



On the Renaissance of Stereotactic EEG and Its Interpretation

Richard Wennberg, Lady D. Ladino, José F. Téllez-Zenteno

Can J Neurol Sci. 2018;45:256

AN INTERNATIONAL JOURNAL PUBLISHED BY THE CANADIAN NEUROLOGICAL SCIENCES FEDERATION

*The official Journal of: The Canadian Neurological Society, The Canadian Neurosurgical Society,
The Canadian Society of Clinical Neurophysiologists, The Canadian Association of Child Neurology*

MIGRAINE

**She knows
the pain.**

**We know
the science.**

We are committed to advancing
the science of migraines.

**Today, a growing understanding of CGRP*
brings new insights to the science behind
the migraine experience.¹**

 **NOVARTIS**

Novartis Pharmaceuticals Canada Inc.
Dorval, Quebec H9S 1A9
www.novartis.ca
T 514 631-6775 F 514 631-1867

For additional information, please contact Novartis med info:
Medical Information Email: medinfo.canada@novartis.com
Medical Information Toll-free Number: 1-800-363-8883

*CGRP, calcitonin gene-related peptide
© 2018 Novartis Pharmaceuticals Canada Inc. NPR/AMG/0001E

Reference: 1. Headache Classification Committee of
the International Headache Society. The International
Classification of Headache Disorders, 3rd edition
(beta version); 2013. *Cephalalgia* 33(9) 629–808.



EDITORIAL

- 255** On the Renaissance of Stereotactic EEG and Its Interpretation
Richard Wennberg, Lady D. Ladino, José F. Téllez-Zenteno

COMMENTARY

- 259** A Strategic View for Intraoperative Neuromonitoring in Canada 2017
Marshall Wilkinson, David Houlden, Sue Morris, Laura M. Holmes, Sam Strantzas

ORIGINAL ARTICLES

- 262** Next-Generation Sequencing to Diagnose Muscular Dystrophy, Rhabdomyolysis, and HyperCKemia
Lily Wu, Lauren Brady, John Shoffner, Mark A. Tarnopolsky
- 269** Three-Year Follow-Up Study in Patients with Guillain-Barré Syndrome
Vesna Martic, Ivo Bozovic, Ivana Berisavac, Ivana Basta, Stojan Peric, Milica Babic, Sonja Lukic Rajic, Bogdan Bjelica, Olivera Stojiljkovic Tamas, Aleksandar Stojanov, Marija Grunauer, Mina Cobeljic, Nenad Komatina, Vanja Djuric, Milutin Petrovic, Balsa Vujovic, Aleksandra Dominovic Kovacevic, Gordana Djordjevic, Dejana Jovanovic, Zorica Stevic
- 275** Is Concussion a Risk Factor for Epilepsy?
Richard Wennberg, Carmen Hiploylee, Peter Tai, Charles H. Tator
- 283** Knowledge, Attitudes and Concussion Information Sources Among First Nations in Ontario
Cindy Hunt, Alicja Michalak, Elaine Johnston, Chrissy Lefkimiatis, Leila Macumber, Tony Jocko, Donna Ouchterlony
- 290** Outcomes in Hospitalized Ischemic Stroke Patients with Dementia on Admission: A Population-Based Cohort Study
Charlotte Zerna, Mary P. Lindsay, Jiming Fang, Richard H. Swartz, Eric E. Smith

