

# PAIN MANAGEMENT

## SPECIAL INTEREST GROUP

### PRESIDENT'S MESSAGE

President: John E. Garzione, PT, DPT, DAAPM (2011-2014)  
Vice President: Marie Hoeger Bement, PT, PhD (2011-2014)  
Nominating Committee: Neena Sharma, PT, PhD (2010-2013)  
Bernadette Jaros, PT (2010-2012)  
Research Chair: Joel Bialosky, PT, PhD (2011-2014)

WOW, if you have read any other information about this year's CSM in New Orleans, you have heard that it was the biggest meeting ever. The down side was that we froze our nays (no, that's not a new anatomical term) off walking between the Hilton and the Conference Center due to the unseasonable cold. The programming was excellent, as usual, and I want to personally thank the Education Committee for their fine work. The Ortho Section staff of Terri DeFlorian and Tara Fredrickson, as well as the Orthopedic Section BOD, went above and beyond to continue to make this meeting a huge success.

The SIG business meeting minutes are enclosed in this newsletter.

Our program titled, "Enhancing Clinical Practice through Psychosocial Perspectives in the Management of Low Back Pain" presented by Julie Fritz, PT, PhD; Steven George, PT, PhD; Christopher Main, PhD; and William Shaw, PhD, was well received by the 300+ attendees. This international, multidisciplinary panel consisted of authors who contributed to the PTJ special issue on psychological perspectives that will be published in April 2011. I thank these excellent presenters/researchers for their work and their informative presentation that will add to our practice of pain management.

The ISP Taskforce is busy preparing topics and speakers for the pain management home study courses that we hope will be available for purchase in the near future.

Hope you have a wonderful spring.

*John E. Garzione, PT, DPT, DAAPM*

### PAIN SIG MEETING MINUTES CSM 2011 NEW ORLEANS

Friday, February 11, 2011

The meeting was called to order at 7:00 a.m. by John Garzione, President.

Last year's minutes were published in *OPTP* and approved.

All involved with SIG activities were thanked for their participation over the past year. Joel Bialosky was especially thanked for his contributions to the quarterly E-mail blasts. We still need more articles for the *OP* newsletter; submissions can be emailed to [johngarzione@frontiernet.net](mailto:johngarzione@frontiernet.net).

Marie Hoeger Bement was re-elected Vice President and John Garzione was re-elected President of the SIG with both

terms expiring in 2014. Thanks go to the Nominating Committee of Neena Sharma and Bernadette Jaros. Short discussion was held about the expiring terms for President and Vice Presidents at the same time. Since the group is still small, it was decided to leave the term limits as they stand for now unless that poses a problem in 3 years.

Two conference calls were held last year to discuss ISC course titles. The members felt that doing the ISC courses should be pursued, but a pain management subspecialty examination should be tabled at this time. Neena Sharma requested to be included in the conference call list.

ISC course topics were discussed and the course committee members will be asked by E-mail for course topic suggestions for submission to ISC Editor, Chris Hughes. Some suggestions were: Basic Neurosciences, Pain Mechanisms, Interventions, Pain Assessment, Neuropathic Pain, Central Pain, with more topics to follow. The E-mail will also include an attachment of the "instructions to authors." (John G. will do this.)

Facebook Posts: John Ware volunteered to submit monthly posts from the PMSIG to the Ortho Section's Facebook page.

The consensus of the meeting attendees was that since pain encompasses all areas of physical therapy, the SIG is interested in bringing new information of pain education to all Sections.

The meeting was adjourned at 7:45 a.m.

*Respectfully submitted by John E. Garzione, President*

### What and Who is the "Difficult" Patient? The Role of Stress and Central Sensitization in Persistent, Widespread Musculoskeletal Pain

