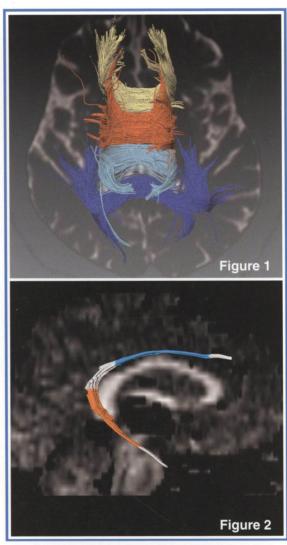


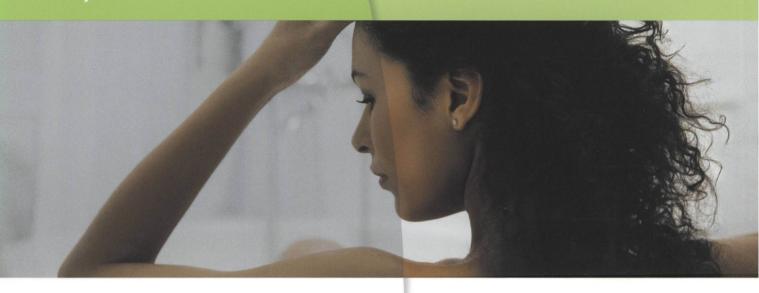
Volume 37 Number 5 September 2010



See Page A-2 for figure legend

Beyond whole brain

there's local control

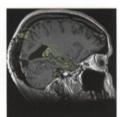


Leksell Gamma Knife® Perfexion™ treats

multiple brain metastases in a single session, reducing the damage to healthy tissue that may limit future treatment options, and allowing for concomitant chemotherapy for optimum primary tumor control. Find out how Elekta is creating new possibilities for the most challenging cases at elekta.com/proof.



Leksell Gamma Knife® Perfexion®



Single-session multiple mets





Volume 37 / Number 5 / September 2010

EDITORIALS

- **549** Can Screening Prevent Poor Outcomes Following Blunt Cerebrovascular Injury?
 - Cian J. O'Kelly
- 551 Brain, Cognition and MRI in MS: An Ongoing Refinement Process
 - Céline Jobin, Pierre Duquette
- 553 Migraine in Canada...We Can and Should do Better Jonathan Gladstone, Paul E. Cooper
- **555** A Comment on the Role of Environmental Factors in Parkinson's Disease

Shawn Hayley

HISTORICAL REVIEW

557 Julius Caesar's Late Onset Epilepsy: A Case of Historic Proportions

Richard S. McLachlan

AUTOBIOGRAPHY

562 My Front Row Seat - Further Encounters at the Greatest Show on Earth

Henry J.M. Barnett

ORIGINAL ARTICLES

- 568 Carotid Stenting in Asymptomatic Carotid Stenosis: The Calgary Experience
 - N. Shobha, M.A. Almekhlafi, A. Pandya, P.L. Couillard, W.F. Morrish, J.H. Wong, M.D. Hill
- 574 Blunt Cerebrovascular Injuries: Diagnosis and Management Outcomes
 - Corie W. Wei, Walter Montanera, Daniel Selchen, Jackie Lian, Christopher Stevens, Lyne Noël de Tilly
- 580 Migraine Prevalence, Treatment and Impact: The Canadian Women and Migraine Study
 - Lara J. Cooke, Werner J. Becker

- 588 Botulinum Toxin Type A and Acute Drug Costs in Migraine with Triptan Overuse
 - Suzanne N. Christie, Rose Giammarco, Marek Gawel, Gordon Mackie, Jonathan Gladstone, Werner J. Becker
- 595 Corpus Callosum and Cingulum Tractography in Parkinson's Disease
 - Katie Wiltshire, Luis Concha, Myrlene Gee, Thomas Bouchard, Christian Beaulieu, Richard Camicioli
- **601** Prevalence of Primitive Reflexes and Parkinsonian Signs in Dementia
 - K.A. Links, D. Merims, M.A. Binns, M. Freedman, T.W. Chow
- 608 Diffusion Tensor Imaging Abnormalities in Cognitively Impaired Multiple Sclerosis Patients
 - Nadine Akbar, Nancy J. Lobaugh, Paul O'Connor, Linda Moradzadeh, Christopher J.M. Scott, Anthony Feinstein
- **615** Corpus Callosum Volume and Interhemispheric Transfer in Multiple Sclerosis
 - L.N. Brown, Y. Zhang, J.R. Mitchell, R. Zabad, L.M. Metz
- 620 Sources of Error in Neuropathology Intraoperative Diagnosis

