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REVIEW ARTICLES

107 **Exercise Interventions for Persistent Non-Specific Low Back Pain – Does Matching Outcomes to Treatment Targets Make a Difference? A Systematic Review and Meta-Analysis**

Lianne Wood, Nadine E Foster, Martyn Lewis, and Annette Bishop

Exercise can be considered a complex intervention, with both physiological effects as well as impacts on psychological well-being and social function. Exercise is a core treatment for persistent non-specific low back pain (NSLBP), but results from randomized controlled trials of exercise typically show only small to moderate differences, compared with non-exercise controls. This review systematically identified, synthesized and analyzed the treatment targets and outcomes of exercise trials for patients with persistent NSLBP with adequate statistical power to detect at least moderate effect sizes between exercise and comparison interventions.

127 **Systematic Review of Research Methods and Reporting Quality of Randomized Clinical Trials of Spinal Cord Stimulation for Pain**

Ewan McNicol, McKenzie Ferguson, Kathleen Bungay, Emily L. Rowe, Sam Eldabe, Jennifer S. Gewandter, Salim M. Hayek, Nathaniel Katz, Brian H. Kopell, John Markman, Ali Rezai, Rod S. Taylor, Dennis C. Turk, Robert H. Dworkin, Richard B. North, and Simon Thomson

This systematic review assessed design characteristics and reporting quality of published randomized clinical trials of spinal cord stimulation (SCS) for treatment of pain in adults and adolescents. The authors sought to assess research methods employed, consider outcomes, and summarize patient characteristics. The review identifies deficiencies in both methodology and reporting, which may inform the design of future studies and improve reporting standards .

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ON THE COVER

The management of persistent postsurgical pain and neuropathic pain remains a challenge. Local anesthetics have been widely used as simple and effective treatment for these disorders, but the duration of their effect is short. This study reports on a new poly lactic-co-glycolic acid (PLGA)-coated ropivacaine that was continuously released in vitro for at least six days. This injectable PLGA-coated ropivacaine represents a new and highly promising avenue in the management of postsurgical pain and neuropathic pain, the authors conclude. See Tian, et al, Page 180.

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Acceptance and Commitment Therapy for Primary Headache Sufferers: A Randomized Controlled Trial of Efficacy

Vasilis S. Vasiliou, Evangelos C. Karademas, Yiolanda Christou, Savvas Papacostas, and Maria Karekla

Prevention of headaches via avoidance of triggers remains the main behavioral treatment suggestion for headache management. New approaches, such as Acceptance and Commitment Therapy (ACT), instead emphasize acceptance and valued living as alternatives to avoidance. Though ACT is an empirically supported treatment for chronic pain, there is limited evidence for headache management. This study compared an ACT-based intervention to wait-list control. The ACT approach was found to improve disability, functioning, and quality of life among patients with primary headaches.

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Predictors of Mucosal and Muscle Pain in Vulvodynia: A Cross-Sectional Analysis From the National Vulvodynia Registry

Lydia Lo, Georgine Lamvu, Meryl Alappattu, Kathryn Witzeman, Daniela Markovic, and Andrea Rapkin

Diagnostic criteria for provoked vestibulodynia (PVD) rely on mucosal pain in the vulvar vestibule, with less emphasis on pain from pelvic floor muscles. It is unknown how psychosocial variables associated with PVD are differentially associated with mucosal versus muscle pain. This report indicates that patients with higher pelvic floor muscle pain scores than mucosal pain scores may represent different subgroups or characteristics of patients with provoked vestibulodynia. This highlights the importance of assessment of the pelvic floor muscles in addition to the cotton swab test of the vestibule.

