

YOUR IMPACT

HURVITZ BRAIN SCIENCES PROGRAM





Sunnybrook's Garry Hurvitz Brain Sciences Centre will be the first of its kind in Canada. You are part of a community that has been critical to realizing this bold vision, inspiring a groundswell of support and rallying thousands of donors.

Progress continues on the Hurvitz Centre as we move closer to welcoming our first patients in 2024. A team of 250 construction workers are building this facility from the ground up and have recently met the latest major milestone: installation of 30,000 square feet of glass panels to complete the Hurvitz Centre's impressive facade.

A message of gratitude from Sunnybrook

This year marks one of the most exciting to date for Sunnybrook. That's because soon we will welcome the first patients to the Garry Hurvitz Brain Sciences Centre.

Thanks to our generous donor community, the Hurvitz Centre will be the first of its kind in Canada, driving innovation in brain health and personalized patient care.

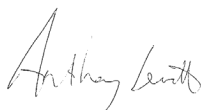
Uniting Sunnybrook's expertise, technology and brightest minds under one roof is unprecedented and will ignite a collective effort that will blaze new trails in the treatment and care of Alzheimer's, stroke, mental illness and addictions, and more.

Together, we are making breakthroughs across the Hurvitz Brain Sciences Program: from minimally invasive treatments for depression, to transformative research for neurological disorders, to our person-centred care for ALS and sleep disorders.

As a result, our combined efforts are making a tangible and lasting impact on patients and families. You will learn how people, like Barry Appleby (*see sidebar*), are grateful for the interdisciplinary approach to treatment and care that is unique to Sunnybrook and makes this place special.

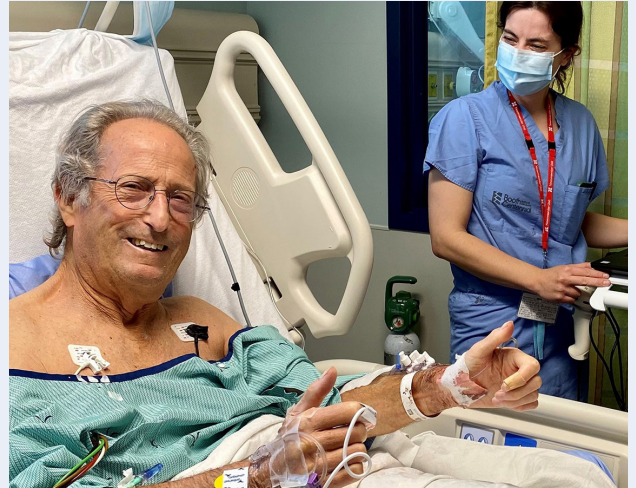
Your support made the achievements highlighted in this report possible, and so much more. Thank you for your steadfast trust and partnership. Together, we are changing the way the world understands the brain and the treatment of brain conditions.

Sincerely,



Dr. Anthony Levitt

Chief, Hurvitz Brain Sciences Program
Sunnybrook Health Sciences Centre



Two thumbs up

"My life was saved by Sunnybrook," says Barry Appleby, 82, a grateful patient turned donor to our stroke program.

In February 2023, Barry experienced an ischemic stroke at home with his wife Eleanor. He was rushed to Sunnybrook, where Dr. Christine Hawkes was ready. She is the only female neurologist in Canada who also performs endovascular neurointerventional procedures.

One procedure is an innovative clot retrieval, where Dr. Hawkes threaded a catheter from a small incision in Barry's leg up to reach the blockage in his brain.

The impact was immediate. "Right after the procedure, Barry was able to give a thumbs up to the entire team. It was an absolutely amazing moment," Dr. Hawkes recalls.

Even more amazing is Barry's continued recovery. The father and grandfather has resumed his pre-stroke activities – something neurologist Dr. David Gladstone calls "absolutely miraculous."

Barry is reminded of the first question he asked after his procedure. "I wanted to know if I'd be able to play golf again," he laughs. "For me to be able to tee up and hit a tiny golf ball is a true miracle."

Prioritizing person-centred care for **ANXIETY DISORDERS AND MENTAL HEALTH**

Sunnybrook's Frederick W. Thompson Anxiety Disorders Centre and Family Navigation Project are improving their quality of care through community-informed approaches. Philanthropic investment has been a key driver to our success.