 Matthew Meyer, Julia Keith-Rokosh, Hasini Reddy,
 Joseph Megyesi, Robert R. Hammond
- **625** Clinical Significance of Molecular Biomarkers in Glioblastoma
 - C. Ang, M.-C. Guiot, A.V. Ramanakumar, D. Roberge, P. Kavan
- 631 Long-Term Efficacy of Botulinum A Toxin for Blepharospasm and Hemifacial Spasm
 - Harmeet S. Gill, Stephen P. Kraft
- 637 Environmental and Familial Risk Factors of Parkinsons Disease: Case-Control Study
 - Jaya Sanyal, D.P. Chakraborty, Biswanath Sarkar, Tapas Kumar Banerjee, Subhash Chandra Mukherjee, Bidhan Chandra Ray, V.R. Rao
- 643 Nestin, A New Marker, Expressed in Müller Cells Following Retinal Injury
 - Liping Xue, Peng Ding, Libo Xiao, Min Hu, Zhulin Hu
- **650** Use of Tissue Glues in Endoscopic Pituitary Surgery: A Cost Comparison
 - Lukas H. Kus, Brian W. Rotenberg, Neil Duggal



Volume 37 / Number 5 / September 2010

- 656 The Significance of Frontal Intermittent Rhythmic Delta Activity in Children
 - Shay Menascu, Ismail Mohamed, Shany M. Tshechmer, Manohar Shroff, Miguel A. Cortez
- 662 Third Nerve Palsy: Analysis of 1400 Personally-examined Inpatients
 - James R. Keane
- **671** Scedosporium Cerebral Abscesses After Extra-Corporeal Membrane Oxygenation
 - Hosam Al-Jehani, Marie-Christine Guiot, Carlos Torres, Judith Marcoux

NEUROIMAGING HIGHLIGHTS

- 677 Chordoid Glioma: Imaging Pearls of a Unique Third Ventricular Tumor
 - A. Tu, T. Yeo, D. Steinke, L. Resch, V. Mehta
- 681 Intrinsic Arteriovenous Malformation of the Trigeminal Nerve

Navneet Singh, Aditya Bharatha, Cian O'Kelly, M. Christopher Wallace, Warren Goldstein, Robert A. Willinsky, Richard I. Aviv, Sean P. Symons

BRIEF COMMUNICATIONS

- **684** Cerebral Venous Thrombosis Presenting as Subacute Parkinsonism
 - Amal Al-Hashmi, Oliver F. Nguyen, Rafael S. Glikstein, Hyman M. Schipper
- 687 Inclusion Body Myositis Masquerading as Amyotrophic Lateral Sclerosis
 - Kerri L. Schellenberg, Wendy S.W. Johnston, Sanjay Kalra, Lothar Resch, Edward S. Johnson

- 692 Extensive Stroke Associated with Tranexamic Acid Therapy
 Fernando Cabrera-Naranjo, Ayoze González-Hernández,
 Oscar Fabre-Pi, Ana Carolina López-Veloso, Santiago DíazNicolás, Alberto Cubero-González
- **694** Long-Term Survival and Late Onset Seizures in an Adolescent with Trisomy 13
 - Francois Dominique Jacob, Vijay Ramaswamy, Hanna Kolski
- 697 Pituitary Infundibulum Hemangioblastoma Detected by Dynamic Enhancement MRI
 - Yong Cao, Peiyi Gao, Shuo Wang, Jizong Zhao
- **700** Deep Cerebral Sinovenous Thrombosis Precipitated by High-Altitude Exposure
 - Muhib Khan, Angelos M. Katramados
- 703 Hirayama Disease

Jennifer Tynan, Evan Frangou, Christopher Voll, Rob Otani, Sheri Harder

REFLECTIONS

706 The Sciaticons

Mark Bernstein

707	Books Received/Books Reviewed
711	Calendar of Events
712	Congress Thank You
A-6	CNSF Sponsors
A-9/A-10	Information for Authors
A-11	Board of Directors/Committee Chairs
A-15	Advertisers Index
A-15/A-16	Classified Ads

COVER LEGEND

From the Original Article "Corpus Callosum and Cingulum Tractography in Parkinson's Disease" pages 595-600.