- 295** Establishing the Incidence and Prevalence of Multiple Sclerosis in Saskatchewan
Lina H. Al-Sakran, Ruth Ann Marrie, David F. Blackburn, Katherine B. Knox, Charity D. Evans
- 304** Toward a Shared-Care Model of Relapsing-Remitting Multiple Sclerosis: Role of the Primary Care Practitioner
Jiwon Oh, Marie-Sarah Gagné-Brosseau, Melanie Guenette, Catherine Larochelle, François Lemieux, Suresh Menon, Sarah A. Morrow, Laurence Poliquin-Lasnier, Chantal Roy-Hewitson, Carolina Rush, Anne-Marie Trudelle, Paul S. Giacomini
- 313** Effect of Cerebral Perfusion Pressure on Acute Respiratory Distress Syndrome
Sonny Thiara, Donald E. Griesdale, William R. Henderson, Mypinder S. Sekhon
- 320** Evaluation of an Ophthalmoscopy Simulator to Teach Funduscopy Skills to Pediatric Residents
Elizabeth Kouzmitcheva, Stephanie A. Grover, Tara Berenbaum, Asim Ali, Adelle Atkinson, E. Ann Yeh
- 325** Effect of Combination Therapy with Neuroprotective and Vasoprotective Agents on Cerebral Ischemia
Jiping Yang, Bei Yang, Baoxin Xiu, Jinchong Qi, Huaijun Liu

NEUROIMAGING HIGHLIGHTS

- 332** MRI and Tractography in Hypertrophic Olivary Degeneration
Qilun Lai, Chaobo Zheng, Rui Zhang, Xiaoli Liu, Yaguo Li, Qi Xu
- 334** Subacute Combined Degeneration from Nitrous Oxide Abuse in a Patient with Pernicious Anemia
Dustin Anderson, Grayson Beecher, Rene van Dijk, Mohammed Hussain, Zaeem Siddiqi, Fang Ba

BRIEF COMMUNICATIONS

- 336** Intracranial Electroencephalographic Monitoring: From Subdural to Depth Electrodes
Holger Joswig, David A. Steven, Andrew G. Parrent, Keith W. MacDougall, Seyed M. Mirsattari, Richard S. McLachlan, David C. Diosy, Jorge G. Burneo
- 339** Defining CT Perfusion Thresholds for Infarction in the Golden Hour and With Ultra-Early Reperfusion
Mohamed Najm, Fahad S. Al-Ajlan, Mari E. Boesen, Lisa Hur, Chi Kyung Kim, Enrico Fainardi, Michael D. Hill, Andrew M. Demchuk, Mayank Goyal, Ting Y. Lee, Bijoy K. Menon
- 343** Pulmonary Embolism in Ischemic Stroke
Prasanna Venkatesan Eswaradass, Sadanand Dey, Dilip Singh, Michael D. Hill
- 346** Laboratory Abnormalities in Polyneuropathy and Electrophysiological Correlations
Alon Abraham, Ari Breiner, Carolina Barnett, Hans D. Katzberg, Mylan Ngo, Leif E. Lovblom, Bruce A. Perkins, Vera Bril

REFLECTIONS

- 350** A Tribute to Doctors by Robert Louis Stevenson
Charles F. Bolton

LETTERS TO THE EDITOR

- 351** Headache and Papilledema in Guillain-Barré Syndrome
Anas Alrohimi, Fang Ba
- 354** Dissociation of Spinothalamic Modalities Following Anterolateral Cordotomy
Manohar L. Sharma, Kate Marley, Francis P. McGlone, Manish Gupta, Andrew G. Marshall
- 357** Spontaneous Intracranial Hypotension as a Cause of Exacerbation in Huntington's Disease
Enriqueta Lúcar Figueroa, Mandar S. Jog, David M. Pelz, Stephen P. Lownie
- 360** Focal Cortical Dysplasia Type IIIb with Oligodendroglioma in a Seizure-Free Patient
Mark A. MacLean, Alexander S. Easton, Gwynedd E. Pickett

ERRATA

- 363** Pharmacists as Care Providers for Stroke Patients: A Systematic Review – ERRATUM
Jade E. Basaraba, Michelle Picard, Kirsten George-Phillips, Tania Mysak
- 364** Headache and Papilledema in Guillain-Barré Syndrome – ERRATUM
Anas Alrohimi, Fang Ba

Editor-in-Chief/Rédacteur en chef

Robert Chen TORONTO, ON

Associate Editors/Rédacteurs associés

Etienne De Villers-Sidani MONTREAL, QC
Robert Hammond LONDON, ON
Hans Katzberg TORONTO, ON
Mahendranath Moharir TORONTO, ON
Tejas Sankar EDMONTON, AB
Manas Sharma LONDON, ON
Jeanne Teitelbaum MONTREAL, QC

