



BUILD THE FIRST-IN-THE-WORLD RESEARCH CENTRE FOR TREATMENT OF CHRONIC BRAIN INJURY



PROJECT LEADERSHIP

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THE CLINICAL PROBLEM

The enduring, disabling and progressive effects of brain injury are currently damaging the lives of more than 300,000 patients as well as their families in Canada. There is treatment to prevent deterioration and improve lives – but a critical gap in care during the chronic stages of injury means that only a small minority will receive it.

WHAT OUR RESEARCH TELLS US

For a decade, Toronto Rehab's Cognitive Neurorehabilitation Sciences Lab has been studying the brains and minds of people with serious brain injury while delivering clinical care.

- 96% of brain-injured patients will experience significant brain shrinkage from 5 months to 2 years post-injury
- The number of patients with significant anxiety will double – from 10% to 20% - from 2 months to 2 years post- injury
- The number of patients with significant depression will triple – from 6% to 18% - from 2 months to 2 years post-injury
- From 12 months to 2 years post-injury, 30% of patients will show a significant decline in their cognitive functioning

SOLUTIONS

Though we have found that the brain, mood and cognition deteriorate in the months and years following injury – regardless of a patient's age – we have also discovered some of the causes, including elevated anxiety and insufficient cognitive stimulation. Thus, our critical advances in basic research have opened new avenues for research and treatment.

A FEW THINGS WE HAVE WE DONE SO FAR

We have taken a proven treatment for depression and anxiety, adapted it, and shown its effectiveness for people with severe brain injury. We have also shown that we can deliver it remotely making it possible to provide therapy to patients around the province and the country. Given our finding that anxiety may shrink the injured brain, treating anxiety is essential.

Building on promising research, we have developed new treatment approaches. For example, “environmental enrichment” – intensive and continuously novel cognitive and physical stimulation – generates new hippocampal brain cells and helps them integrate into existing networks. Encouragingly, we have shown that we can remotely deliver environmental enrichment to severely brain-injured patients in their own homes in an automated fashion. Given our finding that inadequate cognitive stimulation (or cognitive environmental enrichment) is associated with brain degeneration in TBI (and that “using it” helps to prevent “losing it” in everyone), providing this increased stimulation may prevent brain shrinkage.

In short, evidence based, remotely deliverable treatments for improving brain health and every day functioning could reach the thousands who suffer for decades with disability. A dedicated centre would enable us to do this.

“OUR CRITICAL ADVANCES IN BASIC RESEARCH HAVE OPENED NEW AVENUES FOR RESEARCH AND TREATMENT”.

MODEL FOR THE CENTRE

A Centre of Excellence: Research and Treatment for the Lifelong Consequences of Brain Injury

- A virtuous circle in which clinical care, research and training are mutually beneficial.
- Patients will receive cutting edge therapies through participation in research.
- Therapies will be delivered by supervised trainees and technology, with help from partners around the province.

VISION FOR THE CENTRE	IMPACT OF CENTRE
Deliver the latest, evidence-based clinical care to Ontario patients, while concurrently conducting research.	While advancing research, get patients back to work, school and their communities, and out of social isolation, sadness and dependence. Provide intensive and specialized treatments designed to increase neurogenesis and brain connectivity, reduce neurodegeneration, and enhance cognition and mood. With “Big data”, discover new therapies and refine existing ones.
Scale up delivery of care to reach the 13,000+ patients in Ontario living with disability from brain injury using the latest tele-health and pervasive computing technologies.	Increased access to care. New delivery platforms to maximize the scale and intensity of therapies we can deliver to patients in their own homes and communities. Home-based monitoring of patient well-being and engagement in therapy.
Integrate service delivery with clinical training of students and fellows to increase clinical capacity in Ontario, while minimizing costs	Better trained brain injury specialists and researchers of the future, resulting in better, more, and more specialized care in Canada.
Create new scientific, clinical and commercial partnerships.	Improved economic and commercial climate for Ontario through increased partnerships with industry. International dissemination of our dual-purpose approach to care and research. New interdisciplinary relationships (e.g., neuropsychology & engineering) to generate novel research questions, and delivery platforms.

FUNDING OPPORTUNITY: \$5M

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| • Chair in Traumatic Brain Injury | \$2,000,000 |
| • Traumatic Brain Injury Research Fund | \$2,000,000 |
| • Traumatic Brain Injury Rehabilitation Fellowship Program | \$1,000,000 |

SUPPORT US. HELP MAKE INCREDIBLE HAPPEN.

For further information, contact:

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