



In this month's BrainBuzz, I highlight new autism research findings as well as fascinating brain science work that was celebrated during *Brain Awareness Week* last month. As always, kindly reach out if you have any questions or feedback at any time!

Aristotle Voineskos
VP Research, CAMH



New research finds majority of children

with autism may be 'doing well'

National study led by SickKids and CAMH takes a strengths-based approach to autism assessment

One of the biggest longitudinal research studies of its kind in the world led by The Hospital for Sick Children (SickKids) and the Centre for Addiction and Mental Health (CAMH) suggests that positive outcomes for children with autism spectrum disorder (ASD) are more common than previously thought.

[ASD](#) refers to a group of neurodevelopmental conditions resulting in challenges related to communication, social understanding and behaviour. One in 100 people may have ASD and although a person can be diagnosed at any time, ASD symptoms generally appear and are diagnosed in the first few years of life.

The multi-site study, [published in JAMA Open on March 29](#), applied a strengths-based approach to outcome assessments in children with an ASD diagnosis, measuring participants' proficiency (level of competency) and growth (improvement over time) in

five key developmental health areas: communication, socialization, activities of daily living and emotional health (internalizing and externalizing).

The study found that 80 per cent of children experienced growth or proficiency in at least one of the five domains and 23 per cent of children were doing well in four or more of the domains by mid childhood. Core to the study approach was shifting the definition of a 'good outcome' to 'doing well'.

"It was encouraging to find that most ASD children were doing well by 10 years old by some measure. By using different criteria to track their development apart from those used to diagnose autism — such as ASD symptoms and cognitive ability — we were able to reframe more holistically how we conceptualized progress in the autism field," says co-author Dr. Peter Szatmari, Psychiatrist in Chief, Department of Psychiatry and Senior Scientist, Neurosciences & Mental Health at SickKids, and Chief of the Child and Youth Mental Health Collaborative between SickKids, CAMH and the University of Toronto.

"Specifying an outcome implies that there's an end point, whereas doing well relates to an individual's circumstances at a particular point in their life's journey with autism — especially important since these kids are just at the start of a journey."

Strengths-based approach provides more holistic view of "doing well"

Historically, research literature and outcome evaluations have focused on the deficits people with ASD may experience in intellectual or skills development and less has been studied in the Canadian paediatric context.

The researchers followed 272 children diagnosed with ASD from clinics across Canada from the ages of 2 to 10 years old, or mid childhood, a notable age as children transition to greater autonomy and increased social and academic demands.

Unique to the approach was the use of growth as a measurement, which allowed for comparison of whether an individual child improved in a domain against their younger selves.

"Changing the narrative away from a deficit-based system to one that recognizes growth and success can serve as a foundation for building up each unique child as they tackle new skills and developmental stages in life," says Dr. Katherine Cost, co-author of the paper and Research Associate in the Department of Psychiatry at SickKids.

Family context may attribute to positive outcomes

The study also examined contextual factors such as household income, parent coping and family functioning (such as positive communication and support among family members).

The findings indicated that higher household income and better family functioning were important predictors in several aspects of doing well — suggesting that adequate income and a well-functioning family may help improve outcomes for a child with ASD.

“Contextual factors like household and family functioning remind us that an autism diagnosis exists alongside the social context in which ASD children are growing up,” says Cost.

Cost says while social and environmental factors have been studied in relation to their effects on child development, there is little research among children with autism.

A strengths-based perspective on an autism diagnosis can help support a more flexible approach to developing future interventions that’s tailored to each child.

“There is no one way of doing well, but these findings open up a new avenue of research to assess what types of specific interventions, such as providing more income resources or alternative treatment planning for families at an earlier stage of development, may help increase the likelihood that more children with ASD will do well over time,” says Szatmari.

The team – which also included researchers from Dalhousie University, McGill University, McMaster University, Simon Fraser University, Tel Aviv University, University of Alberta, University of British Columbia, University of Ottawa and University of Toronto – says future research will focus on outcomes among adolescents with autism as well as ways to further incorporate the perspectives of the participants themselves in outcome definition and measurement.

