

NeuroMatters

Connecting YOU to the Research

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Ontario Neurotrauma Foundation
Fondation ontarienne de neurotraumatologie

The View from the Summit

Mild Traumatic Brain Injury in Ontario

The Ontario Neurotrauma Foundation (ONF) wants to improve outcomes for people with mild Traumatic Brain Injury (mTBI), particularly for those people who do not recover as expected. ONF recognizes that success is dependent upon a coordinated strategy best achieved in partnership with other organizations and sectors. With this in mind, ONF along with some of its partners convened a summit this past April, inviting key stakeholders to discuss the development of a province-wide mTBI strategy. The overwhelming response indicated that the time was ripe for a coordinated approach to address mTBI in Ontario.

Sixty representatives from diverse organizations and sectors gathered at the Summit to discuss a provincial mTBI strategy. The list included broad representation from healthcare, medical and rehabilitation fields, but also government, consumer organizations, education, insurance, workplace injury and legal sectors, sports and the military.

Margaret Weiser, President of the Ontario Psychological Association and one of the Summit participants, said "I was thrilled to see the universal recognition among such a wide range of participants that mTBI is a significant problem."

Alicja Michalak, Case Manager and Clinical Nurse Specialist at the Head Injury Clinic at St. Michael's Hospital agreed. "I was very impressed with the number of different organizations involved in the Summit. Their huge commitment was fabulous." Of the 1,500

patients seen annually at the Head Injury Clinic, Michalak estimates that 70% are people with mTBI.

From the Summit, a framework was created for a coordinated Provincial mTBI Strategy that reaches across many sectors and targets recognition, diagnosis, and

management of mTBI. The idea was to identify priority areas to enhance professional and service provider approaches for mTBI. Part of the framework is also focused on increasing awareness and education among healthcare professionals, other sectors and

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members of the public. “We want to help establish Ontario as an international leader in addressing the treatment of complications associated with mTBI,” said Mark Bayley, Chair of the mTBI Strategy Coordinating Committee, “but more importantly we want to improve outcomes of mTBI.”

Estimates vary for the incidence rate of mTBI but everyone agrees that the real numbers aren't known since a large proportion of cases go unreported. A recent study of mTBI put the figure for new cases in Ontario at 60,000 per year.

The majority of brain injuries, 80-95%, are classified as mild. The good news is that most people seem to have a full recovery within weeks to three months with appropriate medical guidance and a careful return to activities. The bad news is that 10-15% of people who sustain an mTBI experience longer term symptoms that affect daily life and function and in some cases, the symptoms do not fully resolve. Given current estimates, that's an additional 9,000 people in Ontario each year who do not recover from mTBI as expected and who live with persisting symptoms.

“I was thrilled to see the universal recognition among such a wide range of participants that mTBI is a significant problem”

Mild Traumatic Brain Injury (mTBI) can be difficult to diagnose since it is usually not visible on a CT scan or MRI. If the individual does not lose consciousness, or does so only for a few minutes and then appears to be okay, the potential seriousness of the injury can be overlooked, especially if another injury is also present that requires immediate medical attention.

Things get further complicated because not everyone who sustains an mTBI seeks medical attention and thus the injury can go unrecognized, undiagnosed and untreated.

Referring to the difficulty of diagnosing a brain injury months or even years after a head trauma, Weiser said, “The brain injury itself can become the obstacle to care. People can be wobbly on their feet, speak with a slur, be irritable towards friends and family, and have difficulty following conversation. Anxiety, social withdrawal, and depression can make it very difficult to ask for the care they need: mTBI can become an insidious and invisible disability.”

The Summit participants identified five priority areas and divided into Working Groups to begin developing a coordinated action plan to achieve the Strategy goals. The five Working Groups are:

- Recognition and awareness of mTBI
- Diagnosis and early education of patient and family
- Access to care and timely intervention
- Management of persistent symptoms
- Psycho-social issues and reintegration.

“The best possible outcome of the Summit would be that mTBI become recognized as a significant cause of disability that impacts all ages.”

