APS Newsletter

MARCH 2010

THE AUSTRALIAN PAIN SOCIETY | Leadership in clinical practice, education, research and public advocacy

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APS President's Report

It is a very busy time in the world of pain and its management. I have just returned from the National Pain Summit held in Canberra on March 11th 2010. Michael Deen, Mike Jennings and Tim Semple were also representing the Australian Pain Society (APS) at this important event and there were many other APS members amongst the 200 attendees. Nicola Roxon opened the Summit and noted the excellent timing of the release of a National Pain Strategy given the recent commitment from the government to widespread hospital and health reform. There were also excellent speeches by Helen Owens as a person afflicted with ongoing cancer pain for the past 16 years and Kieren Perkins as a carer of a loved one with longstanding pain issues. Several overseas speakers, Mary Lynch and Brenda Lau (Canada), Cathy Price (England), and David Falconer (Scotland) presented on various models of service delivery for pain management and on their experiences in putting pain on the national agenda. There was also a panel discussion with questions from the floor and break-out groups to further prioritize the key recommendations from the strategy. An interim report on the APS sponsored "Waiting in Pain" project was released and included in the hand-out materials for all delegates and there was much informal discussion of this report. This report was undertaken by Malcolm Hogg on behalf of the APS (with funding provided by the APS) and I am certain that you will be receiving much more information on this project over coming months. The interim report will be posted on the APS website in the near future. The Summit attracted strong interest from the media and helps to set the stage for lobbying government on improvements in funding and delivery of pain management services.

In other news, the APS Position Statement on Interventional Pain Management Procedures has been revised in order to address the comments and suggestions from the membership. It is currently in the process of final approval from the Board and will be sent to all members prior to the upcoming annual general business meeting. A vote will then be taken from the membership to accept this document as an official position statement from the society. Finally, just a brief reminder that our 30th annual scientific meeting at the Gold Coast is rapidly approaching (March 28-31). If you have not already registered for the meeting, then I encourage you to do so. This year is is to be held in conjunction with the New Zealand Pain Society. We have attracted some excellent international and local speakers and the program is filled to the brim with interesting workshops and concurrent sessions as well as an entertaining social program. It should be one of our best ever meetings and I look forward to seeing you all there!

Professor Stephen Gibson
President

Editor's Note

In this edition you'll find an article from our West Australian colleagues, Eric Visser and Stephanie Davies, who have expanded on Melzac's proposition that pain emanates from a neuromatrix in the brain. Their model offers: firstly an understanding of the linkages between a range of perceptions and a range of motor phenomena; and secondly an explanation

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of the occurrence of manifestations such as fear avoidance behaviour, somatoform disorders and other psychological phenomena which many of us (trained largely in a biomedical approach) find frustrating and challenging. I think you will find it stimulating reading. You will also find some final encouragement from Michael Deen to attend our annual scientific meeting, now only two weeks to go – I hope to see you there.

Happy reading,

Will Howard
Newsletter Editor

The Threat Matrix

A SUPER-SYSTEM FOR THE MANAGEMENT OF POLYMODAL THREATS, AN EXPANSION OF MELZACK'S PAIN NEUROMATRIX.

Pain is a highly personalised sensory and emotional phenomenon which is 'experienced' in our internal world of the 'self' when our tissues are under threat, in turn motivating and conditioning us to take action to avoid tissue injury.

Some neuroscientists believe that our sense of 'self' resides in a 'virtual body' (VB) generated by a 'neuromatrix' in the brain, which is modulated by a constant steam of sensory (proprioceptive, thermal, nociceptive, visual, vestibular) and cognitive inputs. In response, the neuromatrix generates 'perceptions' which we experience in our VB and also motor outputs (1).

Ronald Melzack proposed that the experience of pain is generated in the brain by a specialised sub-unit of the 'virtual body', the pain neuromatrix, in response to actual or perceived tissue damage or threat (1).

As an extension of Melzack's pain neuromatrix theory, we postulate the existence of a threat management super-system integrated in the VB, called the Threat Matrix (TM). The pain neuromatrix is a sub-system of the TM.

The TM manages a wide variety of actual or potential (perceived) threats to tissue integrity or homeostasis such as 'wounding' (eg. a traumatic limb injury), infection or inflammation (eg. the Epstein-Barr virus [EBV], autoimmune disease or cancer), sensory (e.g. an imminent attack by a sabre-toothed tiger) or cognitive inputs (e.g. the memory of a major trauma). Conceptually, the TM actually serves to defend the VB (rather than the physical body) from threat.

Various 'threatening' or noxious inputs such as fear-cognition, nociception, immunoception, chemoception, thermoception, vestibuloception, noxious olfaction or taste, or 'conflicted' sensory processing (see below) can 'activate' the TM, which in turn may generate a repertoire of defensive responses including, fear (anxiety), pain, itch, sensations of noxious heat or cold, nausea, dyspnoea (suffocation) and fatigue.

'Conflicts' in inter-sensory (eg. visual-proprioceptive, such as a 'mirror-box task') or sensory-motor processing (eg. limb amputation) are considered as 'noxious inputs' by the TM because they disrupt the 'normal' integrity of the VB.

