

# A World Inside

Research at **Toronto Rehab** Spring 2012



# Exceptional research in a **unique**

Message from **Dr. Robert Bell** *President and CEO, and*

The picture you see on the front cover of this DVD package doesn't look like a typical research lab – and it isn't. What's going on at Toronto Rehab is stretching the boundaries of rehabilitation research in exciting new ways.

Last year, Toronto Rehab and the University Health Network (UHN) became one organization – and Toronto Rehab's remarkable research program joined forces with an already outstanding research enterprise.

What's immediately noticeable about Toronto Rehab research is how broadly rehabilitation is defined. Keeping people out of hospital – by preventing injury and illness – is a key focus. Another is maximizing recovery for those who do go to hospital so they can return to independent and productive lives. Supporting family and professional caregivers is also an area of active research.

It's a team with a demonstrated

ability to translate ideas into new treatments and technologies, inform practice and policy making, and put products on the market to help people overcome everyday challenges.

Driving this research is a dedicated group of people who work in an extraordinary setting.

## **iDAPT** the world's most amazing rehabilitation space

Call it a world inside. Deep beneath Toronto Rehab is a giant motion simulator that can mimic environmental challenges of the world outside. Chambers are lifted on and off the base to generate snow and ice, different motions, slopes and terrains. It's part of the iDAPT Centre for Rehabilitation Research, which

# environment

**Dr. Christopher Paige** *VP Research, University Health Network*

opened in 2011. Built in collaboration with the University of Toronto, the iDAPT Centre is one of the most technologically-advanced rehabilitation research centres in the world.

Never before have researchers had a facility like this where they can safely and accurately study how people interact with their environment. iDAPT research is producing new ways to

reduce accidents and illness, and technologies and treatments for people living with injury, illness and age-related conditions.

And the need for this kind of research has never been greater, with chronic disease on the rise and a population that is growing older. Inside this package, you will see how Toronto Rehab is rising to this challenge.

# Practical solutions to common

Message from **Dr. Geoff Fernie** *Institute Director,*

At Toronto Rehab, researchers aren't happy unless they are solving problems every day. Common problems we all face, like slipping on icy sidewalks. And problems commonly experienced by people with disabilities, such as picking up objects after a stroke.

On the DVD in this package, you'll see some of the problems we're tackling – and solutions we're producing. You've already read on the previous page about our spectacular new iDAPT Centre for Rehabilitation Research. Now you can see inside it on our first DVD feature video.

Another video on the disc introduces Dr. Robin Green, a Toronto Rehab-UHN researcher and Canada Research Chair in Traumatic Brain Injury studying the troubling problem of concussion. She is collaborating with UHN neurosurgeon Dr. Charles Tator and others to better understand the effects of multiple concussions. In a study involving retired professional athletes, Dr. Green is testing interventions like cognitive

behaviour therapy that may alleviate some concussion effects. Of course, concussion also occurs with work injuries and accidental falls, so the findings will have broad implications.

In another video, we focus on a new approach to detecting sleep apnea, a condition strongly linked to cardiovascular disease. Our home-based sleep apnea detection device offers an easier, less expensive way to diagnose this condition. The ApneaDx™, developed by Dr. Hisham Alshaer of Toronto Rehab-UHN, is a great example of Toronto Rehab's ability to quickly translate ideas into products.

You may have heard a buzz of excitement about the work of Dr. Milos Popovic, an aerospace engineer turned research scientist. Dr. Popovic is using electrical stimulation in a novel way to reawaken paralysed limbs, improving people's quality of life and independence. Our video has dramatic sequences showing how this technology works.

# problems

*Toronto Rehab/University Health Network*

## Speeding up discoveries and applications

Everything is aligning to quicken the pace and outcomes of our research: collaborations with our new UHN colleagues and many others worldwide; our close working partnership with the University of Toronto; state-of-the-art laboratories; and outstanding graduate students, postdoctoral fellows and scientists.



And there are many more outcomes around the corner. In coming months, we'll bring you more videos from across our nine research teams. You'll hear about other solutions we're devising to help people live longer in their own homes, and help families. We'll spotlight discoveries that will improve the quality of life of many people and increase the efficiency of our healthcare system.

