# YOUR IMPACT

## HURVITZ BRAIN SCIENCES PROGRAM


WINTER 2023

# A MESSAGE FROM DR. ANTHONY LEVITT

## What's Inside



This year brings us closer to the completion of the Garry Hurvitz Brain Sciences Centre, the future home of the Hurvitz Brain Sciences Program. Uniting Sunnybrook's expertise, technology and innovation under one roof will allow for unprecedented collaboration, igniting a collective effort to invent the future of brain and mental health.

**This interdisciplinary approach to health care is exactly what makes the Hurvitz Brain Sciences Program exceptional. A pivotal factor to our success is the continued partnership and support of our donor community.**

This report offers you a front-row seat to see how our collaborative and interdisciplinary approach translates into the Hurvitz Brain Sciences Program's daily activities and long-term goals. Jenny Shin's story (*pictured on the next page*), are a testament to this strength.

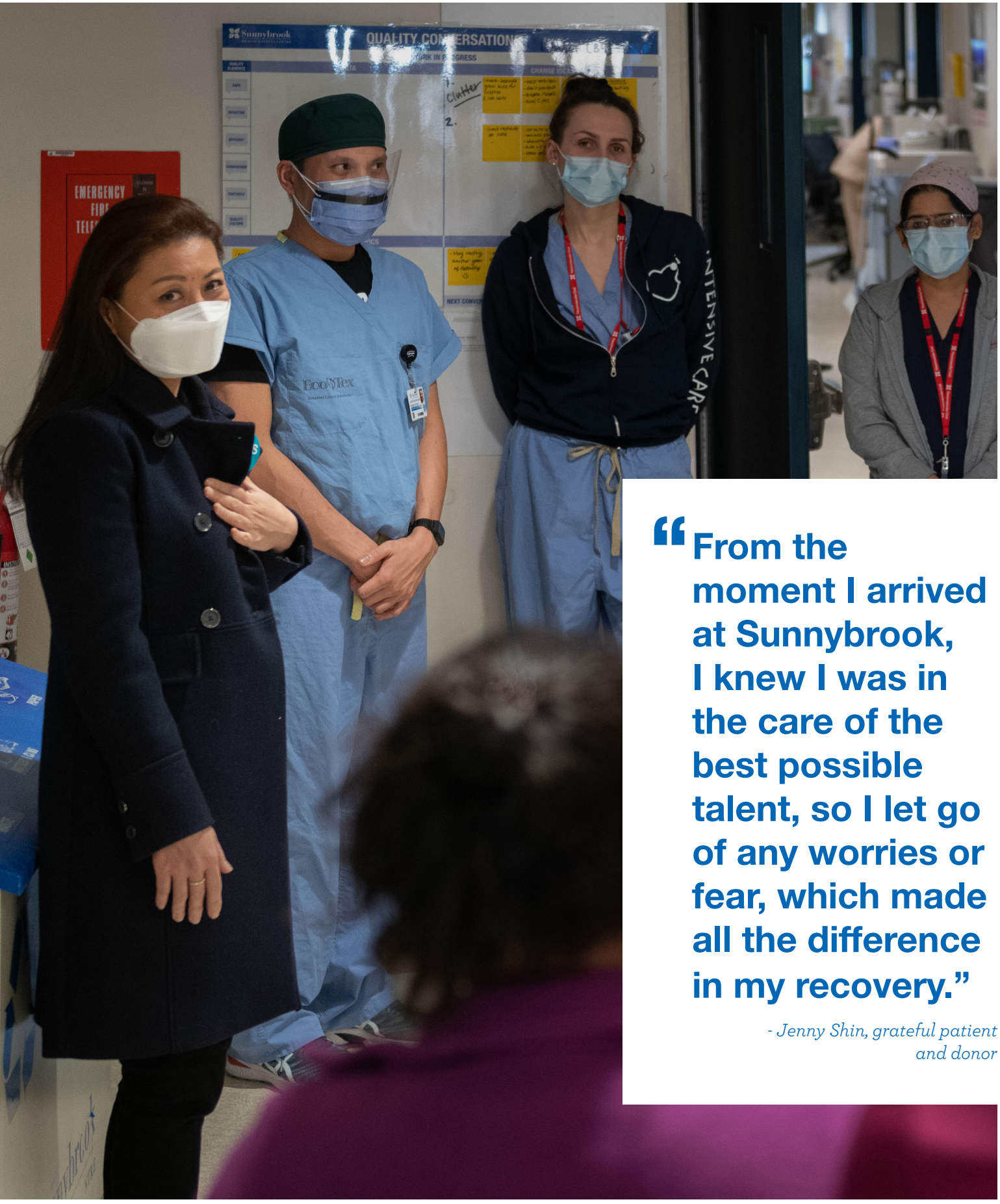
You will see that your support has made research breakthroughs possible and brought us to historic milestones in virtually every area across the Hurvitz Brain Sciences Program. From world-firsts that are changing practice, to integrating community voices in our programming, what drives our work is the goal of discovering and implementing new treatments and models of care that improve the quality of life of our patients, their families and caregivers.