Figure 1: Corpus Callosum Tractography: For fibers arising in segment CC1 (anterior = yellow) only fibers projecting anteriorly and traversing the coronal slice at the most anterior point of the corpus callosum were included and fibers were excluded if they projected posterior to the traced region. For areas CC2 (anterior body = orange) and CC3 (posterior body = light blue), only fibers passing through the most superior point of the traced region on the horizontal slice were included and fibers were excluded if they projected inferiorly. For area CC4 (posterior = dark blue), fibers not projecting to the occipital or temporal lobes were excluded.

Figure 2: Cingulum Tractography. The following landmark parameters were used: 1. Body: the portion of the cingulum coursing posteriorly from the most posterior point of the rostrum to the most anterior point of the splenium (blue). 2. Posterior: the portion of the cingulum coursing inferiorly and laterally from the most superior point of the fornix to the level of the midbrain (orange). FA and MD values were calculated for fibers contained within the specified regions bilaterally.



Wider Scope, Same Commitment.

Building on our proven success in commercialising innovative neurological products, we, at Teva Canada Innovation, are now extending our expertise to other therapeutic areas.

As one of the 20 principal pharmaceutical companies in the world, our goal is to see more patients benefit from our innovative, creative and distinctly human approach to healing through pharmaceuticals.





Volume 37

Number 5

September 2010

Editor-in-Chief/Rédacteur en chef G. Bryan Young LONDON, ON

Associate Editors/Rédacteurs associés

J. Max Findlay EDMONTON, AB Michael Shevell MONTREAL, QC Timothy J. Benstead HALIFAX, NS Mike Poulter LONDON, ON Serge Gauthier VERDUN, QC Robert Hammond LONDON, ON

Past Editors/Anciens rédacteurs en chef

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/Conseil d'éditorial

Jorge Burneo London, on Richard Desbiens Quebec City, QC David Fortin Sherbrooke, QC Mark Hamilton Calgary, AB Hans-Peter Hartung Dusseldorf, Germany Michael Hill Calgary, AB Alan C. Jackson Winnipeg, MB Daniel Keene Ottawa, on Terence Myles Calgary, AB James Perry Toronto, on Oksana Suchowersky Calgary, AB Brian Toyota Vancouver, BC Brian Weinshenker Rochester, MN, USA Samuel Wiebe Calgary, AB Elaine Wirrell Rochester, MN, USA

SECTION EDITORS/CONSEIL DE RÉDACTION

Neuroimaging Highlight/Neuroimagerie

Richard Farb TORONTO, ON David Pelz LONDON, ON

Neuropathological Conference/Conférence sur la neuropathologie

Robert Hammond LONDON, ON

Book Review/Critiques de livres Reflections/Reflets

Andrew Kirk SASKATOON, SK

Critically Appraised Topic Summaries (CATS)

Jorge Burneo LONDON, ON Mary Jenkins LONDON, ON

Editorial Review Board/Conseil de Revue d'éditorial

Donald Brunet KINGSTON, ON Lionel Carmant MONTREAL, QC Colin Chalk MONTREAL, QC K. Ming Chan EDMONTON, AB Robert Chen TORONTO, ON Mary Connolly VANCOUVER, BC Joseph Dooley HALIFAX, NS Paolo Federico CALGARY, AB Daryl Fourney SASKATOON, SK Hannah Glass SAN FRANCISCO, CA, USA Alan Goodridge ST. JOHN'S, NL Ian Grant HALIFAX, NS Alan Guberman OTTAWA, ON John Hurlbert CALGARY AR Manouchehr Javidan VANCOUVER, BC Patrick McDonald WINNIPEG, MB Martin McKeown VANCOUVER, BC Joseph Megyesi LONDON, ON Vivek Mehta EDMONTON, AB Steven Miller VANCOUVER, BC Neelan Pillay CALGARY, AB Christopher Power EDMONTON, AB Alex Rajput SASKATOON, SK Jean Raymond MONTREAL, QC Gary Redekop VANCOUVER, BC Mark Sadler HALIFAX, NS Harvey Sarnat CALGARY, AB John Stewart VANCOUVER, BC Jeanne Teitelbaum MONTREAL, QC Eve Tsai OTTAWA, ON Shannon Venance LONDON, ON Matt Wheatley EDMONTON, AB Jerome Yager EDMONTON, AB

Journal Staff - Calgary, AB

Dan Morin, Chief Executive Officer
Maggie McCallion, Designer/
Production Coordinator
Cindy Leschyshyn, Editorial Coordinator