Elevating care for patients with OCD

Over the past year, Sunnybrook's Frederick W. Thompson Anxiety Disorders Centre embarked on an comprehensive review of processes, services and programs, from initial referral to after-care, to ensure every stage of their delivery model is grounded in high-quality, person-centred care.

Dr. Peggy Richter, Head of the Thompson Centre says, "This is how we will continue to accelerate treatments and grow the Thompson Centre so that everyone who needs our help receives it, without delay."

In close consultation with patients and families, the Thompson Centre has implemented initiatives, such as:

- **Live-in orientation:** Inspired by a former client turned peer volunteer, the team implemented special group sessions to introduce live-in clients to the Thompson Centre and each other in a comfortable way to help set the stage for success;
- **Expanded after-care programming:** including peer-support groups, group exposure response and prevention therapy sessions, creating an alumni goals group and enhancing resources, such as a quarterly e-newsletter;
- **Leveraging of the Patient and Family Advisory Council:** a 14-member group of 10 former patients and family members, three staff and a patient and family advisor from the Department of Psychiatry to help inform and improve quality of care.

We are grateful to our donor community, whose steadfast support is transforming care for patients with OCD and related disorders.



A role created for youth, by youth

Sunnybrook's Family Navigation Project (FNP) is taking how it collaborates with young people to the next level.

Thalia Phi is FNP's Youth Advocate with Lived Experience, the first role of its kind in any healthcare navigation service.

The role was recommended by Sunnybrook's first-ever Youth Advisory Council, recognizing the need for peer support to enhance navigation of the mental health and addictions system.

With the help of donor funding, FNP launched a bold new Youth Engagement Strategy in order to tailor its approach and better serve the needs of a youth audience.

"FNP navigates for youth. Youth are at the centre of it all, so it's important we have that mindset and voice," Thalia says, noting that her role represents an important shift in focus for FNP.

Breakthroughs from the **HARQUAIL CENTRE FOR NEUROMODULATION**

Sunnybrook is a world leader in the field of neuromodulation. Bolstered by donor support, our teams continue to expand their exploration of novel treatment options and applications for neuromodulation techniques for patients experiencing the most challenging brain disorders of our time.



New gift will trailblaze patient care

Sunnybrook and the University of Toronto were proud to announce a landmark gift from the Harquail Family to expand Sunnybrook's Harquail Centre for Neuromodulation - a global centre for leading-edge, minimally invasive neuromodulation therapies for some of the most difficult-to-treat brain disorders.

The Harquail Family's latest gift of \$12 million brings the combined commitment from the Harquails and Sunnybrook Foundation to more than \$25 million, and will accelerate the Harquail Centre's work in neuromodulation research, education and patient care.

"This gift ensures that the Harquail Centre continues to push the envelope of what neuromodulation can achieve, with the potential to impact patients across Ontario, Canada and the world," says Dr. Nir Lipsman, director of the Harquail Centre and inaugural Harquail Chair in Neuromodulation.

Our leadership in brain research

Dr. Sean Nestor, a clinician-investigator and interventional psychiatrist at Sunnybrook's Harquail Centre, is the latest recipient of the Future Leaders in Canadian Brain Research grant.

Awarded by Brain Canada, the grant accelerates novel and transformative research that will fundamentally change our understanding of nervous system function and dysfunction. This work is crucial to accelerating potential new treatment options for patients.

Dr. Nestor is employing neuroimaging and investigational neuromodulation techniques, such as transcranial magnetic stimulation (TMS) to better understand the mechanisms behind a range of neurological and psychiatric disorders. He is currently leading therapeutic brain stimulation trials for post-concussive syndrome, treatment-resistant depression and amyotrophic lateral sclerosis (ALS) at Sunnybrook.

Your impact on

ACCELERATING IDEAS INTO ACTION

A Sunnybrook-led research team has been awarded a \$24-million grant to combat incurable neurological disorders like Alzheimer's, stroke and epilepsy. Plus, a world-first ALS clinical trial moves into its next phase. Donor support has been instrumental to propelling these promising projects forward.

Prestigious \$24-million research grant

Scientists at Sunnybrook have been awarded a \$24-million Transformation Grant from the Government of Canada's New Frontiers in Research Fund. The grant involves a 24-member international team that is led by Dr. Carol Schuurmans (*pictured right*), the Dixon Family Chair in Ophthalmology and Senior Scientist in Biological Sciences and the Hurvitz Brain Sciences Program.