Past Editors/Anciens rédacteurs en chef

G. Bryan Young LONDON, ON
Douglas W. Zochodne CALGARY, AB
James A. Sharpe TORONTO, ON
Robert G. Lee CALGARY, AB
Robert T. Ross WINNIPEG, MB
(Emeritus Editor, Founding Editor)

Editorial Board/Comité éditorial

Jorge Burneo, LONDON, ON
Jodie Burton, CALGARY, AB
Colin Chalk, MONTREAL, QC
K. Ming Chan, EDMONTON, AB
Alan Goodridge, ST. JOHN'S, NL
Mark Hamilton, CALGARY, AB
Michael Hill, CALGARY, AB
Alan C. Jackson, WINNIPEG, MB
Draga Jichici, HAMILTON, ON
Suneil Kalia, TORONTO, ON
Daniel Keene, OTTOWA, ON
Julia Keith, TORONTO, ON
Stephen Lownie, LONDON, ON
Jian-Qiang Lu, HAMILTON, ON

Patrick McDonald, VANCOUVER, BC
Joseph Megyesi, LONDON, ON
Tiago Mestre, OTTOWA, ON
Sarah Morrow, LONDON, ON
Michael Nicolle, LONDON, ON
Narayan Prasad, LONDON, ON
Alex Rajput, SASKATOON, SK
Kesh Reddy, HAMILTON, ON
Ramesh Sahpaul, NORTH VANCOUVER, BC
Dipanka Sarma, TORONTO, ON
Sean Symons, TORONTO, ON
Brian Toyota, VANCOUVER, BC
Brian Weinshenker, ROCHESTER, MN
Sam Wiebe, CALGARY, AB
Eugene Yu, TORONTO, ON

Journal Staff/Effectif du Journal

Dan Morin CALGARY, AB
Chief Executive Officer
Donna Irvin CALGARY, AB
*CNSF Membership Services /
Communications Officer*

**The official journal of: / La Revue
officielle de:**

**The Canadian Neurological Society
La Société Canadienne de Neurologie**

**The Canadian Neurosurgical Society
La Société Canadienne de Neurochirurgie**

**The Canadian Society of Clinical Neurophysiologists
La Société Canadienne de Neurophysiologie Clinique**

**The Canadian Association of Child Neurology
L' Association Canadienne de Neurologie Pédiatrique**

The permanent secretariat for the four societies and the Canadian Neurological Sciences Federation is at:

Le secrétariat des quatre associations et de la Fédération des sciences neurologiques du Canada est situé en permanence à :

143N – 8500 Macleod Trail SE
Calgary, Alberta T2H 2N1 Canada
CNSF (403) 229-9544 / CJNS (403) 229-9575
Fax (403) 229-1661

The Canadian Journal of Neurological Sciences is published bi-monthly. The annual subscription rate for Individuals (electronic) is £134/\$221. The annual subscription rate for Institutions (electronic) is £178/\$296. See <cambridge.org/cjn> for full details including taxes; e-mail: subscriptions_newyork@cambridge.org. The Canadian Journal of Neurological Sciences is included in the Cambridge Core service, which can be accessed at cambridge.org/cjn. For information on other Cambridge titles, visit www.cambridge.org. For advertising rates contact M. J. Mrvica Associates, 2 West Taunton Avenue, Berlin, NJ 08009; Phone: 856-768-9360; Fax: 856-753-0064; Email: mjmrvica@mrvica.com.

Le Journal Canadien des Sciences Neurologiques est publié tous les deux mois. Le prix d'abonnement annuel pour les individus (électronique) est 134\$/221\$. Le prix d'abonnement annuel pour les établissements (électronique) est 178\$/296\$. Veuillez consulter <cambridge.org/cjn> pour tous les détails, y compris les taxes; email: subscriptions_newyork@cambridge.org. Le Journal canadien des sciences neurologiques est inclus dans le service Cambridge Journals Online, accessible à cambridge.org/cjn. Pour plus d'informations sur les titres disponible chez Cambridge, veuillez consulter www.cambridge.org. Pour les tarifs de publicité, contacter M. J. Mrvica Associates, 2 West Taunton Avenue, Berlin, NJ 08009; Téléphone: (1)856-768-9360; Email: mjmrvica@mrvica.com.