This study was supported by the Canadian Institutes of Health Research, Kids Brain Health Network, Autism Speaks, the Government of British Columbia, Alberta Innovates Health Solutions, and the Sinneave Family Foundation.



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“Did know that your brain activity is as unique as your fingerprints?” Functional magnetic resonance imaging (fMRI) allows studying brain activity patterns non-invasively in vivo and shows that they vary from person to person linked to individual cognition.”

Dr. Christin Schifani
Project Scientist
Brain Health Imaging Centre



#BrainAwarenessWeek

CAMH's Brain Science Dream Team

From March 15-21, CAMH celebrated Brain Awareness Week by showcasing the incredible work in the field of brain science that is being done at CAMH in research and clinical care.

A dietary supplement to eliminate postpartum depression. A nasal spray to prevent post-traumatic stress disorder (PTSD). A molecule that reverses memory loss and stops the progression of dementia.

These ideas have been dreamed up in the brains of some of CAMH's top brain researchers, ideas that, following many years of rigorous science, are becoming tantalizingly close to becoming a reality in the years ahead.

With access to cutting-edge technologies like the [Brain Health Imaging Centre](#) and [Azrieli Centre for Neuro-Radiochemistry](#) under the direction of [Dr. Neil Vasdev](#), CAMH scientists can search for clues and patterns in the brain more closely than ever before.

And with the ability of [Dr. Sean Hill's Krembil Centre for Neuroinformatics](#) team to harness the awesome power of artificial intelligence and machine-learning to refine that search—especially when it comes to identifying biomarkers of mental illness—more breakthroughs that could make a real difference in the lives of millions of people could be just around the corner.

“I am eternally optimistic,” says [Dr. Aristotle Voineskos](#), Vice President of Research at CAMH. “It’s almost hard to let myself dream that this will all become a reality, but then... Why not? Why should our efforts to defeat mental illness be any different than efforts to defeat cancer? We are in an incredibly exciting time. Our knowledge about the brain continues to grow exponentially. And we are now positioned to take advances in science and technology development and make a difference in the lives of patients today.”

“We are in the midst of what I would say is a revolution in brain science where the amount of knowledge has increased dramatically,” says [Dr. Etienne Sibille](#), Senior Scientist, [Campbell Family Mental Health Research](#)

[Institute](#), about his research on memory and aging. "It's a very exciting time for brain research and discovery."

The investments that CAMH has made over time in advanced technologies like these over the years has created a virtuous cycle of innovation: the better the tools CAMH can provide, the better it can recruit and retain the top scientists in their fields.

That's what allowed CAMH to bring back Dr. Vasdev, who had left for Harvard University but was lured back three years ago.

"My dream is to build the best radiochemistry program and the best brain imaging program in the world. That's what brought me back," says Dr. Vasdev.

"My dream is to create the perfect drug, a drug without side-effects," says [Dr. Fang Liu](#), Senior Scientist and Tapscott Chair in Schizophrenia, [Campbell Family Mental Health Research Institute](#), about her work on PTSD biomarkers.

In the collection of snapshots that follow, you will hear more about what CAMH's brain scientists are dreaming up these days. You will also see a few key patterns emerge: how the identification of biomarkers is transforming our understanding of mental illness, how collaborations among these brain research pioneers allows each of them to dream even bigger, and ultimately how all of this could help us find what some have called the Holy Grail of medicine: truly personalized mental health treatment that is as unique as the person receiving it. For better brain health. And for better mental health.

"I am optimistic that being able to build a better and more precise picture of a particular mental illness that an individual has means that we will be able to directly treat it and directly cure it," says Dr. Hill.

"Being able to understand what is happening in each person's brain and being able to deliver a targeted treatment that is specific to them, I think that is the Holy Grail of medicine," says [Dr. Daniel Blumberger](#), Clinician Scientist, [Campbell Family Mental Health Research Institute](#) and Director of the [Temerty Centre for Therapeutic Brain Intervention](#). "It's amazing to think about how many people we can help with these personalized approaches."