Advertising representative/Représentant de publicité:

Brett Windle

Corporate Development Coordinator Tel (403) 229-9575 Fax (403) 229-1661 E-mail: brett-windle@cnsfederation.org

Printer/Imprimeur:

Unicom Graphics, 4501 Manitoba Road SE Calgary, Alberta T2G 4B9 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 du Fédération des sciences neurologiques du Canada est situe en permanence à:

> 7015 Macleod Trail SW, Suite 709 Calgary, Alberta, Canada T2H 2K6

The Canadian Journal of Neurological Sciences is published bimonthly. The annual subscription rate for Individuals are: C\$120 (Canada), C\$140 (Foreign including USA). Subscription rates for Institutions are: C\$150 (Canada), C\$170 (Foreign including USA). See www.cjns.org for details. Single copies C\$30 each plus postage and handling. Communications should be sent to: Canadian Journal of Neurological Sciences, 709 - 7015 Macleod Trail SW, Calgary, AB Canada T2H 2K6. Telephone (403) 229-9575; Fax (403) 229-1661. E-mail: journal@cjns.org; Web: www.cjns.org COPYRIGHT© 2010 by THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES INC. All rights reserved. No part of this journal may be reproduced in any form without the prior permission of The Canadian Journal of Neurological Sciences. Postage paid at Calgary, Alberta.

Le Journal Canadien des Sciences Neurologiques est publié 6 fois par an. L'abonnement annuel est de 120 \$C (non-membres au Canada); 140 \$C (Etats Unis et ailleurs); l'abonnement annuel for pour les institutions est de 150 \$C (non-membres au Canada); 170 \$C (Etats Unis et ailleurs); Voir www.cjns.org pour détails. Copie simple: 30 \$C plus affranchissement et manutention. Toutes les communications doivent être adressés à Journal Canadien des Sciences Neurologiques, 709 - 7015 Macleod Trail \$W, Calgary, AB Canada T2H 2K6. Téléphone (403) 229-9575; Fax (403) 229-1661. E-mail journal@cjns.org; Web:www.cjns.org. DROITS D'AUTEUR© 2010: THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES INC. Tous droits réservés. Aucune partie de ce Journal ne peut être reproduite, sous quelque forme que ce soit, sans la l'authorisation du Journal Canadien des Sciences Neurologiques. Port payé à Calgary, Alberta.

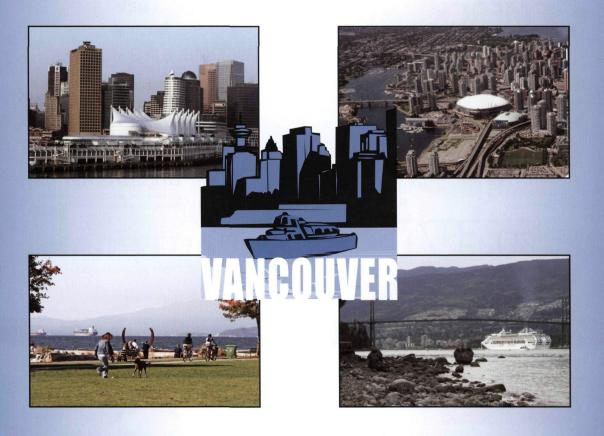
This journal is indexed by / Cette Journal est cité et indexé dans: AgBio, BIOBASE, BiolAb, BIOSIS Prev, CABS, ChemAb, CSA, CurAb, CurCont, E-psyche, EBSCO, Elsevier, EMBASE, ExcerpMed, BZ, Index Medicus, Index to Dental Literature, Index to Scientific Reviews, Inpharma, Internationale Bibliographie der Rezensionen Geistes-und Sozialwissenschaftlicher Literatur, JW-N, MEDLINE, MetaPress, MycolAb, NRN, NSCI, PE&ON, Personal Alert, PsycFIRST, PsycInfo, Psychological Abstracts, PubMed, Reac, RefZh, SCI, SCOPUS, Swets, TOCprem, Web of Science ADVERTISING.

ISSN 0317 - 1671



Thank you delegates for joining us at this years Congress in Zuebec city!

We look forward to seeing you at our 2011 Congress in Vancouver, British Columbia!