**John Ware, PT, MS, FAAOMPT**

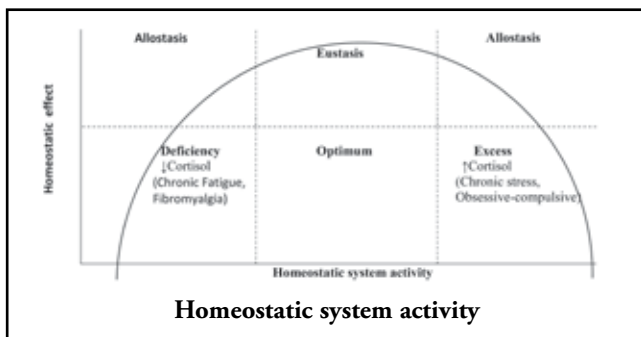
Physical therapists who use manual techniques for patients with musculoskeletal pain problems are particularly aware of the multiple manifestations and complexity of persistent pain. The variability in responses to manual techniques for painful conditions is evident on both a casuistic level as well as in outcomes studies on randomly sampled populations of patients. To wit, despite recent findings validating the beneficial effects of spinal manipulation for patients with acute low back pain,<sup>1</sup> results on nonsurgical treatments for patients with chronic, nonspecific low back pain (CNSLBP) have demonstrated small effect sizes, at best.<sup>2</sup> Recently, Wand and O'Connell<sup>3</sup> have suggested that our approach to the problem of chronic pain from a biomechanical/biomedical perspective resulting in classification schemes that are based in patterns of defects or impair-

ments in biomechanics may be misdirected:

CNSLBP patients have back pain yet no conservative or surgical pain relieving measures directed at the back appear effective. They display a number of biomechanical abnormalities, however, treatment directed at normalising lumbar biomechanics has little effect and there is no relationship between changes in outcome and changes in spinal mechanics. Finally, these patients demonstrate some psychological problems but psychologically based treatments offer only partial solution to the problem. A possible explanation for these findings is that they are epiphenomena, features that are incidental to a problem of neurological reorganisation and degeneration.

These authors make a plausible and well-referenced argument that a persistent, nonpathological pain state such as CNSLBP is a manifestation of aberrant cortical processing in the brain as opposed to a collection of peripheral impairments in strength, flexibility, posture, or body mechanics. Evidence showing that the best predictors of chronic musculoskeletal pain and disability are psychosocial in nature<sup>4</sup> supports the idea that biomechanical manifestations of persistent pain may actually exist as defensive, albeit maladaptive, strategies of a homeostatic system struggling to cope with a multitude of intrinsic and extrinsic stressors.

A recent review by Chrousos<sup>5</sup> details the dominant physiological processes in play when the human organism is under stress. He describes the neurophysiological pathways exerted by neuroimmune processes in the brain's hypothalamic-pituitary-adrenal (HPA) and the locus ceruleus-norepinephrine (LC-NE) axes, which are responsible for producing an appropriate response to internal and external stressors. A modified version of a figure from the Chrousos paper<sup>5</sup> is provided below to illustrate how suboptimal effects can lead to either deficient or excessive adaptation, along with examples of each condition's common clinical diagnoses:

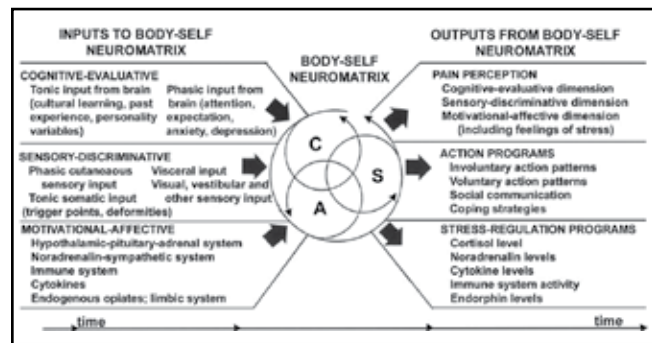


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The inverted U-shape curve depicts how homeostatic system activity exerts influence on complex homeostatic effects, and graphically shows the dose-dependent relationship of activity to these effects. The consequences of maladaptive responses to stress are maladaptive disorders and diseases that physical therapists often encounter due to their involvement in the treatment of patients with persistent musculoskeletal pain complaints.

One of the complex effects exerted by the stress system is the release of inflammatory mediators, including a variety of cytokines, neuropeptides, prostaglandins, and leukotrienes.<sup>6</sup> This results in the production of what has been termed an “inflammatory soup”<sup>7</sup> at the site of injury, or actually within tissues where injury--or a danger threat--is perceived. Therefore, from the biomedical/biomolecular perspective, it could be argued that all pain is ultimately “inflammatory” in nature, although different pain syndromes will display a distinctive “inflammatory” biochemical profile.<sup>6</sup>

