

The Journal of Pain

Table of Contents

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Editorial

1 The Growing Impact of *The Journal of Pain*

Mark P. Jensen, Editor-in-Chief

Critical Review

3 The Effects of Graded Motor Imagery and Its Components on Chronic Pain: A Systematic Review and Meta-Analysis

K. Jane Bowering, Neil E. O'Connell, Abby Tabor,
Mark J. Catley, Hayley B. Leake, G. Lorimer Moseley,
and Tasha R. Stanton

Graded motor imagery (GMI) is becoming increasingly used in the treatment of chronic pain conditions. This systematic review sought to synthesize evidence concerning the effects of GMI and its constituent components on chronic pain. This knowledge may assist clinicians in making evidence-based decisions on managing patients with chronic pain conditions.

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ON THE COVER

Nerve injury results in the activation and recruitment of inflammatory cells leading to changes in the microenvironment that are associated with the development of neuropathic pain. In this image, cell staining and flow cytometry analysis for several inflammatory cell types is shown. See Liou, et al, page 24.

Original Reports

14

A Randomized, Placebo-Controlled Study of the Impact of the 7-Day Buprenorphine Transdermal System on Health-Related Quality of Life in Opioid-Naïve Patients With Moderate-to-Severe Chronic Low Back Pain

Aaron Yarlas, Kate Miller, Warren Wen, Bradley Dain, Shau Yu Lynch, Joseph V. Pergolizzi, Robert B. Raffa, and Steven R. Ripa

The impact of treatment with Butrans on the health-related quality of life for patients with moderate-to-severe chronic low back pain was evaluated, as was the correspondence between quality of life and pain. This post hoc analysis suggests that patients with moderate-to-severe chronic low back pain who were treated with buprenorphine exhibit better health-related quality of life than those using placebo within 4 weeks of treatment. They were more likely to exhibit clinically meaningful improvements in quality of life following 12 weeks of treatment.

24

Peritoneal Administration of Met-RANTES Attenuates Inflammatory and Nociceptive Responses in a Murine Neuropathic Pain Model

Jiin-Tarng Liou, Chih-Chieh Mao, Daniel Ching-Wah Sum, Fu-Chao Liu, Ying-Shu Lai, Jui-Chin Li, and Yuan-Ji Day

Nerve injury results in the activation and recruitment of inflammatory cells leading to changes in the microenvironment that are associated with the development of neuropathic pain. Chemokines play an important role in modulating inflammation and immunity and in regulating the generation of inflammatory cells. This study identifies the potent pro-inflammatory potential of C-C motif chemokine ligand 5 (CCL5) and verifies the possible role of selective CCL5 receptor inhibitor in a murine neuropathic pain model.

36

Epigenetic Regulation of Opioid-Induced Hyperalgesia, Dependence, and Tolerance in Mice

De-Yong Liang, XiangQi Li, and J. David Clark

Opioids currently constitute the cornerstone therapy for moderate to severe pain of many etiologies. One of the more controversial aspects of their use relates to uncertainties and concerns about adaptations to chronic use. Repeated administration of opioids such as morphine induces behavioral changes, including opioid-induced hyperalgesia (OIH), tolerance, and physical dependence. This report explores how the balance of histone acetyltransferase (HAT) versus histone deacetylase (HDAC) might regulate these morphine-induced changes.

48

Postoperative Subcutaneous Instillation of Low-Dose Ketorolac But Not Hydromorphone Reduces Wound Exudate Concentrations of Interleukin-6 and Interleukin-10 and Improves Analgesia Following Cesarean Delivery

Brendan Carvalho, Harry J. Lemmens, Vicki Ting, and Martin S. Angst

This study tested the effects of low-dose ketorolac and hydromorphone added to continuous local anesthetic wound instillation on surgical-site inflammatory mediators, postoperative pain, and opioid consumption. The results demonstrate that low-dose ketorolac administered into wounds modulates local inflammatory events, decreases postoperative pain, and reduces opioid consumption. Postoperative subcutaneous instillation of low-dose ketorolac—but not hydromorphone—reduces wound exudate concentrations of interleukin-6 and interleukin-10, and improves analgesia following cesarean delivery.

57

Stimulation of Cutaneous Low Threshold Mechanoreceptors in Mice After Intracolonic Capsaicin Increases Spinal c-Fos Labeling in an NKCC1-Dependent Fashion

Mark H. Pitcher, Francisco R. Nieto, and Fernando Cervero

While touch normally soothes acute pain, these findings demonstrate that following peripheral inflammation, touch evokes pain (allodynia) through the switching of a normally inhibitory spinal pathway into an excitatory pathway. Activation of low threshold mechanoreceptors activates spinal nociceptive neurons following inflammation-induced enhancement of NKCC1 expression, as measured by spinal c-Fos labeling. This provides evidence that increased NKCC1 activity contributes to secondary allodynia and that innocuous touch can access the nociceptive channel in part through enhanced NKCC1 activity.

66

Topical Combinations Aimed at Treating Microvascular Dysfunction Reduce Allodynia in Rat Models of CRPS-I and Neuropathic Pain

J. Vaigunda Ragavendran, André Laferrière, Wen Hua Xiao, Gary J. Bennett, Satyanarayana S. V. Padi, Ji Zhang, and Terence J. Coderre

Growing evidence indicates that various chronic pain syndromes exhibit tissue abnormalities caused by microvasculature dysfunction in the blood vessels of skin, muscle, or nerve. This research tested whether topical combinations aimed at improving microvascular function would relieve allodynia in animal models of CRPS-I and neuropathic pain. The findings present the synergistic antiallodynic effects of combinations of α_2A or nitrous oxide donors with phosphodiesterase or phosphatidic acid inhibitors in animal models of CRPS-I and neuropathic pain. The data suggest that effective clinical treatment of chronic neuropathic pain may be achieved by therapies that alleviate microvascular dysfunction in affected areas.

79

Test-Retest Reliability of Thermal Temporal Summation Using an Individualized Protocol

Jiang-Ti Kong, Kevin A. Johnson, Raymond R. Balise, and Sean Mackey

Temporal summation (TS) refers to the increased perception of pain with repetitive noxious stimuli. It is a behavioral correlate of wind-up, the spinal facilitation of peripheral C-fiber stimulation. In order to utilize TS in clinical pain research, it is important to characterize TS and to establish its test-retest reliability. This report introduces a new strategy to generate thermal TS in a high proportion of individuals and confirms the test-retest reliability of thermal TS, supporting its use as a consistent behavioral correlate of central nociceptive facilitation.

89

Functional Features of Nociceptive-Induced Suppression of Alpha Band Electroencephalographic Oscillations

Li Hu, Weiwei Peng, Elia Valentini, Zhiguo Zhang, and Yong Hu

The authors examined whether α -ERD could be functionally distinguished in 2 temporally and spatially segregated subcomponents as suggested by previous studies. In addition, they considered whether the degree of dependence of nociceptive-induced α -ERD magnitude on the prestimulus α -power would have been larger than the degree of dependence on the poststimulus α -power. These findings provide evidence that the nociceptive-induced α -ERD reflects the summation of sensory-related and task-related cortical processes, and that prestimulus fluctuations can remarkably influence the non-phase-locked nociceptive α -ERD.

100

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