Surrounded by water on three sides and nestled alongside the Coast Mountain Range, Vancouver is the largest city in the province of British Columbia with over half a million residents and one of the mildest climates in Canada. Home to spectacular natural scenery and a bustling metropolitan core, Vancouver was Host City to the Olympic and Paralympic Winter Games in 2010. Whether just relaxing in a park or bike riding around the seawall, there is always something to do in Vancouver.

Canadian Neurological Sciences Federation Annual Congress June 14 - 17, 2011

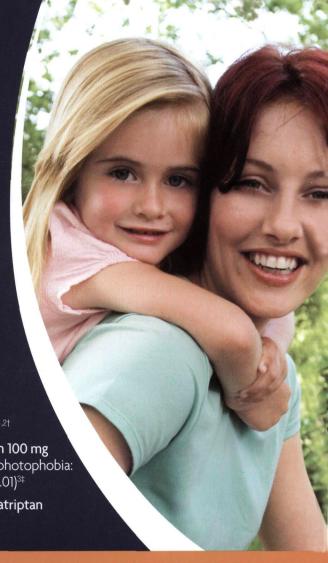


Choose NE migraine therapy that has demonstrated rapid, reliable relief. 1-4118

 Demonstrated headache response as quickly as 30 minutes postdose vs. placebo (RELPAX 40 mg: 9%; placebo: 4%, p<0.05)^{1,2†}

 Provided greater relief of associated symptoms vs. sumatriptan 100 mg at 2 hours (absence of nausea: 74% vs. 67%, p<0.01; absence of photophobia: 71% vs. 63%, *p*<0.01; absence of phonophobia: 74% vs. 67%, *p*<0.01)³⁴

• Demonstrated superior functional response at 2 hours vs. sumatriptan 100 mg (68% vs. 61%, p<0.01; 63% vs. 46%, p<0.005)^{3,4§§}



RELPAX is indicated for the acute treatment of migraine with or without aura in adults. RELPAX tablets are not intended for the prophylactic therapy of migraine or for use in the management of hemiplegic, ophthalmoplegic or basilar migraine. Safety and effectiveness of RELPAX tablets have not been established for cluster headache, which is present in an older, predominantly male population. Among 5984 patients who treated a single migraine headache with RELPAX 20 mg, 40 mg or 80 mg tablets in short-term, placebo-controlled trials, the most common and dose-related adverse events reported with treatment with RELPAX were asthenia (7.2%), nausea (7.8%), dizziness (5.7%) and somnolence (5.2%). RELPAX 80 mg is not an available dose. The maximum daily dose is 40 mg.

RELPAX is contraindicated in patients with history, symptoms, or signs of ischemic cardiac, cerebrovascular or peripheral vascular syndromes, valvular heart disease or cardiac arrhythmias (especially tachycardias). In addition, patients with other significant underlying cardiovascular diseases (e.g., atherosclerotic disease, congenital heart disease) or uncontrolled or severe hypertension should not receive RELPAX. Ischemic cardiac syndromes include, but are not restricted to, angina pectoris of any type (e.g., stable angina of effort and vasospastic forms of angina such as Prinzmetal's variant), all forms of myocardial infarction, and silent myocardial ischemia. Cerebrovascular syndromes include, but are not limited to, strokes of any type as well as transient ischemic attacks (TIAs). Peripheral vascular disease includes, but is not limited to, ischemic bowel disease, or Raynaud's syndrome. Because RELPAX may increase blood pressure it is contraindicated in patients with uncontrolled or severe hypertension. RELPAX is contraindicated within 72 hours of treatment with potent CYP3A4 inhibitors (i.e., ketoconazole, itraconazole, nefazodone, troleandomycin, clarithromycin, ritonavir, and nelfinavir). RELPAX is contraindicated within 72 hours with drugs that have demonstrated potent CYP3A4 inhibition and have this potent effect described in the CONTRAINDICATIONS, or WARNINGS AND PRECAUTIONS sections of their labelling, RELPAX is contraindicated within 24 hours of treatment with another 5-HT, agonist, an ergotamine-containing or ergot-type medication such as dihydroergotamine (DHE) or methysergide. RELPAX is contraindicated in patients with hemiplegic, ophthalmoplegic or basilar migraine, patients with severe hepatic impairment, and those with known hypersensitivity to eletriptan or to any of its inactive ingredients.