Some of the ideas under discussion as a result of the Summit include the development of consistent messages to provide to people who sustain an injury and to their families about what an mTBI is and what to expect. Other ideas being considered include how to better inform education professionals to be aware of what supports children might need in returning to school, and putting guidelines in place to assist family physicians to treat and coordinate the care of people who are not recovering as expected after mTBI.

Michalak said, “The best possible outcome of the Summit would be that mTBI become recognized as a significant cause of disability that impacts all ages.” She added that early diagnosis has been shown to improve outcomes, so she'd like to see the focus on better diagnostic tools and better recognition of symptoms among the general population.

Please see “It's All in the Head: a concussion is a brain injury” in this issue for more on mTBI and watch for news of further initiatives of the mTBI Provincial Strategy in upcoming issues of *NeuroMatters*.

The Role of Rehabilitation in Primary Health Care

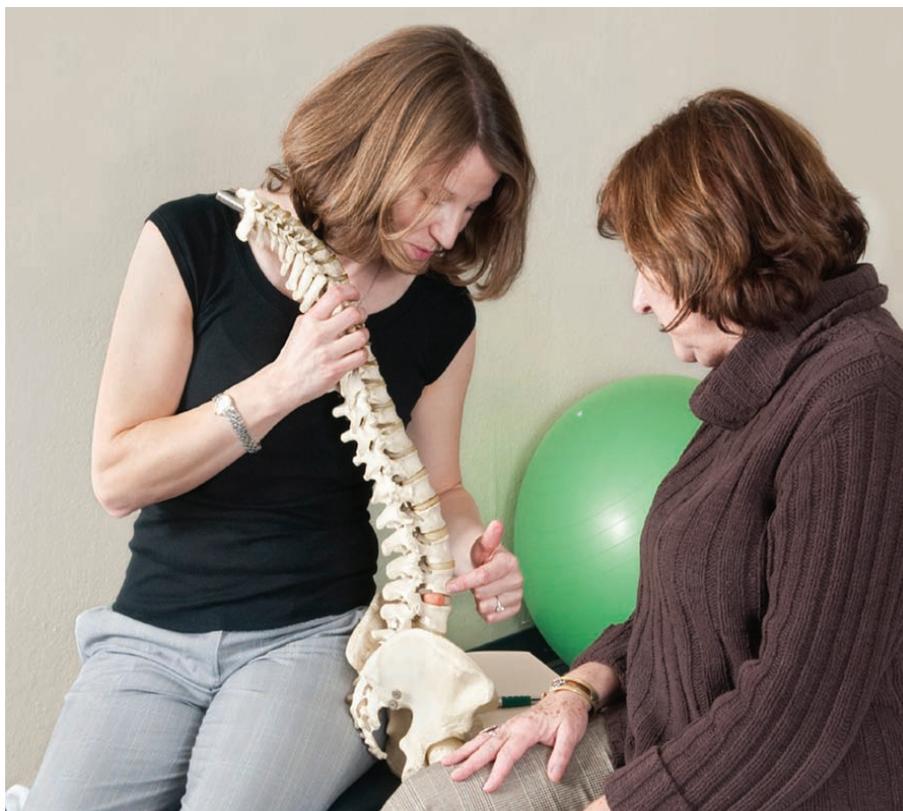
Rehabilitation is an ongoing process for individuals with SCI even once they return home after inpatient rehabilitation. With the development of family health teams to deliver primary care in Ontario, understanding the role of rehabilitation professionals on such teams is crucial to ensure the provision of comprehensive healthcare.



According to Health Canada, primary care is the first level of contact with the health system. It is at this level that services are mobilized and coordinated to promote health, prevent illness, and manage chronic disease.

The Ontario Neurotrauma Foundation (ONF) wanted to explore the role of physiotherapists and occupational therapists in the provision of primary health care. ONF funded a research project designed to canvass how these rehabilitation professionals are integrated into primary health care provision in Canada as well as in a number of other countries.

The study, led by Julie Richardson, Associate Professor in the School of Rehabilitation Science at McMaster University, provided a broad survey of rehabilitation models in use both nationally and internationally. The purpose, in part, was to explore options for the successful integration of rehabilitation into primary care in Ontario by trying to



learn from existing practices, to see what was working and what wasn't.