**We would not be able to do this work without your generosity, as a valued member of our donor community. Your support directly impacts those who depend on Sunnybrook's brain and mental health expertise. Thank you for helping us be there, when it matters most.**

Sincerely,

**Dr. Anthony Levitt**
**Chief, Hurvitz Brain Sciences Program**

*On the cover: Construction on the Garry Hurvitz Brain Sciences Centre. Learn more about the new building on page 5.*
*Right: Jenny Shin takes a moment to thank the multidisciplinary team in the neurovascular unit. Read her story on page 4.*




**“From the moment I arrived at Sunnybrook, I knew I was in the care of the best possible talent, so I let go of any worries or fear, which made all the difference in my recovery.”**

*- Jenny Shin, grateful patient and donor*

# SUNNYBROOK AND THE POWER OF 'THE CHAIN OF SURVIVAL'

## Jenny Shin experienced two medical emergencies within minutes of each other. Sunnybrook's neurosurgical and neurovascular teams leapt into action.

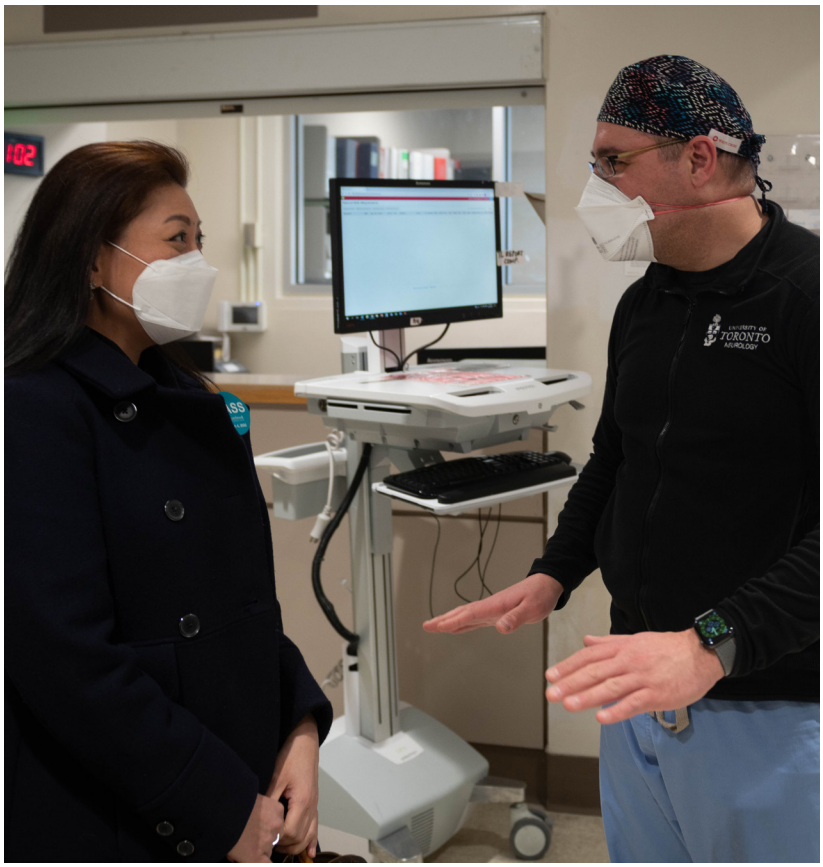
On the morning of November 3, 2021, Jenny Shin, a 47-year-old Toronto public relations agency owner, experienced a sudden, severe stroke. Jenny's sister, Betty, was driving the two of them to work and reacted quickly by taking her to get help. They ended up at a nearby hospital and while getting out of the car, Jenny tumbled head-first to the ground.

