

The Journal of Pain

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Volume 21, Number 1–2, January/February 2020

EDITORIAL

- 1** **Editorial: Welcome back!**
Mark P. Jensen

REVIEW ARTICLES

- 2** **Systematic Review and Meta-Analysis of Genetic Risk of
Developing Chronic Postsurgical Pain**
Vidya Chidambaran, Yang Gang, Valentina Pilipenko,
Maria Ashton, and Lili Ding

This systematic review comprehensively describes 21 studies evaluating genetic association with CPSP, and limitations thereof. A meta-analysis of 6 variants (5 genes) found marginally increased risk for CPSP associated with rs734784 A>G of the potassium voltage-gated channel gene (KCNS1). Understanding genetic predisposition for CPSP will enable prediction and personalized management.

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ON THE COVER

Orofacial pain is characterized by its easy spread to adjacent areas, thus presenting with primary hyperalgesia (hypersensitivity at the site of injury) and secondary hyperalgesia (extra-territorial hypersensitivity outside the injured zone). The mechanisms behind the secondary hyperalgesia are poorly understood. In this study, the authors used a mouse model of partial transection of the infraorbital nerve (pT-ION) to study whether calcium channel subunit $\alpha 2\delta 1$ (*Cav α 2 δ 1*) and its downstream signaling contributes to the development of secondary hyperalgesia in the orofacial area. See Chu, et al, Page 238.

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**Are Functional Brain Alterations Present in Low Back Pain?
A Systematic Review of EEG Studies**

Stijn Schouppe, Sophie Van Oosterwijck, Lieven Danneels,
Stefaan Van Damme, and Jessica Van Oosterwijck

This review presents an overview of the current understanding of the functional LBP brain measured with EEG. The limited evidence in current research suggests altered cortical function regarding balance control, somatosensory processing, and decision making in LBP, and highlights opportunities for future EEG-research.

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**Quantification of Small Fiber Neuropathy in
Chemotherapy-Treated Patients**

Hannah C. Timmins, Tiffany Li, Matthew C. Kiernan,
Lisa G. Horvath, David Goldstein, and Susanna B. Park

This review provides a critical analysis of Small Fiber Neuropathy associated with neurotoxic cancer treatments and the assessment tools for evaluating small fiber dysfunction in cancer patients. Quantification of small fiber involvement in CIPN will assist in identifying subgroups of patients with neuropathic symptoms which may respond to existing pain medications.

ORIGINAL REPORTS

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**ICD-10 Codes for the Study of Chronic Overlapping Pain
Conditions in Administrative Databases**

Andrew Schrepf, Vy Phan, J. Quentin Clemens, William Maixner,
David Hanauer, and David A. Williams

This article presents a set of The International Classification of Diseases-10 codes that researchers can use to explore the presence and overlap of chronic overlapping pain conditions (COPCs) in administrative databases. This may serve as a tool for estimating samples for research, exploring comorbidities, and treatments for individual COPCs, and identifying mechanisms associated with their overlap.

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**Physical Therapy Informed by Acceptance and Commitment
Therapy (PACT) Versus Usual Care Physical Therapy for Adults
With Chronic Low Back Pain: A Randomized Controlled Trial**

Emma Godfrey, Vari Wileman, Melissa Galea Holmes,
Lance M. McCracken, Sam Norton, Rona Moss-Morris,
Sandra Noonan, Massimo Barcellona, and Duncan Critchley

Psychologically informed physical therapy has great potential but there are challenges in implementation. The training and support included in the PACT trial enabled the intervention to be delivered as planned. This successfully reduced disability in the short but not long term. Findings could inform physical therapists' treatment of chronic low back pain.

