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Brain Health

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Why More Research Into Brain Function Is Needed To Better Understand Mental Health

With more Canadians struggling with depression and anxiety, the need for expanded knowledge and improved solutions has never been greater.

Michele Sponagle

Canada is in the midst of a mental health crisis. One in three Canadians say they’re struggling with their mental health, especially depression and anxiety. Mental illness is the leading cause of disability. By the time people in Canada reach 40 years of age, one in two have or have experienced a mental health condition.

While there have been improvements in outcomes for cancer, HIV, and heart disease, Canada is losing ground and seeing significant declines in mental health. More basic brain research is necessary to understand how the brain functions in health, as well as in illness. It’s clear that one-size-fits-all treatments do not work for all and enhancing research capability will help provide answers to longstanding questions about brain function.

Investing in brain research nets results

Brain Canada is an organization devoted to moving bold brain research forward – including mental health research. It does this by supporting ground-breaking projects. This focus on scientific solutions has seen life-changing results for patients, such as Raija Hilska, who was diagnosed with bipolar disorder in 2003. Though she was managing her condition with medication, she became depressed during the pandemic, leading her to seek other solutions at the Royal Ottawa Mental Health Centre.

Hilska was referred to a study funded by Brain Canada that uses repetitive Transcranial Magnetic Stimulation (rTMS), a non-invasive therapy using magnetic pulses, to modulate the brain’s circuitry and treat depression. This research is led by neuropsychologist and neuroscientist Dr. Sara Tremblay. “It has helped me,” says Hilska, who described her moods as always being more down than up. “When you’re not feeling well, you tend to dwell on

things. When you are able to control your brain, your thinking is more compact, and you are able to focus on things. I don’t look back as much as I used to,” she says after seven weeks in a rTMS study. Such promising results aren’t possible without Canada investing and prioritizing brain research.

She hopes that Brain Canada-funded research at The Royal will one day help make this relatively low-cost and non-invasive therapy (first approved by Health Canada for the treatment of depression in 2002) accessible and part of standard care for mood disorders, which affect as many as one in three Canadians in their lifetime. The therapy is not covered by most provincial health insurance plans.

Brain Canada’s work continues. This month, it announced the recipients of a multimillion-dollar research program to address the sex gap in basic mental health research. Often basic research studies focus on male subjects and falsely presume that results will be the same for female subjects — sex differences need to be addressed for better treatments.

“The inclusion of sex-specific biological considerations is instrumental in understanding the biological roots of mental health conditions,” says Dr. Viviane Poupon, President and CEO of Brain Canada. “We take great pride in supporting researchers who are at the forefront of addressing sex gaps in brain research.” ■



i Learn more about how Brain Canada is keeping brain health at the forefront to benefit all Canadians at braincanada.ca.

This article was sponsored by **Brain Canada**.





New Alzheimer’s Drugs Hold Promise, but Is the System Ready?

New disease-modifying treatments for Alzheimer’s disease will be available in Canada soon, but certain health system challenges need to be addressed first.

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Alzheimer’s disease is a progressive neurodegenerative disease with a devastating impact on people living with the condition, their families, and wider society. “Today, there are approximately 300,000 Ontarians living with Alzheimer’s disease or some form of dementia, and that will triple in Ontario within 30 years. In Canada prevalence is expected to slightly less than triple,” says Kyle Fitzgerald, Director of Public Policy and Government Relations at the Alzheimer Society of Ontario. “With this rise and prevalence of the disease, we’re going to see strain in every patient setting — be it primary care, acute care, hospitals, or long-term care.”

A new class of drugs has shown promise in clinical trials as a disease-modifying therapy for patients with early stages of Alzheimer’s disease. Pending regulatory approval, these drugs could help people with Alzheimer’s disease stay independent and functioning for longer, alleviating some of the potential strain on the health care system. But there are some barriers and challenges in getting them to the right patients.

A lack of critical resources
To benefit from the new therapies, patients need to be diagnosed and treated early. One critical barrier to early diagnosis is the lack of awareness of the importance of memory symptoms. “Individuals or their loved ones may not recognize the symptoms or be in denial about them and therefore wouldn’t raise these concerns with their family physician,” says Dr. Andrew Frank, a cognitive neurologist at the Bruyère Memory Program in Ottawa.