The scope of the study was far reaching, examining programs in diverse regions in each province and territory in Canada as well as in twelve additional countries including the United States, the United Kingdom, the Scandinavian countries, Australia and New Zealand. The study focused on physiotherapy and occupational therapy in a wide array of settings addressing a number of health concerns including diabetes, arthritis, spinal cord injuries, multiple sclerosis and muscular dystrophy.

One of the many models for rehabilitation for people with SCI highlighted a program based in Spokane, Washington USA. After being discharged from a rehabilitation hospital, people with SCI in this program are given equipment, including a small monitor and camcorder, to allow them to videoconference, via a phone line, with therapists at the

rehabilitation hospital in Spokane. This service allows for the physiotherapists at the rehab hospital to assist physiotherapists in rural communities, many of whom have not had extensive experience working with people with SCI. The service supports continued rehabilitation in the home environment to assist the person with SCI to become as independent as possible.

Among the key findings of the report is that there is evidence for expanded roles for both professional groups and this is especially evident in the international examples in countries that had already undergone primary care reform. In many of these countries in which direct access to these professionals is available, there were measurable improvements in the delivery of health care. Such improvements included:

- decreased wait times for surgery
- increased return to work

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- fewer emergency room visits
- fewer imaging studies
- increased patient satisfaction.

The roles for occupational and physiotherapists included incorporating screening, triaging and diagnosis in their work. Such tasks speak to a greater role for rehabilitation therapists, starting right in the Emergency Departments of hospitals.

While the primary objective of this project was to provide a synthesis of information from the literature and to describe national and international models/ experiences that integrate rehabilitation into primary care, the secondary objective was to describe the preparation of the professionals of these disciplines. The study examined the academic programs provided nationally for occupational and physiotherapists within primary care.

With a view to making the increased integration of occupational and physiotherapists

into primary care run as smoothly as possible, the study determined that students in these disciplines would benefit from an expanded



curriculum with greater exploration of roles and responsibilities, more experience with interdisciplinary practice and chronic disease

management and the implementation of health promotion principles.

The information provided by this comprehensive survey positively impacted policy development related to the ongoing process of rehabilitation renewal in Ontario. Since this report was published in 2006, the scope of practice for physiotherapists in Ontario was extended as part of the health

care restructuring in the province.

"The report has been used by both the

physiotherapy and occupational therapy associations in developing the roles in primary care and in developing curriculum for both professions in preparation for work in this setting," Richardson said.

The research was presented at a number of professional conferences in Canada.



Upcoming Events

November 5: *Knowledge Mobilization Seminar Series - A forum for consumers and healthcare professionals to learn and discuss updated research.* Sponsored by ONF and Thomson Rogers, Canadian Paraplegic Association Ontario presents: Thunder Bay, ON. 11:30 am-3:00 pm. Dr. Magdy Hassouna, a urologist at Toronto Western Hospital and Toronto Rehab, will speak on Bladder Management and Prevention of Urological Complications. Diane Leber, a nurse with Toronto Rehab, will speak on Skin and Wound Care. For more information, contact: info@cpaontario.org.

November 8-9: *Toronto ABI Network Bi-Annual Conference.* Toronto, ON. This conference is for rehabilitation professionals, service providers, insurers, legal representatives and others working with individuals with an ABI, as well as individuals and families who are living with acquired brain injury. Four amazing keynote speakers include: Dr. Thomas Kay; Dr. Robert Karol; Dr. Steve Joordens; and Greg Noack. For more information, visit: <http://www.abinetwork.ca/conference2010/index.htm>



It's All in the Head

*A concussion
is a
brain injury*

If a child admitted to hospital via the Emergency Department with a brain injury is diagnosed with a concussion instead of a brain injury, the chances are good that the child will be discharged from hospital sooner and return to school earlier than a child with a similar injury who receives a brain injury diagnosis.

A recent Ontario Neurotrauma Foundation (ONF) funded study led by Carol DeMatteo, occupational therapist and associate clinical professor in the School of Rehabilitation Science and investigator at CanChild at McMaster University, found that the labeling of an injury as a "concussion" was not necessarily determined by the severity of the injury. In her study, the term "concussion" was applied to a range of cases including those considered to be serious brain injuries by injury severity scales.