Teleologically-speaking, the TM 'interprets' such perceptual 'dis-integration' as a 'tissue threat' and responds defensively (for example, 'generating' phantom limb pain or focal dystonia [in keyboard musicians] to prevent further tissue damage). As visual beings, the human TM would be expected to rely heavily on visual cues when assessing tissue threat.

The TM defensive repertoire also includes 'protective' motor responses (eg. limb weakness, paralysis or dystonia, to 'protect' an 'at-risk' limb), sensory responses (eg. non-dermatomal sensory deficits or 'neglect' phenomena, to ignore the 'distraction' of an 'at-risk' limb), pain behaviours ('signalling' tissue damage to others in the social group to engender help) and dissociation/depersonalization responses (as a means of 'escaping' from the VB when it is overwhelmed by threat).

These so-called quasi-neurological responses associated significant biological or psychosocial ('yellow flags') threats or stressors are frequently diagnosed as somatoform and conversion disorders but may actually represent TM defensive responses.

In evolutionary terms, it is postulated that somatisation, illness behaviours and conversion (eg. paralysis or epidemic fainting) in the face of overwhelming threat are residual survival responses which were prevalent in fertile females during the Neolithic period. During raids by rival tribesmen, such females were the targeted as potential mates. If they couldn't 'fight or flight' when attacked, feigning illness (eg. limping or even having

a 'pseudoseizure') would make them less attractive as a potential mate ('bad genes'). 'Fainting' (submission) rather than 'fighting' would also ensure their survival if escape was not possible (2).

These TM 'faint or feign' defensive responses to overwhelming threat were adaptive in Neolithic times but are now maladaptive and frequently diagnosed as 'somatisation disorders' in today's world (2).

As part of the defensive repertoire, the TM also integrates whole-person (systemic) responses to threat such as the acute stress response ('fight or flight'), the chronic stress or 'sickness' responses ('curl up and conserve') and perhaps even 'suffering'

(3,4). Suffering is an over-arching term for those negative affective and emotional experiences associated with overwhelming threat and 'inevitable helplessness'.

The TM usually produces 'congruous' defensive responses to particular noxious stimuli; nociception would normally produce pain, cutaneous chemical irritation (itch), systemic chemotoxins (nausea), thermal stimuli (noxious heat or cold), impaired gas exchange (dyspnoea), cognitive threats (fear or phobias). However as an integrated threat management super-system, we postulate that any noxious 'stimulus' could conceivably produce any-or-all of the TM's repertoire of defensive responses.

It seems logical that the greater the 'threat-load' (whether due to the number of modalities, their intensity or their duration) the more widespread (polymodal) and long-lasting the TM response will be. This model may explain widespread pain syndromes, such as fibromyalgia or post whiplash-associated neck pain, which are usually 'triggered' by nociception in concert with other 'threat-loads' (stressors) such as psychological trauma (eg. post-traumatic stress disorder), viral illness (eg. EBV), autoimmune disease or cancer.

The TM model explains how 'fear' could 'generate' pain and nausea. Panic disorder is an example of how a specific threat 'trigger' (a fearful cognition) produces a wide repertoire of symptoms (generated and integrated by the TM), including not only fear (the congruous response), but also nausea, chest and abdominal pains, dyspnoea (suffocation), bodily sensations of heat and cold, and a feeling of depersonalization. In our model, the symptoms of a panic attack reflect many of the components of the TM defensive repertoire. Interesting, functional brain imaging demonstrates that dyspnoea in response to suffocation activates similar cortical areas to those involved in pain processing (5).

It is therefore conceivable that under some circumstances (such as increased threat or stress-loading) the TM not only 'generates' pain in response to a nociceptive input, but also other defensive responses such as fear, motor (weakness, dystonia) and sensory dysfunctions (non-dermatomal sensory deficits, 'neglect'), sensations of heat or cold (eg. in the limb of a person with Complex Regional Pain Syndrome), illness behaviours, depersonalization, fatigue and whole-person stress or 'sickness' responses (4,6).

Like Melzack's pain neuromatrix, the TM is not a defined anatomical or functional entity; there is no 'threat centre' in the brain or elsewhere, just as there is no 'pain centre' (1).

The TM is currently a 'black box' which is conceptualised as a 'whole-person' threat management super-system, most likely encompassing neural (neurons and glia), immune, endocrine, paracrine and cellular sub-systems (4,6). Therefore we have deliberately not used the term neuro (matrix) in order to highlight the complex 'whole-person' processes involved in managing tissue threat, although it is likely that neural processing (sensory cortex, frontal pre-motor cortex, amygdala, hippocampus, insula,thalamus and brainstem) is integral to the function of the TM,

In conclusion, we propose the TM as a model which explains the wide-ranging and sometimes puzzling variety of threat-related phenomena seen in humans, including pain, fear (anxiety), sensory-motor dysfunction, illness behaviours, stress and sickness responses and suffering.

The TM model explains firstly the nexus between fear (anxiety) and pain, and secondly the phenomenology of so-called somatoform or conversion disorders associated with 'wounding' and psychological stressors, as being part of the TM defensive repertoire; also this model proposes a possible evolutionary origin.