- † In a multicentre, double-blind, placebo-controlled, parallel-group clinical trial, 1334 outpatients with a diagnosis of migraine were randomized to receive RELPAX 20 mg, 40 mg, or 80 mg, or 90 mg, or 100 mg, attacks. The efficacy, consistency, tolerability and safety of RELPAX were evaluated.
- ‡ In a randomized, double-blind, double-dummy, parallel-group study conducted in 2113 patients with a diagnosis of migraine. Subjects were randomized to receive RELPAX 40 mg, sumatriptan 100 mg or placebo for the treatment
- § In a randomized, double-blind, double-dummy, placebo-controlled study conducted in 1008 patients with a history of migraine. Subjects were randomized to receive RELPAX 40 mg or 80 mg, sumatriptan 50 mg or 100 mg, or placebo to treat up to 3 migraine attacks.

For complete prescribing information, please refer to the Product Monograph. The Product Monograph is available upon request.



TM Pfizer Inc. used under license RELPAX® Pfizer Products Inc., owner/Pfizer Canada Inc., licensee © 2010 Pfizer Canada Inc., Kirkland, Quebec H9J 2M5



Working together for a healthier world"





ADVERTORIAL

First the plan, then the portfolio

A portfolio is part of a financial plan, not the other way around.

I talk to a variety of people during the week—clients, potential clients, friends and family. Most (if not all) of these people have investment portfolios. But with the exception of my clients, very few of them have financial plans.

There's a big difference between a portfolio and a plan. A portfolio is a collection of investments, gathered together in an account with little regard for long-term strategy. A plan, on the other hand, is all about strategy. It is a detailed roadmap for achieving financial goals within a given time frame. In this way, an investment portfolio serves the financial plan. Not the other way around.

Quite frankly, I see too many people make investment decisions in a vacuum—without looking at the "big picture." What are you trying to accomplish? What's the end goal of investing in XYZ stock? Too often these questions are ignored, and a stock is bought simply because its share price seems to be going up. The result is a hodge-podge of investments that performs poorly, and often forces the investor to take on a lot more risk than is necessary. That can leave the investor frustrated and anxious at the inability to attain financial goals. Which can lead to riskier and riskier investments. And so the cycle continues.

It doesn't have to be this way. If you have an investment portfolio, that's a good start. But you need a financial plan as well. Here are three things a financial plan can do for you.

Fills in the big picture

A financial plan gives you a rationale that you can apply to investment decisions. For example, if you're faced with an investment opportunity, and you don't know whether you should take it or not, simply review your financial plan and ask yourself: "does this investment bring me closer to my goals? Does this investment fit into the big picture? Does it fit in with my stated risk tolerance?" If you can answer yes to all three, then the investment is worth considering. If not, you move on.

Offers discipline

A financial plan strengthens your commitment to financial goals. It encourages you to take profits and to accept losses when it makes sense to do so. It serves as a "reality check" when you hear hot tips, and prevents you from overconcentrating the portfolio in a single stock or market sector. This alone can do a lot to protect your financial future.

Offers peace of mind

A financial plan helps you sleep at night. When you know where you're going (and why you're taking a particular route to get there), you feel more confident about the future. A well-written financial plan takes market volatility into account, and can provide you with direction in good markets and bad—that can be very valuable in times of volatility. But it's not just about the market. Life can be uncertain too. A financial plan can account for unexpected circumstances in your life—if you become disabled, for example. You'll sleep better because you'll know that no matter what happens, your plan is working to achieve your long-term goals.

Talk to your financial professional about writing a financial plan today. Contrary to popular belief, writing a financial plan doesn't have to be difficult. All it takes is a little commitment. And when you see others who don't have a plan anxious and stressed about not meeting their financial goals, you'll understand just how valuable a financial plan can be.

Visit www.scotiamcleod.com or talk to your Scotiabank Small Business advisor at your local branch.

Scotia Professional Plan



This publication has been prepared by ScotiaMcLeod, a division of Scotia Capital Inc (SCI), a member of CIPF. This publication is intended as a general source of information and should not be considered as personal investment, tax or pension advice. We are not tax advisors and we recommend that individuals consult with their professional tax advisor before taking any action based upon the information found in this publication. This publication and all the information, opinions and conclusions contained in it be referred to without in each case the prior express consent of SCI. Scotiabank Group refers to The Bark of Nova Scotia and its domestic subsidiaries. @ Registered trademark of The Bark of Nova Scotia well and its domestic subsidiaries. Begistered trademark of The Bark of Nova Scotia and its domestic subsidiaries. The Bark of Nova Scotia and its domestic subsidiaries.