense bilateral upper limb paraesthesia with associated burning sensation in the affected area.

### Objective findings

The patient's muscle strength in both upper limbs was graded at 3/5 to 4/5. CT scan of the cervical spine showed a minimally displaced fracture at the left C4 transverse foramen. MRI of the cervical spine showed a prolapsed intervertebral disc at the C4-C5 level, with cord compression and increased spinal cord T2-weighted signal.

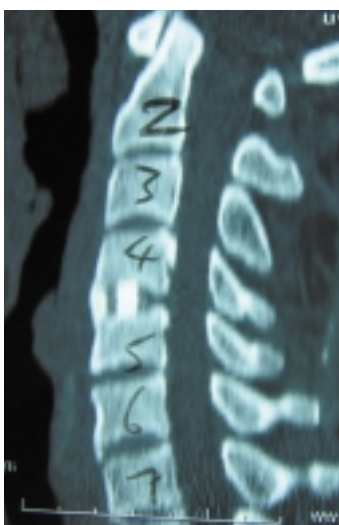
### Management

Anterior cervical decompression was performed via removal of the C4-C5 disc and insertion of a polyetheretherketone (PEEK) cage in the intervertebral space 1 day after admission. Gabapentin was given preoperatively.



MRI of prolapsed disc at C4-C5

After the surgery, muscle strength improved to normal but paraesthesia and the burning sensation persisted. Gabapentin was increased to 300 mg tid and nortriptyline 10 mg was given nightly, effectively controlling the neuropathic pain. Six weeks after surgery, the patient was able to perform activities of daily living almost independently. The patient did not respond to a reduced dose of gabapentin 300 mg bid, and was instead maintained on the original regimen until 2 months postsurgery. This regimen provided adequate



Cervical spine CT scan showed good spinal cord decompression and fusion of the vertebrae

pain control and stabilized the patient's sleep and mood patterns.

### Discussion

Neuropathic pain after cervical spinal cord injury is not uncommon and may persist even after spinal cord decompression. Experience has shown that gabapentin is effective in controlling neuropathic pain even within the first few days of the injury. Addition of a tricyclic antidepressant may be needed to control the associated burning sensation and may improve pain control.

Source: MPNP board members

## LITERATURE REVIEW

Caraceni A, Zecca E, Bonezzi C, et al. *Gabapentin for neuropathic cancer pain: a randomized controlled trial from the Gabapentin Cancer Pain Study Group.* J Clin Oncol 2004;22:2909-2917.

Infiltration or compression of adjacent nervous structures by cancer lesions can cause neuropathic pain. While opioids are the mainstay of pharmacological therapy for cancer pain, their efficacy in neuropathic pain seems to be less than optimal. Anecdotal experience with gabapentin, in combination with opioid analgesics, has shown it may be useful in treating cancer pain with a neuropathic component.

The Gabapentin Cancer Pain Study Group conducted a multicentre, randomized, double-blind, placebo-controlled, parallel-design trial to determine the efficacy of the addition of gabapentin to opioids in the management of neuropathic cancer pain. Over a 10-day follow-up period, the group studied 121 patients with documented neuropathic cancer pain partially controlled with systemic opioids. The treatment group was given gabapentin titrated from a daily dose of 600 mg to 1,800 mg, in addition to a stable opioid dose. Extra opioid doses were given as needed. Pain intensity was measured using a 0 to 10 numerical scale.

Results showed that patients in the gabapentin group had a significantly lower global pain score (4.6 vs 5.4;  $p=0.025$ ) and dysaesthesia pain score (4.3 vs 5.2;  $p=0.0077$ ) compared with placebo. The study also showed that more patients on gabapentin treatment achieved pain control during the first days of treatment ( $p=0.0048$ ). There was no significant difference between groups in the use of additional doses of opioid.

The study concluded that gabapentin is effective in improving analgesia in patients with neuropathic cancer pain already treated with opioids.

## PAIN WEB SITES

Spine-health.com ([www.spine-health.com](http://www.spine-health.com)) and spineuniverse.com ([www.spineuniverse.com](http://www.spineuniverse.com)) provide comprehensive information on back pain. Useful for both physicians and patients, these Web sites contain volumes of relevant information on spine disorders, available back pain therapies and the latest research trends. Spine-health.com also provides a message board, an online newsletter, links to spine-care products and impressive interactive back pain animations.

## CONFERENCE CALENDAR

**20th Annual Conference of the Indian Society for Study of Pain (International Association for Study of Pain, Indian Chapter)**

**28-30 January 2005, Pune, India**

Organizing Secretary:  
Dr Madhuri Lokapur  
Joshi Clinic, 1194/23, Ghole Road,  
Pune-411005, India  
Tel: +91 020 2553 5698/2553 3361  
E-mail: [info@isspcon2005.com](mailto:info@isspcon2005.com)  
Web site: [www.isspcon2005.com](http://www.isspcon2005.com)

**6th World Congress on Brain Injury**

**5-8 May 2005, Melbourne, Australia**

Secretariat:  
c/o ICMS Pty Ltd, 84 Queensbridge  
Street, Southbank, Victoria 3006,  
Australia  
Tel: +61 3 9682 0244  
Fax: +61 3 9682 0288  
E-mail: [braininjury@icms.com.au](mailto:braininjury@icms.com.au)  
Web site: [www.icms.com.au/braininjury](http://www.icms.com.au/braininjury)

## Q & A

Forward your questions on diagnosis, treatment or management of neuropathic pain to the Multidisciplinary Panel on Neuropathic Pain at [mpnp@asia.cmpmedica.com](mailto:mpnp@asia.cmpmedica.com) or fax to +852 2559 6910.

## Can postherpetic neuralgia be prevented?

Postherpetic neuralgia (PHN) is a neuropathic pain syndrome that occurs following acute herpes zoster infection, and is caused by reactivation of the varicella virus lying dormant in the sensory nerve roots of the spinal cord. PHN might affect as many as 65% of all herpes zoster patients, depending on age, severity and dermatomal involvement.<sup>1</sup> PHN is often difficult to treat and may persist for several years. As a result, patients may develop physical and social disabilities, as well as psychological distress.<sup>2,3</sup>

Theoretically, adequate analgesia in the acute phase (ie, using analgesics, antidepressants or sympathetic blocks) and prevention of C-fibre degeneration by reducing the inflammatory reaction (ie, using antiviral drugs, corticosteroids or neurotrophins) attenuate acute pain and minimize tissue damage, thereby preventing the initiation of central mechanisms of chronic pain.<sup>4</sup> However, support from clinical evidence has been limited to only a few of these interventions.

Antiviral treatment of acute herpes zoster may reduce the overall duration of pain and risk of developing PHN.<sup>5,6</sup> Clinical evidence also suggests that prophylactic treatment with low-dose amitriptyline in patients older than 60 years reduces the prevalence of PHN by more than 50%.<sup>7</sup>

A randomized, double-blind, placebo-controlled trial showed that a prophylactic intravenous injection of varicella zoster hyperimmune globulin in a dose of 2 mL/kg decreased the incidence of PHN by half.<sup>1</sup>

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CMPMedica Pacific Ltd  
Unit 901-903, 9th Floor, AXA Centre, 151 Gloucester Road,  
Wan Chai, Hong Kong  
Tel: (852) 2559 5888 Fax: (852) 2559 6910  
E-mail: [enquiry.hk@asia.cmpmedica.com](mailto:enquiry.hk@asia.cmpmedica.com)  
<http://www.asia.cmpmedica.com>