In addition to these cellular and humoral processes, however, many behavioral responses, including fear and/or anger, are also triggered through the HPA/LC-NE axes. One of these is a motor response. According to Melzack's neuromatrix theory,<sup>8</sup> part of the behavioral response to a painful stimulus includes an “Action Program” as depicted here in the “Neuromatrix Diagram:”



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An appropriate motor response is part and parcel of the adaptive return to eustasis, as described by Chrousos.<sup>5</sup> An aberrant motor output then is another consequence of the persistent pain state, which is of particular interest to the physical therapist (PT) since it is the neuromusculoskeletal system that produces movement and that PTs are uniquely trained to treat. The “Sensory-Discriminative” class of input midway down on the left side of the neuromatrix diagram is ostensibly what physical therapists are trying to affect with manual and movement therapies. If the therapist can introduce some novel input that the brain does not perceive as nociceptive, then it may sense no further survival threat to the organism it's charged with protecting. Furthermore, it will try to interact with itself and the new input at nonconscious levels (the brain as “self-referential hub”), which may help it resolve the maladaptive response it has marshaled against the perceived noxious threat. The “Cognitive-Evaluative” class of input at the top on the left hand side of the diagram is affected and potentially modified by education about pain and better information on how the patient might understand and cope with it. Simply understanding pain on a detached, factual level has been shown to be helpful for certain chronic pain conditions.<sup>9</sup> (\*See footnote below for additional attribution.)

\*Much of the information described here regarding the different dimensions of the pain neuromatrix was paraphrased from personal communication with Diane Jacobs, PT, Saskatoon, SA Canada.

Thus, stress leads to normal physiological responses that in some patients can lead to aberrant reactions causing the stress system to go awry. What are the features of these patients and how can the clinicians who treat them identify them better, and perhaps gear treatments more suited to their needs? Nijs et al<sup>10</sup> have recently published a review that examines the process and characteristics of central sensitization (CS), which in certain patients can be considered the ultimate manifestation of the stress response run amok. However, according to Latremoliere and Woolf,<sup>11</sup> the initial process of CS that is predominant after trauma or surgery is distinctly different from that seen in patients with chronic/persistent pain. They describe a biochemically distinct process that is phosphorylation-dependent in the former versus transcription-dependent in the latter, which includes the production of new proteins in the synaptic cell membrane. This explains how temporally sustained CS results in very biochemically complex structural or “plastic” changes in the nervous system. If sustained for too long (ie, beyond the time required for tissues to heal adequately), the result is the transcription-dependent form of CS, which according to these authors is mediated by sustained peripheral inflammation and nerve injury.<sup>11(p 904)</sup>

Nijs et al<sup>10</sup> continue on to describe clinically useful methods of identifying this maladaptive response to stress typical of the transcription-dependent, neuroplastic form of CS. Physical therapists are aware of several medical diagnoses that are typically associated with CS such as fibromyalgia, certain types of whiplash associated disorders, and chronic nonspecific low back pain, to name a few. However, these authors caution that the medical diagnosis alone may not be sufficient to determine the presence of CS, and current research is yet unclear on the relationship between many medical diagnoses and CS. However, certain symptoms and signs in combination with the medical diagnosis can be helpful in identifying the presence of CS. They break the symptoms down into two classes--those that are characteristic of CS and those that might be characteristic of CS:

Characteristics of Central Sensitization:

- Hypersensitivity to bright light
- Hypersensitivity to touch
- Hypersensitivity to noise
- Hypersensitivity to mechanical pressure
- Hypersensitivity to medication
- Hypersensitivity to temperature

Might be Related to Central Sensitization:

- Fatigue
- Sleep disturbances
- Unrefreshing sleep
- Concentration difficulties
- Swollen feeling, eg, in limbs
- Tingling/Numbness

Adapted from Nijs et al 2010, p 3

Clinical signs of CS can be relatively simple to identify. One of the easiest ways to identify the presence of CS is by performing pressure pain threshold testing in an area distant from the patient’s primary complaint. A pressure algometer is used to identify the presence of pain below the normal threshold of

4kg/cm<sup>2</sup>. These authors also suggest the use of a hot or cold stimulus remote from the primary site of nociception to determine hypersensitivity and potential CS. A well-researched phenomenon is the increase in pressure pain threshold associated with exercise in normal individuals. However, no change or a decrease in pressure pain threshold following exercise (through algometry) suggests CS. Finally, in this same paper Nijs et al refer to the research by separate groups studying the role of neural tension testing in various patient populations. Sterling and Kenardy<sup>12</sup> have found an association between the likely presence or absence of CS and measurably significant differences in hypersensitivity during neural tension testing in the upper extremity. Furthermore, Coppiters et al<sup>13</sup> found that neurodynamic testing remained stable and reliable over a 48-hour period. Therefore, neurodynamic testing as described by Butler<sup>14</sup> and more recently by Shacklock,<sup>15</sup> may provide a valid conceptual paradigm for physical therapists to use that can meaningfully differentiate patients with or without CS based on their level of onset and submaximal pain provocation during neurodynamic testing.