This journal is indexed by / Cette revue est indexée par:
Adis International, ArticleFirst, BIOBASE, BioLab, BioSci, BIOSIS Prev, Centre National de la Recherche Scientifique, CSA, CurAb, CurCont, De Gruyter Saur, E-psyche, EBSCO, Elsevier, EMBASE, FRANCIS, IBZ, Internationale Bibliographie der Rezensionen Geistes- und Sozialwissenschaftlicher Literatur, MEDLINE, MetaPress, National Library of Medicine, OCLC, PE&ON, Personal Alert, PsycFIRST, PsycINFO, PubMed, Reac, RefZb, SCI, SCOPUS, Thomson Reuters, TOCprem, VINITI RAN, Web of Science.

ISSN: 0317-1671
EISSN: 2057-0155

COPYRIGHT © 2018 by THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES INC. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying, or otherwise, without permission in writing from Cambridge University Press. Policies, request forms and contacts are available at: <http://www.cambridge.org/about-us/rights-permissions>. Permission to copy (for users in the U.S.A.) is available from Copyright Clearance Center: <http://www.copyright.com>, email: info@copyright.com.

COPYRIGHT © 2018 du THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES INC. Tous droits réservés. Aucune partie de cette publication ne peut être reproduite, sous quelque forme ou par quelque procédé que ce soit, électronique ou autre, y compris la photocopie, sans l'accord écrit de Cambridge University Press. Les politiques, les formulaires de demande et les contacts sont disponibles à: <http://www.cambridge.org/about-us/rights-permissions>. La permission de copier (pour les utilisateurs aux États-Unis) est disponible auprès Copyright Clearance Center: <http://www.copyright.com>, email: info@copyright.com.

CNSF 53rd CONGRESS

June 24 – 27, 2018 | Halifax, NS



The Canadian Neurological Sciences Federation hosts an annual Canadian Congress with four days of accredited scientific courses to assist our members, and others, with their Continuing Professional Development and Maintenance of Certification.

This is a collegial meeting providing multidisciplinary courses relevant to all neuroscience specialties.

HIGHLIGHTS:

- 4 full days of **accredited** sessions.
- **Diverse program and courses of interest** for members of all neuroscience specialties.
- Excellent speakers including our special **Grand Plenary Speakers**: Dr. Jean Raymond, Dr. Mark S. Freedman, Dr. Robert S. Fisher, Prof. Thomas Opladen and Dr. Wouter I. Schievink.
- We offer **Lunch 'n Learns** and **co-developed sessions** to expand on specific topics of interest. This year features sessions on Treatment Options for Migraine Prevention, Innovative Surgical Treatment of Movement Disorders, MS from Pediatric Data to SPMS, SUDEP in Epilepsy and Navigation Technology.
- CNSF has **room blocks** at multiple Halifax locations to suit all of our delegates.

For more information
& program details visit: congress.cnsfederation.org



Chair/Chief, Department of Clinical Neurological Sciences

The Schulich School of Medicine & Dentistry at Western University, London Health Sciences Centre and St. Joseph's Health Care London are seeking a Chair/Chief for the Department of Clinical Neurological Sciences. Together, the hospitals provide comprehensive care to a large and geographically extended population of approximately 2.5 million people across Southwestern Ontario. The Schulich School of Medicine & Dentistry has a long tradition of excellence, beginning with the founding of the medical school in 1878, and the dental school in 1964.