In addition to experiencing a stroke, Jenny would later learn she had also broken her neck. She was rushed to Sunnybrook, one of 11 regional stroke centres in Ontario.

Medical Director of the Inpatient Stroke Unit Dr. Houman Khosravani notes that Jenny's case demonstrated "the power of what we call the chain of survival," meaning that the neurosurgical and neurovascular teams had to work together to balance the complexities of two potentially life-threatening conditions.

The team's superlative efficiency was the result of several years of careful work and planning. In a joint effort between the stroke program, the emergency department, diagnostic imaging and neurovascular surgery, the teams focused on quality improvement and patient safety.

**Dr. Khosravani notes that Sunnybrook is "perfectly situated" to work on innovation in brain sciences because their stroke program "is nestled within a large body of expertise in neurosciences, including cognitive neurology, neuromuscular conditions, sleep medicine, neuromodulation and neurosurgery."**



Above: Jenny Shin with Dr. Houman Khosravani, medical director of the inpatient stroke unit and a clinician specializing in stroke innovation.

It's a philosophy of multidisciplinary collaboration that will be embodied in the Garry Hurvitz Brain Sciences Centre, a state-of-the-art facility that will be unprecedented in the field of brain sciences.

As for Jenny, after some time in the ICU, she transitioned to Sunnybrook's neurovascular unit. There, she received multidisciplinary care including physical therapy, which was continued at Sunnybrook's St. John's Rehab.

With perseverance and hard work, Jenny eventually graduated to walking in her signature high heels. Now, she's grateful for the leading-edge care that has allowed her to return to her life.

# A TRANSFORMATIVE SPACE THAT WILL ELEVATE RESEARCH AND PATIENT CARE

The Garry Hurvitz Brain Sciences Centre will revolutionize the future of brain and mental health and redefine how high-quality care is delivered. Donor generosity makes it possible to expand our spaces so we can serve more patients and achieve more research breakthroughs.


## Construction milestones at the Garry Hurvitz Brain Sciences Centre

Anticipation is building as a new home for brain and mental health care is taking shape at Sunnybrook's Bayview campus.

Marking a major construction milestone, in Fall 2022 the crane was removed from the site. The removal of the crane means the foundation has been laid and the frame of the building is complete, transforming the landscape and bringing our bold vision one step closer to realization.

The next phase focuses on the exterior and interior of the new building. Construction is expected to be completed in 2024.

Given the successful progression of the project, external specialists in occupancy planning are currently being engaged to help create a strategy for moving Sunnybrook patients and staff into the building, as we look ahead to an exciting new future in brain sciences at Sunnybrook.

The new Garry Hurvitz Brain Sciences Centre is an ambitious $154 million project. With an investment of $60 million from the provincial government and $78 million committed by our donor community, we continue to build momentum and close the funding gap required to build this new state-of-the-art Centre.

**Thanks to the support of our community of donors, the new Centre will serve patients with a range of brain and mental health disorders and will unite experts to advance practice-changing discoveries in brain health.**

# SUCCESSES FROM THE DR. SANDRA BLACK CENTRE FOR BRAIN RESILIENCE & RECOVERY

The Dr. Sandra Black Centre for Brain Resilience & Recovery is continuing to unlock the mysteries of the brain and gain new insights into the relationships between the neurovascular system, aging and dementia. Here are achievements from our four areas of focus, made possible by donor support.

## By the numbers:

**11**
scientists

**36**
active studies*

**22**
graduate & post-graduate trainees

**27+**
team-related journal publications

**100+**
research collaborations

**includes 14 pharmaceutical trials for persons with mild stage and presymptomatic Alzheimer's disease*

## Biological mechanisms

**Through studies ranging from protein biomarkers to cardiovascular risk factors, researchers are uncovering the signs of dementia earlier.**

A groundbreaking discovery identified the molecular pathways associated with small vessel disease (SVD), an important contributor to cognitive decline and dementia. The Dr. Sandra Black Centre is now partnering with a team of scientists who are developing a drug that targets a specific enzyme expressed in the blood of people with SVD, with the goal of improving blood flow to the brain and delaying cognitive decline.