In neurodegenerative disorders, neurons are damaged or destroyed, which can impact functions like movement, speech and cognition.

"One way to repair the brain in disorders like Alzheimer's or stroke might be to make new neurons out of existing cells, called glial cells, which are supportive in function and as prevalent in the brain as neurons," says Dr. Schuurmans.

The collaborative research team's aims are three-fold:

- **To develop novel gene therapies** that will turn common glial cells into healthy neurons;
- **To determine the best way to deliver gene therapeutics** into the brain; and finally,
- **To test the efficacy of the gene therapy approach** in models of Alzheimer's disease, stroke and epilepsy.

Sunnybrook's Vice President of Research & Innovation Dr. Kullervo Hynynen, who is also a co-awardee and collaborator on the project, notes that the major grant will help advance brain health in Canada and abroad.



Organoid research: Understanding and targeting retinal degeneration

Dr. Carol Schuurmans is also exploring how retinal organoids (tissue cultures derived from cells of individual patients) can offer a personalized approach to understanding how a disease develops in each patient. They provide a platform to screen for drugs that can stop disease progression and promote recovery.

Thanks to recent innovations in genomic engineering through CRISPR technology, which was awarded the Nobel Prize in 2020 and allows genetic mutations that cause disease to be corrected, the research team can now watch disease progression in real time and compare organoids derived from both diseased and "corrected" cells.

With these advancements, organoid research is fast becoming the leading-edge technology for disease modeling in both the brain and retina, and Sunnybrook is well-positioned to drive this work.

Your impact on

ADVANCING OUR KNOWLEDGE OF DEMENTIA

Supported by our generous donors, the Dr. Sandra Black Centre for Brain Resilience & Recovery is taking active steps to create a future free from dementia. Sunnybrook experts are focused on four pillars to deepen our understanding of dementia and transform care for patients.

Trailblazing treatments

In 2022, Sunnybrook neurologist Dr. Richard Swartz, the Bastable-Potts Chair in Stroke Research, influenced emergency stroke care worldwide with a new treatment (tenecteplase).

Dr. Swartz is now set to publish another study showing that the shorter the time to treatment, the less likely a patient is to experience cognitive impairment after stroke. This is the first time researchers have explored how the speed of treatment affects the cognitive outcomes of stroke.

“It shows the importance of timely treatment to not only functional outcomes, but also cognitive outcomes,” he says. “Getting faster stroke treatment helps limit injury to the brain, which means it can be resilient and recover faster.”

Biological mechanisms

Working at a cellular level, researchers are finding and understanding the signs of dementia earlier.

Walter Swardfager, PhD, has discovered that patients with type 2 diabetes carry the same enzyme that he previously identified in the blood of people with small vessel disease.

This common biomarker may explain why older adults with diabetes have higher incidences of Alzheimer’s disease and other dementias than those with normal glucose tolerance.

Dr. Swardfager explains that his goal isn’t just to treat people with diabetes and dementia, but to break the connection between diabetes and dementia.

Health-system change

Sunnybrook is shining a light on previously unexplored perspectives in brain health.

About two-thirds of people diagnosed with Alzheimer’s disease are women, and neuropsychologist Jennifer Rabin, PhD, wants to know why.

Using Canada’s largest dataset on aging, Dr. Rabin identified that women who have more vascular risk factors – such as high blood pressure, obesity and diabetes – and experience menopause at earlier ages exhibit a steeper decline in cognitive function.

“We still have much to learn, but it’s clear that personalized medicine must include sex-specific strategies for brain health,” says Dr. Rabin.

Knowledge exchange

Inventing the future of brain resilience and recovery is dependent on the next generation of researchers.

Kristiana Xhima, PhD is a University of Toronto doctoral graduate and medical student exploring how the cholinergic system – a branch of the nervous system involved in memory – is impacted by vascular lesions in the brain.

Her research highlights the need for further investigation into the location of vascular lesions as a potential biomarker for Alzheimer’s.

“It’s certainly promising to set our sights on a potential biomarker that can be identified early on, thereby opening the door to early treatment interventions,” says Dr. Xhima.

OUR THANKS TO YOU

Sunnybrook's Hurvitz Brain Sciences Program is a world leader in brain health because of you.

Philanthropic support is accelerating the pace of our work and fueling breakthroughs for some of the most challenging conditions of our time.

We are grateful for you, our donor community, and all you continue to make possible.

Together, we are transforming brain treatment and patient care.