Another challenge is that family doctors may lack the time, experience, or resources to assess memory. “Even if they’re able to do initial memory assessments, there aren’t a lot of specialists in

this field to do the follow-up memory test needed to make an initial diagnosis of mild cognitive impairment,” says Dr. Frank. As a result, the wait times are often lengthy. “In Ontario right now it can take anywhere from 12 to 18 months to see a dementia specialist,” says Fitzgerald.

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Today, there are approximately 300,000 Ontarians living with Alzheimer’s disease or some form of dementia, and that will triple in Ontario within 30 years.

A further barrier is the lack of diagnostic infrastructure to confirm an Alzheimer’s disease diagnosis. “With the arrival of new treatments, we need to be certain that what a patient has is indeed Alzheimer’s disease,” says Fitzgerald. “The only ways to do that right now are through biomarker diagnostics like positron emission tomography (PET) scans or a cerebrospinal fluid (CSF) analysis, and right now we don’t have the capacity to administer either of those at sufficient scale.” On top of that, these tests are not widely available as publicly reimbursed services to most Canadians.

Addressing the challenges head on
Resolving these barriers is a lengthy process with many steps and stakeholders to consider. “Canada needs to examine all these barriers and see what level of government

can provide resources and support for each,” says Dr. Frank.

One crucial initiative could be increasing public education about Alzheimer’s disease, the importance of taking memory seriously, and what new treatments are available. “There could also be more physician education programs and additional memory clinics to allow more patients to be assessed earlier,” says Dr. Frank. “There also needs to be more awareness and recognition that Alzheimer’s disease can present at younger ages, so that those patients can get timely diagnoses,” adds Fitzgerald. “Right now, we see resistance in primary care to consider Alzheimer’s disease as a possible cause of patients’ mild cognitive impairment until people are well into their seventies and eighties.”

The need for better access and affordability

Canada also needs to expand its infrastructure of PET scan and CSF biomarker diagnostics and look at covering these by provincial health-care systems. “Right now, Ontario has an amyloid PET registry pilot project, which allows a small number of individuals access to this test and reimbursement, but more will need to be done to improve access and affordability,” says Dr. Frank. “One thing that has us optimistic is that there’s very promising work on blood tests, which might allow us to replace these two expensive tests with a blood test, and that would be a very helpful development.”

The treatments may require monitoring for effectiveness and side effects through regular MRI scans. “However, again, MRI capacity is limited, so that’s another provincial policy aspect that needs to be looked at,” says Dr. Frank.

The good news is that we have a once-in-a-generation chance to offer people hope while also reducing the economic burden of Alzheimer’s disease at a societal level. But it can’t be done without addressing these system challenges so that patients have access to new treatments. ■



To learn more, visit **alzheimer.ca**.



Lilly’s Alzheimer’s Breakthrough a Testament to its Leadership

Lilly’s tenacity in Alzheimer’s disease research has led to breakthroughs in diagnostics and treatment and is helping to drive future innovations.

Anne Papmehl



Dr. Kenneth Custer
President & General Manager,
Lilly Canada



Dr. Luc Boulay
Senior Director of Medical Affairs - Neuroscience,
Lilly Canada

 Learn more at [lilly.ca](https://www.lilly.ca).

For 35 years, Eli Lilly has been driving scientific progress to improve the diagnostics, treatments, and outcomes for patients with Alzheimer’s disease. “It represents a long journey and a real commitment to this disease,” says Dr. Kenneth Custer, President and General Manager of Lilly Canada.

The company’s recent breakthrough in a new class of amyloid targeted therapies has just been accepted into regulatory review by Health Canada and is an example of this commitment. While not a cure, the drugs have the potential as disease-modifying therapies to help patients with early-stage Alzheimer’s disease prolong their function and independence.

Applying lessons learned from the past

Getting to this point hasn’t been smooth sailing. “There have been many failures of medications designed to try to modify the disease, which have challenged the amyloid cascade hypothesis,” says Dr. Luc Boulay, Senior Director of Medical Affairs - Neuroscience at Lilly Canada. “But Lilly’s tenacity, conviction in the science, and incremental improvements in our research have gotten us to where we can target new treatments

in a much better way.”