In addition to metrics that directly relate to and assess the “difficult” patient’s biophysical state, it has already been mentioned that psychosocial variables are known to play a significant role in the prediction of pain chronicity. What are the best ways to identify *who*, in addition to *what*, these patients are?

Several clinical assessment tools for identifying and grading pain behavior have become available to PTs over the years. One of the more widespread clinical testing schemes used is based on Waddell’s classic study of non-organic physical signs in low back pain.<sup>16</sup> However, this particular biopsychosocial framework has been criticized for its inability to appreciate the ultimate subjectivity of the pain experience. An objective determination of psychological distress is made entirely by the clinician’s discretion, which is fraught with potential contaminating variables and circular reasoning errors. In fact, Quintner et al<sup>17</sup> effectively critiques the entire biopsychosocial model as an explanatory theory of pain for the very reason that the ultimate “aporia” of pain makes it objectively unknowable. As Quintner et al put it:

Our examination of the conceptual proposals generated within the biopsychosocial framework reveals that there has been no resolution of how the different domains of analysis relate to each other, let alone explain the phenomenon of pain. The exercise reflects our desire for sense-making rather than in fact making sense.<sup>p6</sup>

Thus, clinicians and researchers struggle in their theorizing about pain as they reason around in circles trying to make sense of the non-sense-able.

With these profound limitations in mind, ethical clinicians remain obligated to help their patients with persistent pain find relief. Several other recent patient questionnaires have been developed in an effort to understand what it is patients are trying to tell us from their aporia of pain. On one end of the conceptual continuum, they have been asked about the abstract notion of fear-avoidance beliefs,<sup>18</sup> and on the other more explicit end they have been asked to describe their pain with a variety of descriptive adjectives.<sup>19</sup>

Arguably, however, these methods fail to extract sufficient meaning or provide dialectic synthesis because they do not

adequately address the multidimensionality of the pain neuromatrix. There is a recently developed clinical tool that has undergone preliminary validation studies that shows promise for describing the patient with persistent pain from a more comprehensive, albeit evolving, perspective. The instrument is called the Pain Beliefs Screening Instrument (PBSI), and was developed by Sandborgh et al<sup>20</sup> in 2007. These authors suggest that, in addition to pain intensity physical therapy should be most concerned with psychological factors that are known to produce altered motor outputs, such as fear of movement/injury, self-efficacy, and catastrophizing. Such an instrument as the PBSI, which addresses these key factors related to chronic disability due to pain, is more likely to not only provide a risk profile for patients at high or low risk of disability, but also produce a detailed patient classification capable of guiding specific treatment interventions.

Manual and movement therapies for the “difficult” patients who are suffering with persistent pain have become culturally accepted practices even in advanced, industrialized societies. However, with such affluence, the potential for exploiting the “aporia” by proposing all manner of “snake oil” in order to alleviate pain and suffering can come at major financial and, at times, mortal costs. Popular news stories are frequently reported about the latest parent who refuses traditional treatment for their seriously-ill child in favor of some “miracle” remedy from “natural” substances, or some celebrity goes on television and radio extolling the virtues and life-extending capabilities of some mixture of herbs. We in the profession of physical therapy are not immune from the subtle corrupting potential of the aporia of pain. Physical therapists have embraced many techniques for the treatment of pain that have failed to stand up to scientific rigor, yet their use in clinical practice continues. Physical therapists pay large sums of money for continuing education courses to learn these techniques and gain credentials behind their names, which make claims that no scientific study, not to mention prior scientific plausibility, has been able to support. Only through ongoing rational understanding and vigorous study of the multidimensional pain experience, guided by a compassionate desire to help others, will effective and expedient conservative treatments for patients with difficult pain problems ultimately come about.

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