ONF funded DeMatteo's study on children and Mild Traumatic Brain Injury (mTBI) in order to improve outcomes for children with brain injuries. The study examined the cases of 434 children admitted to McMaster's Children's Hospital

over a period of two years. Of the 341 children who were found to have sustained a traumatic brain injury, about one third were given a concussion diagnosis, most often when the CT scan was normal. But DeMatteo stresses that it is a well known fact that a normal scan doesn't necessarily rule out a brain injury. The majority of mild traumatic brain injuries will not show up on CT. "A shaken brain can result in a cascade of symptoms even if there is no structural damage to the brain", DeMatteo said.

DeMatteo's team found that when a brain injury was called a concussion, the effect was that everyone from the physicians to the parents tended to treat the injury less seriously than in those cases in which a brain injury was called a brain injury. Children who were given the concussion diagnosis tended to be released from hospital earlier and given the all clear to return to school and normal activities earlier than those children whose diagnosis was not concussion but rather brain injury.

There is no universally accepted definition of the term "concussion"

despite its common usage among physicians, coaches and the public. "The popular definition of a concussion is that it's a hit to the head. You've had your bells rung but no real injury to the brain." DeMatteo said. "But a concussion is a brain injury. Calling a brain injury a concussion makes it sound less serious and that's where the problems can start." If a person returns to normal activity too soon, their symptoms could be prolonged and/or worsened before the injury has fully healed.

DeMatteo published her findings in a January issue of the academic journal *Pediatrics*. In that paper, she details that while there are a number of scales for grading concussion there is no consensus on which scale should be used, particularly in cases involving children. As a result, there is no consistency in the use of the term "concussion". There also is no agreement on whether to call this sort of injury a concussion or a mild traumatic brain injury.

Symptoms of mTBI (concussion)

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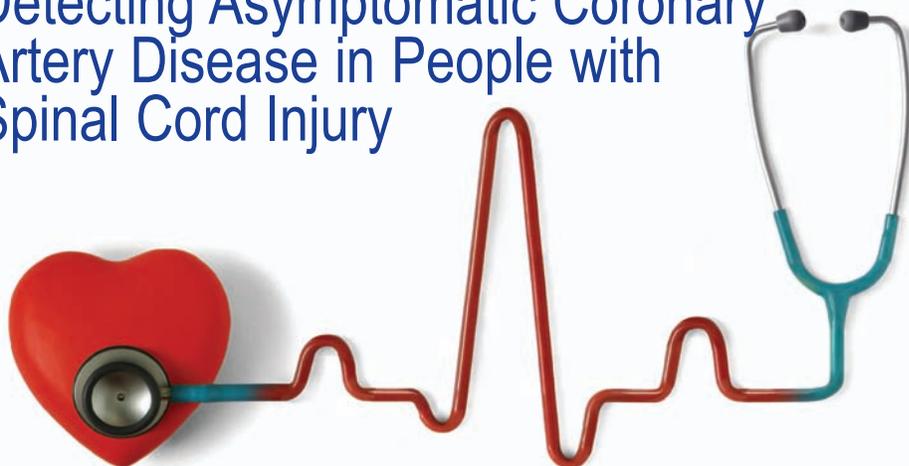
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can include headaches, dizziness, emotional/behavioural changes, fatigue, and memory problems. For a child at school, such symptoms can interfere in their academic and social performance. While most symptoms disappear within one week to three months of a mild trauma to the head, for some people, symptoms such as headaches and fatigue have been documented at one year and even 18 months after the injury.

If during the recovery period, a child with an mTBI were to sustain a further blow to the head, the risks of more serious damage to the brain and long term symptoms increase. Unfortunately, the likelihood of another fall or injury in which there is an impact to the head are higher for a person with a recent mTBI, as balance, reaction time, concentration and judgment can be affected by the original brain injury.

DeMatteo isn't necessarily advocating refinement about the use of the term "concussion" though. Although she used to prefer the expression "mild traumatic brain injury", now DeMatteo agrees with colleagues who worry that the term "mild" will have the same problematic effect of making people think there is nothing serious to worry about. She now prefers simply "brain injury". With a diagnosis of brain injury instead of concussion, DeMatteo thinks, and her research implies, that the injury will be taken more seriously.