- 82** **Identifying Plasma Derived Extracellular Vesicle (EV) Contained Biomarkers in the Development of Chronic Neuropathic Pain**
- Natasha M. Sosanya, Raina Kumar, John L. Clifford, Roger Chavez, George Dimitrov, Seshamalini Srinivasan, Aarti Gautam, Alex V. Trevino, Molly Williams, Rasha Hammamieh, Bopaiah P. Cheppudira, Robert J. Christy, and Stephen L. Crimmins
- This article describes the DE miRNA content of plasma derived EVs, comparing neuropathic pain to normal conditions. This data indicates that EV miRNAs may be important in nociception and may also serve as biomarkers for chronic pain. These results encourage further research on EV miRNAs in chronic neuropathic pain sufferers.
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- 97** **Daily Peer Victimization Experiences of Adolescents With and Without Chronic Pain: Associations With Mood, Sleep, Pain, and Activity Limitations**
- Jessica L. Fales, Lexa K. Murphy, Jason D. Rights, and Tonya M. Palermo
- This article examines the temporal influence of peer victimization on pain in adolescents with and without chronic pain, and examines mood and sleep quality as mechanisms linking victimization to pain. This information may be useful for pain prevention researchers as well as providers who assess and treat pain in childhood.
-
- 108** **Examining the Adjustment Patterns of Adults With Multiple Chronic Pain Conditions and Multiple Pain Sites: More Pain, No Gain**
- Chung Jung Mun, Linda Ruhlman, and Paul Karoly
- This article argues for the importance of assessing the number of co-occurring chronic pain conditions and bodily areas that are affected by pain in both pain research and clinical settings. Measuring and incorporating such information could potentially enhance our nascent understanding of the adjustment processes of chronic pain.
-
- 121** **Regional Differences Within the Anterior Cingulate Cortex in the Generation Versus Suppression of Pain Affect in Rats**
- Casey A. Mussio, Steven E. Harte, and George S. Borszcz
- NMDA receptor activation of the rostral and caudal anterior cingulate cortex (ACC) respectively inhibited or enhanced rats' emotional response to pain. These findings mirror those obtained from human neuroimaging studies; thereby, supporting the use of this model system in evaluating the contribution of ACC to pain affect.

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Predicting Opioid Use, Increased Health Care Utilization and High Costs for Musculoskeletal Pain: What Factors Mediate Pain Intensity and Disability?

Trevor A. Lentz, Daniel I. Rhon, and Steven Z. George

This article examines underlying characteristics that help explain relationships between pain intensity and disability, and the outcomes of health care utilization and costs. Health care systems can use these findings to refine value-based prediction models by considering factors that differentially influence outcomes for health care use and cost of services.

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A Novel Mu-Delta Opioid Agonist Demonstrates Enhanced Efficacy With Reduced Tolerance and Dependence in Mouse Neuropathic Pain Models

Wei Lei, Rakesh H. Vekariya, Subramaniam Ananthan, and John M. Streicher

This study demonstrates that a MOR-DOR dual agonist given chronically in chronic neuropathic pain models has enhanced efficacy with strongly reduced tolerance and dependence, with a further anti-inflammatory effect in the spinal cord. This suggests that MOR-DOR dual agonists could be effective treatments for neuropathic pain with reduced side effects.

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Moderators of Mindfulness Meditation, Cognitive Therapy, and Mindfulness-Based Cognitive Therapy for Chronic Low Back Pain: A Test of the Limit, Activate, and Enhance Model

Melissa A. Day, Beverly E. Thorn, Dawn M. Ehde, John W. Burns, Amanda Barnier, Jason B. Mattingley, Natasha Matthews, and Mark P. Jensen

This study presents preliminary findings from theory-driven tests of the moderators of mindfulness meditation, cognitive therapy, and mindfulness-based cognitive therapy for chronic low back pain. The results of such analyses may inform the understanding of for whom various evidence-based psychosocial pain treatments may engender the most meaningful benefits.