Another project is combining brain imaging and artificial intelligence to map the physical and functional connections between the neurons in the brain and pinpoint precisely where and when the connections start to fail in patients with early-stage dementia. The team is developing a novel computational model that may predict cognitive decline based on imaging, genetic and clinical data. If successful, they will help open the door to personalized treatments and enable us to track the potential benefits of disease modifying treatments.

## Precision treatments

**A growing number of our studies are targeting new, effective ways to prevent, rehabilitate and build resistance against dementia.**

One notable project is the development of a blood test that, when combined with other next-generation biomarkers, can tell doctors who is most at risk, who already has Alzheimer's disease and how fast the disease is progressing.

**"Imagine having a relatively cheap and simple blood test that allows us to use those therapies combined with lifestyle changes to both treat and slow progression of the disease even before symptoms start. This is the future of dementia care," says Dr. Sandra Black.**

## Health promotion and system change

**Our researchers are scaling up their knowledge and discoveries to drive health promotion and speed system change across Toronto, Ontario, Canada and beyond.**

One study is exploring ways of helping patients with Alzheimer's disease and Lewy body dementia remain independent. Researchers investigated whether three key markers of dementia are associated with or predictive of disability in the activities of daily living. The findings point to the need for strategies, such as strict monitoring and treatment of cardiovascular risk factors, to help patients with dementia stay independent longer.

Another study aims to assess and educate Canadians on their knowledge of risk factors that may contribute to dementia. Recent estimates suggest that one in three dementia cases might be attributable to lifestyle factors such as obesity, high blood pressure and physical inactivity. While data gathering is still underway, the work is already impacting lives: after completing the survey, each individual receives information on how to reduce their risk of dementia.

## Knowledge exchange

**Through donor support, we are investing in the next generation of dementia researchers through awards, fellowships and training workshops.**

Dr. Sean Nestor is the 2022 recipient of the Dr. Donald T. Stuss – Young Investigator Research Innovation Award, presented to a promising early-stage researcher. Dr. Nestor is leveraging his award to launch a pilot study involving rTMS, a noninvasive therapy that uses magnetic pulses to stimulate the brain through the skull.

Additionally, this past summer eight neurology fellows and several research fellows and graduate students attended the 2022 Stroke Program in Neurorecovery (SPiN) workshop to network and learn the latest techniques and technologies in clinical stroke research.

The three-day online workshop included presentations from science experts, including Dr. Sandra Black (*pictured right*), Dr. Maged Goubran and Dr. Isabelle Aubert. Altogether, the event attracted more than 50 talented young scientists from across Canada and the United States and as far away as Australia.

## Awards and honours across the team

**Dr. Katherine Zukotynski**
SRI Cross Appointment
2022 Society of Nuclear Medicine and Molecular Imaging Fellow

**Dr. Richard Swartz**
AcT Trial, published in *The Lancet*

**Dr. Mario Masellis**
Appointed Research Lead, Division of Neurology, Temerty Faculty of Medicine, University of Toronto

**Dr. Sandra Black – Inaugural Canadian Stroke Consortium Sandra Black Lecture**
2022 Canadian Neurological Sciences Federation Congress (Montreal)

**Dr. Sandra Black – 2022 Bill Thies Award for Distinguished Service to ISTAART**
2022 Alzheimer's Association International Conference (San Diego)

**Dr. Sandra Black – Margolese National Brain Disorders Prize**
University of British Columbia

# PRIORITIZING YOUTH MENTAL HEALTH

## Supporting families through record-high demand

Between April 1 and June 30, 2022, the Family Navigation Project (FNP) experienced a 22-per-cent increase in demand over the same time period in 2021, marking their busiest quarter ever.

The growing demand for navigation assistance means mental health programs and services are stretched to the limit. Crucially, FNP's navigators are responding by identifying the resources youth and their families need while they wait for services, ensuring they are supported when it matters most.

"Throughout the pandemic, our navigators played a supportive role while people were waiting," says Sugy Kodeeswaran, FNP's executive director. "That continues today."

## Outreach by youth for youth

Sunnybrook's first-ever Youth Advisory Council (YAC) was launched in March 2022, with the goal of developing a Youth Engagement Strategy. The YAC is made up of eight youth with the lived experience of navigating mental health and addictions services.