We are indebted to the Ontario Ministry of Health and Long-Term Care, and other ministries, agencies and foundations, for their support. These include the Ontario Ministry of Research and Innovation, the Ontario Innovation Trust, the Canadian Institutes of Health Research, and the Ontario Neurotrauma Foundation. Also key to our research are the generous individuals and corporations who contribute through the Toronto Rehab Foundation.

It is this support that allows us to solve problems every day – and maximize life.

# Innovation and **impact**

A sampling of the wide range of **Toronto Rehab research**



## Caring for **caregivers**

Nursing is more dangerous than mining. Rates of caregiver back injury remain high despite the introduction of mechanical patient lifts several decades ago. But Toronto Rehab research is pointing the way to safer approaches to lifting. Recent studies by doctoral student Tilak Dutta and others show overhead lifts are significantly safer for staff than floor lifts. Interestingly, spinal load is lower when one caregiver uses an overhead lift than when two use a floor lift. Toronto Rehab is developing SlingSertter™ (photo above) to reduce back injuries caused by inserting lift slings under patients. Also coming soon: RoboNurse, for areas lacking overhead lifts.



## Winter **footwear**

Injuries related to falling on ice or snow are a growing problem, especially in an aging population. Postal workers are particularly at risk because they walk in all types of weather across a range of surfaces. Funded by Ontario's Workplace Safety and Insurance Board, Toronto Rehab's Jennifer Hsu has completed a study of how well winter boots and anti-slip devices do on different surfaces. Results are being shared with collaborators at Canada Post and the Canadian Union of Postal Workers. Hsu, a University of Toronto PhD student, will be making recommendations on effective winter footwear and developing better footwear design criteria.

## – and its impact



### Detecting Sleep Apnea

Obstructive sleep apnea is a common yet underdiagnosed condition that increases the risk of cardiovascular diseases. Currently, people must spend a night in a sleep lab to be tested for sleep apnea. Long wait lists are common. Toronto Rehab's portable detection device offers an easier, less costly way to diagnose obstructive sleep apnea. It analyzes breathing sounds while a person sleeps at home. Recent results show remarkable accuracy. ApneaDx™ should be available in 2013, says Toronto Rehab researcher Dr. Hisham Alshaer, a University of Toronto PhD candidate developing the tool with Drs. Douglas Bradley and Geoff Fernie. (For more, watch our video on the enclosed DVD.)



### Optimizing Stroke Care

Research is producing advances in dealing with stroke. But how to put that knowledge into action? The 2010 Best Practice Recommendations for Stroke Care sought to close gaps between what's known and what's practiced. And now, most provinces have moved to implement those guidelines, says Toronto Rehab scientist Dr. Mark Bayley, co-chair of the Best Practices Working Group of the Canadian Stroke Strategy which, along with the Heart and Stroke Foundation of Canada, released the guidelines. They are already helping to make a difference, says Dr. Bayley. "In Ontario, stroke patients are going home more often, rather than to long-term care."



## HandyAudit®

More and more hospitals are using HandyAudit®, an electronic tool created by Toronto Rehab to provide objective, accurate and consistent hand hygiene measurements. Compared to the current paper-based observation system, HandyAudit saves time and reduces human error. Auditors use a handheld device to record actions of healthcare workers. Data is automatically analyzed and reports easily generated. The system was chosen by the Council of Academic Hospitals of Ontario for rapid implementation. It's now used at 85 hospital sites internationally. A start-up company, HandyMetrics Corporation, is steadily expanding sales. See [www.handyaudit.com](http://www.handyaudit.com)



## Brain Injury Screening

Over half of Toronto's homeless population has had a traumatic brain injury. That 2008 finding sparked calls for routine screening for brain injury among the homeless. Now, work is underway at a Toronto shelter to determine how best to screen for brain injury in homeless people. "It's a significant step towards routine early identification, which can lead to rehabilitation," says Toronto Rehab senior scientist Dr. Angela Colantonio, co-supervisor of the project with Dr. Jane Topolovec-Vranic of St. Michael's Hospital. Dr. Colantonio co-authored the 2008 study with principal author Dr. Stephen Hwang of St. Mike's.

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Total	<b>\$11,034,063</b>

*(does not include infrastructure awards)*

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## Publications

Journal articles	224
Book chapters	1
Total	<b>225</b>

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## Research Ethics Board (REB)

Oversight of current studies	182
Independent ethics assessment of new proposals	59

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