Detecting Asymptomatic Coronary Artery Disease in People with Spinal Cord Injury



The most significant complication and leading cause of death for people with spinal cord injury (SCI) is coronary artery disease (CAD).

Everyone is at risk of developing coronary artery disease. The factors known to increase the risk are familiar to most of us: obesity, lack of exercise, diabetes, high blood pressure, smoking, stress, poor cardio-respiratory fitness. But while people with SCI are at risk like the rest of the population, for people with SCI, coronary artery disease is more likely to be asymptomatic (without warning) and that can prove to be deadly. Someone without an SCI might report a squeezing in the chest area or a burning sensation to their doctor leading to a diagnosis of angina and early detection of coronary artery disease. For individuals with SCI, by contrast, such symptoms may go undetected and thus the condition may go undiagnosed until people with SCI have a major problem such as a heart attack.

Currently the screening process for asymptomatic coronary artery disease (aCAD) for people with SCI is identical to the one used for the general population. The Ontario Neurotrauma Foundation (ONF) is aware that people with SCI need more specific screening procedures to determine the presence of aCAD and so decided to fund a research project designed to devise a

better diagnostic method. Led by post-doctoral fellow Masae Miyatani at the Toronto Rehabilitation Institute, the project proposes to develop a non-invasive clinical protocol for the early detection of aCAD among people with SCI.

Individuals with chronic SCI have higher cardiovascular mortality rates and death occurs at earlier ages compared with people who don't have SCI. Often, for people with SCI, a heart attack results in a decrease in independence and/or an increase in the caregiver burden. Compounding the problem, CAD is largely "silent" in people living with SCI because the nerve fibres involved in cardiac sensation are damaged in people with an injury above T4. As a result, often people with SCI are not diagnosed with CAD until they have a heart attack. Early detection of aCAD may reduce CAD-related mortality among people with SCI.

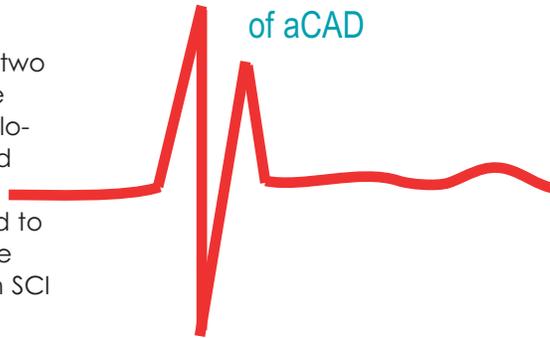
100 men and women with SCI between the ages of 18 and 80 years are being recruited from outpatient clinics and other sources to take part in the study. To determine eligibility, the participants are asked for clinical histories, and take part in physical examinations,

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cardio-respiratory fitness testing and blood screening. In order to be included, participants must have no previous history of angina or of a heart attack. As of late August of this year, 31 people have taken part in the study: 26 men and 5 women.

In addition to recruiting participants from the Toronto Rehabilitation Institute's patient database and from the outpatient clinics at Rumsey and Lyndhurst, Miyatani has launched a poster campaign and is actively seeking participants. This would involve three visits to the Toronto Rehabilitation Institute within a two month period. The results of the study will be used by epidemiologists, health care providers, and other stakeholders to develop aCAD screening guidelines and to formulate medical and exercise prescriptions for individuals with SCI suspected to have aCAD. "In

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addition to establishing a screening method, we want to enhance the understanding of the relationships between aCAD and the various risk factors. Our working hypothesis is that in the SCI population, cardio-respiratory fitness and level of injury are critical determinants of aCAD" Miyatani said.

The study will continue until May 2011 when the researchers hope to have completed the data collection and analysis. After that, the team will focus on sharing the protocol via conferences and journal publications. Miyatani also plans to participate in the Canadian Paraplegic Association Ontario's Knowledge Mobilization Series and to share the study results with people with SCI. For more information or if you would like to participate in the study, please contact the lead researcher by emailing her at Masae.Miyatani@TorontoRehab.on.ca.