The city wide Chair/Chief leads the Department of Clinical Neurological Sciences – a department that provides integral support to all of the clinical campuses of St. Joseph's Health Care London and London Health Sciences Centre. The department is formed by the divisions of Neurology and Neurosurgery. There are currently 30 neurologists, 12 neurosurgeons, and 49 residents and fellows in the different neurology and neurosurgery sub-specialties, who provide a comprehensive array of clinical inpatient and ambulatory services, in modern facilities with over 1000 admissions annually. Strengths include the renowned Epilepsy Programme and Neuromuscular group, and extensive collaboration with the Robarts Research Institute, particularly in neuroimaging and basic science research. Graduate and undergraduate teaching is also a major focus of the department. The department wishes to further grow and strengthen its major focus in the area of stroke and cerebrovascular research.

The new Chair/Chief will be an exceptional leader with a vision of how to advance the Department of Clinical Neurological Sciences within the clinical, teaching, and research strengths of the Department and the evolving health care system. He/she must have a strong record of clinical service, quality improvement, and leadership in both clinical and academic activities. Furthermore, the successful candidate will have demonstrated competency in scholarship and the vision to expand the strengths of integrated clinical, teaching and research programs of the department. He/she will be an excellent communicator, able to advocate for the departmental mission and goals to its partners and to the community.

The successful candidate will hold an M.D or equivalent and be certified or eligible to be certified as a member of the Royal College of Physicians and Surgeons of Canada within the specialty of neurology or neurosurgery and be eligible for licensure in the Province of Ontario. Compensation will be based on qualifications and experience and will be composed primarily of the following sources: fee for service, alternate funding plan and academic support. The successful candidate will hold a full-time Limited Term Clinical Academic appointment at the rank of Associate Professor, or a Continuing Clinical Academic appointment at the rank of Associate Professor or Professor, depending upon qualifications and experience. This appointment is for a five year period, normally renewable once upon satisfactory review.

Western University is located in London, Ontario, with a metropolitan census of 530,000 but a referral base that draws from approximately (2.5 million) including adjacent areas of Southwestern Ontario. London boasts an extensive educational and health care community including two large teaching hospitals with multiple sites, two research institutes, an ICES (Institute for Clinical Evaluative Sciences) node, and an academic health sciences network across Southwestern Ontario. With full time enrollment of 32,000, Western University graduates students from a range of academic and professional programs. Details about Western University's Schulich School of Medicine & Dentistry may be found at www.schulich.uwo.ca; Western University at <http://www.uwo.ca/>; the Department of Clinical Neurological Sciences at www.schulich.uwo.ca/cns/; London Health Sciences Centre at www.lhsc.on.ca/; and St. Joseph's Health Care at www.sjhc.london.on.ca/.

Interested candidates should submit an application including a letter of interest, curriculum vitae, names and addresses of three references. In addition, please ensure that the form available at: http://uwo.ca/facultyrelations/physicians/Application_FullTime_Clinical.pdf is included with your application to:

Dr. James Calvin, Chair/Chief, Department of Medicine &
Dr. Robin Walker, Integrated Vice President of Medical Affairs and Medical Education
Schulich School of Medicine & Dentistry, Western University
London, Ontario N6A 5C1, FAX: (519) 850-2357; selection.committee@schulich.uwo.ca

Applications will be accepted until the position is filled. Review of applicants will begin after March 31, 2018. Anticipated start date is to be negotiated.

Business Addresses:

Western University, 1151 Richmond Street, N., London, Ontario N6A 5B8, www.uwo.ca
London Health Sciences Centre, 800 Commissioners Road E., London Ontario, N6A 5W9, www.lhsc.on.ca/
St. Joseph's Health Care London, 268 Grosvenor Street, London Ontario, N6A 4V2, www.sjhc.london.on.ca

Positions are subject to budget approval. Applicants should have fluent written and oral communication skills in English. The University invites applications from all qualified individuals. Western is committed to employment equity and diversity in the workplace and welcomes applications from women, members of racialized groups/visible minorities, Aboriginal persons, persons with disabilities, persons of any sexual orientation, and persons of any gender identity or gender expression.

In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents.

Accommodations are available for applicants with disabilities throughout the recruitment process. If you require accommodations for interviews or other meetings, please contact Brigitte Neale at Brigitte.Neale@Schulich.uwo.ca phone 519-661-2111 ext. 82698.