Lilly’s own innovation in diagnostic imaging played a key role. “Previously, the only way to confirm an Alzheimer’s disease diagnosis was through autopsy, so we couldn’t really tell which patients in the earlier unsuccessful trials truly had

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One of the key lessons we’ve learned is that if you wait too long, you miss the opportunity to make a positive influence on the outcome of the patient, so there’s an urgency to bring these drugs to Canadian patients as fast as we can.

Alzheimer’s disease. Some had other forms of dementia,” says Dr. Boulay. The new PET scanning techniques let researchers see both amyloid and tau proteins that aid in confirming a diagnosis. “That was a big advancement in getting us to a successful clinical trial,” says Dr. Boulay.

Lilly’s leadership team continues

to focus on improving the lives of people with Alzheimer’s disease and their families. “It starts with bringing meaningful medicine to the market and working with regulators and then payer bodies to make these medicines available to Canadians,” says Dr. Custer. “One of the key lessons we’ve learned is that if you wait too long, you miss the opportunity to make a positive influence on the outcome of the patient, so there’s an urgency to bring these drugs to Canadian patients as fast as we can.”

A critical door in Alzheimer’s research is now open

Looking to the future, Lilly will focus on doing just that, not only with its Alzheimer’s disease portfolio but through its growing pipeline in other areas such as genetic medicine. “We’re also making concerted efforts to be more inclusive in our clinical trials by involving people from different cultures and ethnicities so we can get a better representative sample of how these medications work in different patient populations,” says Dr. Boulay. Having opened a critical door, Lilly is poised to lead the way in developing therapies that will one day help to make Alzheimer’s a chronic and manageable disease. ■

This article was made possible with support from Lilly Canada.



Dr. Sandra Black
Scientific Director,
Dr. Sandra Black Centre For Brain Resilience and Recovery

Q&A Prominent Researcher Says That New Alzheimer’s Therapies Offer Hope

Dr. Sandra Black leads the Dr. Sandra Black Centre for Brain Resilience and Recovery at Sunnybrook Health Sciences Centre in Toronto. As a cognitive neurologist, she works at the forefront of research in Alzheimer’s disease and other neurodegenerative diseases. Mediaplanet recently sat down with Dr. Black to learn more about her work as a researcher and clinician, the types of patients she’s seeing, and how the new disease-modifying therapies for Alzheimer’s offer hope for the future.

What types of patients are you seeing in your clinical practice?
Typically, I see people in the early stages of the disease who are showing mild memory problems. They may also have wayfinding and word finding difficulties and some trouble with complex daily activities like banking or shopping, but can still manage their personal self-care. Some may present with perceptual problems, too, where they can’t find their way or negotiate stairs, or exhibit behavioural changes like withdrawal, apathy, or depression.

What kinds of treatment have been available up until now?
The drugs we currently have available offer only symptom management. They may help the patient focus attention or remember something, but they don’t have much effect on the disease progression.

What impact will the new class of disease modifiers have on Alzheimer’s disease?
These new amyloid targeted therapies offer the possibility to modify the disease and slow down its progression in people who are just starting to show evidence of memory loss while still managing daily activities, or just starting to need more help with those activities.

Are these medicines for everyone?
No. They’re suitable only for people at the very early stages when there are still lots of circuits functioning in the brain, and not everyone will qualify. Before administering the drug, patients may need MRI scans to ensure they don’t have any microbleeds or other issues that could signal that the brain can’t clear the amyloid properly. But they do offer a ray of hope if we can get the drug to the right patients early on.

Can you share any research insights that may help caregivers looking after someone with Alzheimer’s or dementia?
Try to be patient and understanding, especially when they’re in the early stages and starting to forget. Getting irritated and impatient is like an assault for them. They genuinely don’t remember.

How can people protect their own brain health?
Exercising, eating a healthy diet, and getting enough sleep are very important. Deep sleep is especially important because that’s when your brain is literally pumping out toxins, including amyloid protein. Also, make sure you get enough social engagement and interaction like caring for people, entertaining, volunteering, and having hobbies. These activities have been shown to stimulate the brain circuits and create a feeling of belonging.