Knowledge Mobilization Seminar Series: Sharing Research with Consumers

Well-Being After SCI: Growing Older and Staying Healthy

Last March, the Canadian Paraplegic Association (CPA) Ontario hosted a Knowledge Mobilization Series Seminar on growing older and staying healthy with spinal cord injury (SCI). Sponsored by the Ontario Neurotrauma Foundation (ONF) together with the law firm, Thomson Rogers, the seminar was led by Cathy Craven, Clinician Scientist and Physiatrist and Sander L. Hitzig, Postdoctoral Fellow, both of Toronto Rehab's Spinal Cord Rehabilitation Program. ONF sees the Knowledge Mobilization Seminar Series as an unparalleled way to get recent research into the hands of the people who stand to benefit from it most. The "Well-being after SCI: Growing Older and Staying Healthy"

seminar provided strategies for people with SCI to keep healthy as they grow older. Craven and Hitzig also reviewed recent research, tools and resources on aging and SCI.

In addition to typical age-related conditions like cancer, people with SCI are at a higher risk for some conditions, in particular heart disease and osteoporosis. Basing their findings on evidence-based research, Craven and Hitzig informed the audience that premature aging for people with SCI does occur in the cardiovascular system, the endocrine system (which controls hormones and the glands that secrete them) and the musculoskeletal system. The seminar leaders also presented some data from an Ontario-based

SCI aging study indicating that regardless of age and the number of years post injury, the risk of a number of secondary health conditions such as high blood pressure, heart problems, arthritis, osteoporosis, chronic pain and spasticity increases over time.

Hitzig's presentation focused on adjustment and coping strategies noting that people with SCI experience higher psychological distress (approximately 30%) than members of the general population.

Craven also presented her "100,000 km Tune-up" for people with SCI. The Tune-up is a check list designed to help people with SCI take charge of their health issues as they age.

Cathy Craven's 100,000 km Tune-up

Things You Can Do or Orchestrate Yourself

- See your family doctor and physiatrist at least once a year
- Keep a running list of your surgeries, medications and allergies, medical records including CT scans, X-rays and MRIs
- Carry your autonomic dysreflexia management card in your wallet
- Get an annual kidney and bladder ultrasound, as well as cystoscopy and/or urodynamic study as advised by your urologist
- Prevent pressure sores through routine pressure relief (3-4 times per hour), and regular wheelchair cushion checks
- Ask your doctor if you require annual breathing or sleep pattern tests
- Get your flu shot annually and keep your vaccinations (tetanus) current
- Check your bone density every 1-2 years
- Eat 15-30 grams of fibre and drink 1.5-2 litres of clear fluids each day
- Get routine cancer screening, and do your own monthly self exams (breast for women and prostate for men)
- Ask your doctor to check your heart rate, blood pressure, blood sugar and cholesterol, as well as your weight every year
- Minimize your lifestyle risks by not smoking and reducing your caffeine and alcohol intake
- Practise your stress reduction strategies
- Some of the strategies suggested to manage stress are: read a book, listen to your favourite music, go wheeling, do simple stretching and deep breathing exercises, cook a healthy meal, spend time with friends and family, volunteer

Partnership Matters:

Rick Hansen Institute

Ontario Neurotrauma Foundation (ONF) has had an ongoing relationship with the Rick Hansen Institute (RHI) over our eleven year history. This relationship has generated new research partnerships, collaborative funding strategies and joint advocacy on moving changes to practice and policy in supporting improvements in the quality of life for those living with a spinal cord injury (SCI).

Recently ONF and RHI developed a new memorandum

of understanding to focus our collective efforts on implementation of best practices, clinical research across the care continuum, capacity building, SCI Registry, knowledge mobilization and fostering international collaborations. Activity has been initiated in a number of these areas through the participation of our Spinal Cord Injury Committee and our researchers. Most recently we have developed a partnership with four SCI rehabilitation centres

to lead Ontario and, through our partnership with Quebec rehabilitation researchers, Quebec, into the national strategy that will implement best practices in the areas of pain, bladder management and pressure ulcers.

Our work with the RHI and with them our Ontario SCI Alliance is creating the capacity to advance our goal of improving the quality of life for those living with an SCI.

To both RHI and ONF, partnership matters.