Based on our TM model, it becomes clear that pain management requires more than simply dealing with nociception (with nerve blocks or drugs). It demands 'whole-person engagement' using integrated 'threat-management strategies', including stress-load

reduction, 'anxiolysis' (psychotherapy, education and information, placebo) and therapeutic modulation of the VB (virtual reality and mirror therapy) and of neuro-immune-endocrine systems.

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Invitation to ASM

STAR-STUDDED LINE-UP DESCENDS ON THE GOLD COAST FOR PAIN SOCIETIES' COMBINED ASM

The rumour mill is running hot that the speakers at this years combined Annual Scientific Meeting of the Australian Pain Society and the New Zealand Pain Society represent the crème de la crème of pain researchers from around the world.

Without hesitation I would like to take this opportunity to confirm that the rumours are true!

From the 28th March to the 31st March 2010 the Who's Who of local and international pain research and pain clinical practice will be at the Gold Coast Convention Centre to celebrate and share recent research developments in the field of pain management. This truly is an event that you won't want to miss!

Prepare to be dazzled by the knowledge and expertise of our invited speakers as they impart for you the wonders of their research careers. Be present as the future stars of pain research from Australia and New Zealand strut their stuff in the poster and free paper presentations. And soak up the sun, the surf and the sand with our special order of sunny days and warm autumnal nights on the golden Queensland coast.

If you only attend one pain conference in 2010, make sure it is the upcoming Combined Annual Scientific Meeting of the Australian Pain Society and the New Zealand Pain Society on the Gold Coast!

Believe me… you do not want to be the only person not on the Gold Coast at the end of March 2010. Book your ticket now and reserve your place for this clinical practice changing event.

Visit our conference website for more details (www.dcconferences.com.au/apsnzps).

Michael Deen
Co-Convenor

Calendar of Events

SPINE IN ACTION: LOW BACK PAIN

26 -30 March 2010
Rendezvous Hotel Auckland, New Zealand
www.musculoskeletal.co.nz
www.musmed.com

INAUGURAL COLLABORATIVE ACUTE PAIN DAY 28TH MARCH 2010

Sunday 28 March 2010
Gold Coast Convention and Exhibition Centre, Queensland
www.dcconferences.com.au/apsnzps

AUSTRALIAN PAIN SOCIETY 30TH ASM WITH NEW ZEALAND PAIN SOCIETY

28 - 31 March 2010
The Impact of Pain
Gold Coast Convention and Exhibition Centre, Queensland
www.dcconferences.com.au/apsnzps

SPINE SOCIETY OF AUSTRALIA ASM

9-11 April 2010
Christchurch Convention Centre, Christchurch, New Zealand
www.dcconferences.com.au/ssa

HONG KONG PAIN SOCIETY ANNUAL SCIENTIFIC MEETING

Unravelling the Mystery of Pain
24 - 25 April 2010
InterContinental Grand Stanford, Hong Kong
www.hkpainsociety.org

NEW FELLOWS CONFERENCE 2010

28-30 April 2010
Adventure and Anasthesia
Heritage Hotel Hanmer Springs, New Zealand

2ND INTERNATIONAL COURSE ON PAIN MEDICINE

27-29 August 2010
Montreal, Canada
www.ICPM.net

13TH WORLD CONGRESS ON PAIN

Current Concepts in Urogenital Pain
29 August - 2 September
Palais des congrès de Montréal, Montréal, Québec, Canada
www.iasp-pain.org/Montreal

THE BEST OF BOTH WORLDS

Rehabilitation 2010: Mind and Body
6 - 8 October 2010
Hilton on the Park Hotel, Melbourne
www.dcconferences.com.au/rehab2010

4TH ASIA PACIFIC CERVICAL SPINE SOCIETY CONFERENCE

3 - 6 November 2010
Hilton Hotel , Sydney, NSW
www.dcconferences.com.au/apcss

AUSTRALIAN PAIN SOCIETY 31ST ASM

11-15 June 2011
Darwin Convention Centre, Darwin , NT

New Members

Dr	Fiona	Stanaway	Public Health
Ms	Susan	Roberts	Physiotherapy
Miss	Sharni	Mabilia	Physiotherapy
Ms	Yi Ling	Chen	Psychology
Mrs	Rebecca	Donald	Nursing
Dr	Jacqui	Stanford	Psychology
Mr	David	Lehmann-Monck	Nursing
Dr	Glen	Sheh	Rehabilitation Medicine

2 WEEKS TO GO UNTIL THE COMBINED APS/NZPS ANNUAL SCIENTIFIC MEETING ON THE GOLD COAST, 28–31 MARCH 2010

If you have not already registered for the conference, please visit www.dcconferences.com.au/apsnzps to register.

Don't forget the pre-conference workshops – Psychology, Acute Pain Day and the Fundamentals of Pain Management Workshop. These are filling up fast but there are still places available.

The Gala Dinner at Movie World will certainly be one to remember – bring the family along to enjoy the rides and entertainment.