"Youth are at the centre of it all, so it's important we have that mindset and voice," says Thalia Phi (*pictured above*), who in September 2022 became FNP's Youth Advocate with Lived Experience (YAL), the first role of its kind in any health-care navigation service.

The YAC partnered with Stella's Place, Subway Academy alternative high school and the mental health agency Lumenus to distribute the youth-friendly materials starting in early 2023. Once underway, YAC will work with FNP's research team to evaluate the impact of the outreach pilot project.


## 10 years of Toronto RBC Race for the Kids

On September 17, 2022 more than 6,500 people participated in the 10th annual Toronto RBC Race for the Kids, in support for youth mental health. Participants of every age raised more than $2.2 million for FNP.

For the past two years, the pandemic required the event to be held virtually. This year's event returned in-person to Mel Lastman Square but also gave participants the opportunity to join virtually from wherever they were.

**In its 10 years, the Toronto RBC Race for the Kids has raised more than $20 million for FNP. Thank you.**

As a direct result of the RBC Race for the Kids and our generous donor community, FNP has grown from a team of five to a team of 26, including navigators, an intake coordinator, a parent and youth advocate with lived experience, as well as consulting psychiatrists and researchers.

# GROWTH AT THE FREDERICK W. THOMPSON ANXIETY DISORDERS CENTRE

Annual treatment capacity has doubled, a year after the Ontario government's landmark $2.25-million annual commitment to OCD care

## Expanded aftercare program

The Frederick W. Thompson Anxiety Disorders Centre has launched an expanded aftercare program supported by a new full-time aftercare role, recognizing that many residential program patients could benefit from added support during the transition home. Until recently, the Thompson Centre offered limited one-on-one support to residential program graduates, along with a peer-led support group and monthly virtual ERP (exposure and response prevention) therapy sessions.

All of these services are now complemented by a new mental health recovery program for residential program graduates. The Wellness Recovery Action Plan (WRAP) is a series of workshops to help people create tools to plan and maintain their wellness. Developed "by patients for patients," and offered in partnership with Hope + Me, WRAP completed its eighth two-week session, having helped more than 30 patients ease into post-treatment life.

## New advisory council launches

Ten former patients and family members, three staff and a patient and family advisor from Sunnybrook's Department of Psychiatry are the inaugural members of the Thompson Centre's Patient and Family Advisory Council, which launched on October 26, 2022.

Reflecting on this milestone, Dr. Peggy Richter, head of the Frederick W. Thompson Anxiety Disorders Centre says: "It is only by injecting the voice of lived experience into our programs, policies and services that we can truly deliver patient-centred care."

The Council's first order of business is to develop terms of reference and a focal point for their efforts.

**Donor support has been central to our growth and bringing to life powerful initiatives like the Patient and Family Advisory Council. Thank you for helping us provide voice and give agency to the people in our care.**

## Research set to change practice and deepen our understanding of OCD

The first mindfulness study of its kind is underway at the Thompson Centre in partnership with McMaster University.

Research Director Dr. Neil Rector, Dr. Peggy Richter and psychologist Dr. Lance Hawley are co-leading the study to examine the benefits of a relatively new treatment option: mindfulness-based interventions involving regular meditation practice.

"If this study can demonstrate that a short-term mindfulness intervention can significantly reduce the suffering associated with OCD, the findings could easily be translated into routine clinical care in and out of hospital settings," explains Dr. Rector.

The results of another study have yet to be announced, but Dr. Rector has revealed a landmark finding from his OCD pregnancy study, which asked how stress, genetics, personality and cognitive factors affect a pregnant person's risk of developing OCD, anxiety or mood disorders during or immediately following pregnancy.

The discovery could lead to earlier identification and treatment of people at risk, in some cases even preventing their mental health concerns from arising at all.

# BREAKTHROUGHS AT THE HARQUAIL CENTRE FOR NEUROMODULATION

## Groundbreaking trial in Parkinson's disease moving to Phase 2



Researchers from Sunnybrook and University Health Network (UHN) are the first in the world to demonstrate that focused ultrasound technology can safely be used to deliver a therapeutic to targeted brain regions in patients with Parkinson's disease.