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DACC Resting State Functional Connectivity as a Predictor of Pain Symptoms Following Motor Vehicle Crash: A Preliminary Investigation

Jacklynn M. Fitzgerald, Emily L. Belleau, Lauren E. Ehret, Colleen Trevino, Karen J. Brasel, Christine Larson, and Terri deRoos-Cassini

Motor vehicle crashes (MVCs) are a leading cause of traumatic injuries in the United States and account for over 20% of all severe injuries that require hospital care. There is significant heterogeneity in pain outcomes following MVCs such that a sizeable portion of individuals develop symptoms of chronic pain months after injury, while others recover. Despite variable outcomes, the pathogenesis of chronic pain is currently unclear. This article presents evidence of distinct neural vulnerabilities that predict chronic pain in MVC survivors based on whole-brain connectivity with the dorsal anterior cingulate cortex.

180 **Injectable PLGA-Coated Ropivacaine Produces A Long-Lasting Analgesic Effect on Incisional Pain and Neuropathic Pain**

Xue Tian, He Zhu, Shibin Du, Xue-Qing Zhang, Fuqing Lin, Fengtao Ji, Yung-Hao Tsou, Zhongyu Li, Yi Feng, Kathryn Ticehurst, Stephen Hannaford, Xiaoyang Xu, and Yuan-Xiang Tao

The management of persistent postsurgical pain and neuropathic pain remains a challenge. Local anesthetics have been widely used as simple and effective treatment for these disorders, but the duration of their effect is short. This study reports on a new poly lactic-co-glycolic acid (PLGA)-coated ropivacaine that was continuously released *in vitro* for at least six days. This injectable PLGA-coated ropivacaine represents a new and highly promising avenue in the management of postsurgical pain and neuropathic pain, the authors conclude.

196 **The Time Course of Facial Expression Recognition Using Spatial Frequency Information: Comparing Pain and Core Emotions**

Shan Wang, Christopher Eccleston, and Edmund Keogh

Humans are able to recognize others' experience of pain from their facial expressions. However, little is known about what makes the recognition of pain possible and whether it is similar or different from core emotions. This study investigated mechanisms underpinning the recognition of pain expressions, in terms of spatial frequency information analysis, and compared pain with two core emotions, fear and happiness. Findings show that a more complex decoding process may be involved in the successful recognition of pain from facial expressions, possibly due to the multidimensional nature of pain experiences. At very early stages of attention, the recognition of pain was found to be more difficult than fear and happiness.

209 **Chronic Pain and Premature Aging – The Moderating Role of Physical Exercise**

Yael Lahav, David Levy, Avi Ohry, Gabi Zeilig, Meir Lahav, Hava Golander, Anat-Chacham Guber, Orit Uziel, and Ruth Defrin

Chronic pain induces a multitude of harmful effects. Recently it has been suggested that chronic pain is also associated with premature aging, manifested in shortened telomere length (TL). However, evidence for this hypothesis is scarce and inconsistent. The aim here was twofold: 1) Investigate whether chronic pain is associated with premature aging, and 2) determine whether physical exercise moderates this association. Findings suggest it is important to monitor signs of premature ageing among chronic pain patients as they are at risk. However, pain patients may benefit from regular exercise in this respect as it may moderate premature ageing.

Altered Brainstem Pain Modulating Circuitry Functional Connectivity in Chronic Painful Temporomandibular Disorder

Emily P. Mills, Rahena Akhter, Flavia Di Pietro, Greg M Murray, Chris C Peck, Paul M. Macey, and Luke A. Henderson

There is evidence from preclinical models of chronic pain and human psychophysical investigations to suggest that alterations in endogenous brainstem pain-modulation circuit functioning are critical for the initiation and/or maintenance of pain. While preclinical models have begun to explore the functioning of this circuitry in chronic pain, little is known about such functioning in humans with chronic pain. The aim of this investigation was to determine whether individuals with chronic non-neuropathic pain, painful temporomandibular disorders (TMD), display alterations in brainstem pain-modulating circuits. The authors report that individuals with painful TMD display altered static and dynamic functional connectivity within the brainstem pain-modulation network. Modifying this circuitry may alter an individual's ongoing pain.

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