To learn more about the breadth of brain science at CAMH, click the links below to meet some of the brilliant minds who are advancing the cause:

- [The perfect drug](#) - Dr. Fang Liu
- [Hope for new mothers](#) - Dr. Jeff Meyer

- [Making old brain cells feel young again](#) - Dr. Etienne Sibille
- [The best in the world](#) - Dr. Neil Vasdev
- [The brain bank](#) - Dr. Sean Hill
- [We can change the brain](#) - Dr. Stephanie Ameis
- [It's amazing to think about how many more people we can help](#) - Dr. Daniel Blumberger
- [One dream at a time](#) - Dr. Aristotle Voineskos



Faces of CAMH: Hajer Nakua

Hajer Nakua, a graduate student working in research at CAMH, is the winner of a prestigious Fulbright Student Award. The award will enable her to work in the U.S. for a nine-month period with **Dr. Russell Poldrack**, a world leader in brain imaging research, at Stanford University in California.

Since 2018, when Hajer joined CAMH while completing her Master's degree, she has been working with **Dr. Stephanie Ameis** in the Child and Youth Psychiatry Division and the Kimel Translational Imaging and Genetics Research Lab. Given health concerns and travel restrictions amid the pandemic, Hajer is working remotely at CAMH until she receives a green light to travel to the U.S. to begin this exciting part of her career.

"My area of research uses brain imaging techniques to understand the relationship between behavioural dimensions (e.g. externalizing or internalizing behaviours) and the structure and function of the brain across children with neurodevelopmental disorders, mainly autism spectrum disorder, attention-deficit/hyperactivity disorder and obsessive-compulsive disorder.

Research has shown that both externalizing (e.g., aggression) and internalizing (e.g., withdrawal) behaviours are linked to how brain regions are connected to one another. My focus is on understanding whether changes in brain connectivity are related to changes in behaviour in children with these disorders. Ultimately, I hope my research will contribute to a fuller understanding and to innovation in the field to hopefully result in better treatment and care.

I've wanted to work here at CAMH since Grade 12 because as I was completing research for a mental health project, I learned that CAMH is a world-leading research institution, and is doing rigorous, innovative research with the goal of improving clinical outcomes. I like the process of science, but it's important for me to have that clinical connection in my research. CAMH gives me a strong connection between what I'm doing and why I'm doing this research. I am grateful to work with Dr. Ameis and other researchers who are very motivated to help you grow as a scientist, and gave me the confidence to apply for the Fulbright award.

I became very interested in the Fulbright award because I like the idea of institutions working together. This will be an opportunity to merge expertise across CAMH and Stanford, so there will be reciprocal benefits. This is a chance for me to learn in the U.S. and come back to Canada and CAMH with new expertise to contribute back here."

Did you know...

Hajer blogs about brain science in both English and Arabic on [Instagram](#). "I am interested in how to use social media to talk about brain science research to people who usually don't have access to that research and in a space that is not normally used for science. As well, science is typically published in English, so it's not readily accessible to all languages. I started the blog in July 2019 in English, then expanded to both languages. It's been an amazing experience because I have been able to share mental health and neuroscience research with followers from North America and the Middle East. My goal is to simplify complex concepts in neuroscience so people can understand their brains. I say that the more you know your brain, the more you know yourself."

Get In Touch!

 Aristotle Voineskos | VP Research, CAMH | aristotle.voineskos@camh.ca

 Eileen McMahon | Chair, CAMH Research Committee of the Board of Trustees | emcmahon@torys.com

 Stephanie Capobianco | Acting Director, Research Strategy, Policy & Operations, CAMH | stephanie.capobianco@camh.ca

Centre for Addiction and Mental Health
Research Services Office
33 Ursula Franklin St., Toronto, ON M5S 2S1

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