The project uses ultrasound waves to breach the blood-brain barrier, a layer of cells that protects the brain from toxins but can also block potentially helpful medications. The opening in the barrier allows the therapy to pass and reach a targeted brain region with millimeter accuracy.

Study researchers investigated the delivery of an enzyme, glucocerebrosidase, to an area in the brain related to movement. In Parkinson's, the enzyme can be defective and result in symptoms.

"Our early findings are an exciting and critical first step in less invasive direct-to-brain delivery of therapeutics to key areas of the brain important in the development and progression of Parkinson's disease," says Dr. Nir Lipsman, the study's co-principal investigator and director of the Harquail Centre for Neuromodulation.

## Deep brain stimulation effective in treating alcohol use disorder



Researchers at the Harquail Centre have provided early evidence that deep brain stimulation (DBS), is a safe and effective treatment for severe and treatment-resistant alcohol use disorder (AUD).

AUD is a medical condition that occurs when an individual is unable to control how much alcohol they consume, which can lead to debilitating health problems and difficulty functioning in daily life. It affects more than 10 per cent of the general population and experts say the rate of relapse is 75 per cent.

DBS is a procedure that involves implanting electrodes in specific brain regions to stimulate circuits responsible for abnormal symptoms. Results were promising, with all patients experiencing a significant reduction in their cravings for alcohol and some patients able to dramatically curb their alcohol consumption.

"These are significant and promising early findings that point to the opportunity for an innovative new way of treating alcohol use disorder," says Dr. Benjamin Davidson, first author of the study and surgical resident at Sunnybrook.

## Historic 10-year milestone for focused ultrasound at Sunnybrook

In May 2012, Sunnybrook researchers were the first in Canada to treat a patient using MRI-guided focused ultrasound in essential tremor. This groundbreaking research led to approval of the treatment by Health Canada and the United States Food and Drug Administration in 2016, revolutionizing the treatment of brain disease in Canada and around the world.

**This revolution in treatment and care was only made possible by your support. Thank you.**

# REVOLUTIONIZING EMERGENCY STROKE CARE


## First novel treatment option to be introduced in nearly 30 years

Researchers at Sunnybrook are at the forefront of the largest clinical stroke study of its kind in Canada. In a nationwide collaboration with the University of Calgary at the Foothills Medical Centre, researchers identified an effective approach to treating stroke that could change clinical practice. It's the first time a novel treatment option has been introduced in nearly 30 years.

"Our study findings have the potential to transform the current standard of care for stroke across Canada and around the world," says Dr. Richard Swartz, study co-principal investigator and stroke neurologist at Sunnybrook.

The study demonstrated tenecteplase (TNK), a medication which is commonly used to treat heart attacks, can effectively treat acute ischemic stroke.

While TNK was proven equally effective to the current gold standard treatment alteplase (tPA), it offers the added benefit of being cheaper and faster to administer because it doesn't require an infusion pump.

Significantly, Dr. Swartz explains that TNK "is given as just one shot in the arm - boom, done."

"And we know that the quicker people get treated, the better their outcomes." This means that TNK could potentially be administered wherever a patient is seen first, from a medical centre to a small hospital.

Published in June 2022, the research has already begun influencing stroke treatment guidelines for emergency stroke care in Australia; Canada and the United States are currently in the process of updating their expert recommendations. In Ontario, many sites are preparing to switch to TNK for stroke treatment in early 2023.

The manufacturer of TNK, meanwhile, is preparing to apply for Health Canada approval. If granted, it will mean the drug will be specifically packaged and marketed for approved use as an emergency stroke treatment.

**"This study is innovative, and our findings highlight a meaningful way that clinical care can be updated," adds Dr. Swartz. "It's exciting that our study has led to this a pivotal moment in stroke."**

# OUR THANKS TO YOU

Sunnybrook's Hurvitz Brain Sciences Program is leading innovation and treatment for brain health.

We are investigating some of the most challenging brain conditions of our time to better care for the patients we serve.

Our work is only possible with the support of our generous community of donors.

Thank you for helping us invent the future of brain and mental health care.

Sunnybrook FOUNDATION

2075 Bayview Avenue, KGW-01
Toronto, ON M4N 3M5
foundation@sunnybrook.ca
Phone: 416-480-4483