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Sociodemographic and Environmental Factors are Associated with Adolescents' Pain and Longitudinal Health Outcomes

Susan T. Tran, Marissa L. Koven, Ashley S. Castro, Ana B. Goya Arce, and Jocelyn S. Carter

Adolescents with chronic pain had lower income, and more health care barriers, safety concerns, and violence exposure compared to those without chronic pain. Access to care is a significant problem in youth with chronic pain. The relationships between race/ethnicity, risk factors, and health outcomes are complex and require additional research.

182 **Inflammatory and Neuropathic Gene Expression Signatures of Chemotherapy-Induced Neuropathy Induced by Vincristine, Cisplatin, and Oxaliplatin in C57BL/6J Mice**

Hana Starobova, Alexander Mueller, Jennifer R. Deuis, David A. Carter, and Irina Vetter

These results provide insight into the recruitment of immune responses to dorsal root ganglia and indicate enhanced neuroinflammatory processes following administration of vincristine, oxaliplatin, and cisplatin. These gene expression signatures may provide insight into novel drug targets for treatment of CIPN.

195 **Parental Injustice Appraisals in the Context of Child Pain: Examining the Construct and Criterion Validity of the IEQ-Pc and IEQ-Ps.**

Fleur Baert, Megan Marie Miller, Zina Trost, Adam Todd Hirsh, Joanna McParland, Maarten De Schryver, and Tine Vervoort

This manuscript presents an examination of the construct and criterion validity of two parentally adjusted versions of the Injustice Experience Questionnaire. These measures could be valuable tools for clinicians in examining how parents respond to their child's pain as it impacts both the child's life and the parents'.

212 **Large Treatment Effect With Extended Home-Based Transcranial Direct Current Stimulation Over Dorsolateral Prefrontal Cortex in Fibromyalgia: A Proof of Concept Sham-Randomized Clinical Study**

Aline P. Brietzke, Maxciel Zortea, Fabiana Carvalho, Paulo R.S. Sanches, Danton P. Jr. Silva, Iraci Lucena da Silva Torres, Felipe Fregni, and Wolnei Caumo

These findings bring 3 important insights: 1) show that an extended period of treatment (60 sessions, to date the largest number of tDCS sessions tested) for fibromyalgia induces large pain decreases (a large effect size of 1.59) and 2) support the feasibility of home-based tDCS as a method of intervention; 3) provide additional data on DLPFC target for the treatment of fibromyalgia. Finally, our findings also highlight that brain-derived neurotrophic factor to index neuroplasticity may be a valuable predictor of the tDCS effect on pain scores decreases across the treatment.

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Assessment and Treatment Recommendations for Pediatric Pain: The Influence of Patient Race, Patient Gender, and Provider Pain-Related Attitudes

Megan M. Miller, Amy E. Williams, Tamika C.B. Zapolski, Kevin L. Rand, and Adam T. Hirsh

Providers' pain assessment (ie, pain distress/pain interference) and treatment (ie, opioids) of pediatric pain differs across patient race and to a lesser extent, patient gender. This study represents a critical step in research on pain-related disparities in pediatric pain.

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Calcium Channel $\alpha 2\delta 1$ Subunit Mediates Secondary Orofacial Hyperalgesia Through PKC-TRPA1/Gap Junction Signaling

Wen-Qiang Cui, Yu-Xia Chu, Fei Xu, Teng Chen, Lu Gao Yi Feng, Xue-Ming Hu, Wei Yang, Li-Xia Du, Wen-Wen Zhang, Qi-Liang Mao-Ying, Wen-Li Mi, and Yan-Qing Wang

This study demonstrates that the activation of Cav $\alpha 2\delta 1$ and the downstream PKC-TRPA1/GJ signaling pathway contributes greatly to trigeminal nerve injury-induced secondary mechanical and cold hyperalgesia. This suggests that inhibitors of Cav $\alpha 2\delta 1$, TRPA1, or GJs might be effective treatments for nerve injury-induced spreading of orofacial pain.

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