



Research Institute
Report to the Board
FISCAL YEAR 2026

Contents

Letter from the Chair (EN/FR)	4	Goal 2: Advance the evolution of The Royal into a rapid learning health system	37
Letter from the CEO (EN/FR)	6	Internal Culture	37
Executive Summary	8	Informatics Capabilities & Capacities	41
The Clinical Brain Research Centre	10	Learning Health System Impact	43
Brain Imaging Centre	12	Governance & Oversight	45
Interventional Psychiatry	14	Goal 3: Reduce the gap between discovery and impact for clients, patients,	
Neuromodulation Research Clinic	15	families, the community and society at large	46
BMO Innovative Clinic for Depression	17	Meaningful Client, Patient & Family Engagement	46
Clinical Sleep Research Unit	19	Research Capacity & Intensity	46
Music and Mental Health Research Clinic	21	Client, Family & Community Impact	51
Cognitive Health Research Clinic	23	Goal 4: Become a globally renowned academic health science centre for	
Strategic Research Plan in Action	25	mental health research and innovation to amplify research impact	52
Goal 1: Propel The Royal's impact and profile by focusing on distinctive		Partnerships with Community Organizations	52
research in specialty areas	27	Multi-Institutional & Multi-Sectoral Partnerships	56
Depression & Anxiety	27	Industry & Innovation Partnerships	57
Trauma & Stress-Related Disorders	29	Recognition	58
Schizophrenia & Other Severe & Complex Mental Illnesses	29	Research Institute Board & Committees	64
Mental Health in Equity-Deserving and At-Risk Populations	30	Things to Watch for in FY2027	66
Addiction	30		
Talent	33		

LETTER FROM THE CHAIR

Every year, thousands of people walk through the doors of The Royal carrying something difficult – a diagnosis, a fear, an exhaustion that has outlasted every remedy tried so far. Some of them, in the middle of all that, choose to do one more thing: they say yes to research. They give their time, their most personal stories, and in some cases, years of their lives to studies that may benefit them directly or may not – but that will almost certainly benefit someone who comes after them.

That act of trust is the foundation of everything in this report. It is also an act of hope.

Research at this scale only happens because people extend that generosity. The trials, the discoveries, the infrastructure – none of it moves without the decision to participate. And what that participation has made possible here, across a research portfolio of more than 170 active projects, is extraordinary. More than 7,500 people from within and outside The Royal said yes to research this year.

In return, we offer those patients cutting-edge diagnostics and treatments that often would be otherwise unavailable to them. Over my time here with the Research Institute, I've seen the scale and sophistication of the tools and approaches we offer both grow and show success. That success can be life-changing for patients. And at the same time, it is attracting attention in the wider research community. People want to work with our researchers, and with the imaging infrastructure that places The Royal among a handful of peers worldwide.

I am grateful to the patients and families who chose to trust us during some of the most challenging times in their lives. To the individuals and foundations that have entrusted us with tens of millions of dollars to enable and fuel these advancements. To the partners and organizations who extend our reach and allow us to work at a scale far beyond what we could do alone. And to the exceptional research and clinical team that shows up every day to make the aspiration real.

I also want to acknowledge transitions on the board that deserve recognition.

LETTRE DU PRÉSIDENT DU CONSEIL D'ADMINISTRATION

Chaque année, des milliers de personnes franchissent les portes du Royal en portant en eux quelque chose de difficile – un diagnostic, une peur, un épuisement qui provient d'une résistance de la maladie à tous les remèdes essayés jusqu'ici. Certaines d'entre elles, au milieu de tout cela, choisissent de faire une chose de plus : elles disent oui à la recherche. Elles donnent leur temps, leurs histoires les plus personnelles et, dans certains cas, des années de leur vie à des études qui pourraient les aider directement – ou non – mais qui bénéficieront presque certainement à d'autres qui viendront après elles.

Cet acte de confiance est le fondement de tout ce qui figure dans ce rapport. C'est aussi un acte d'espoir.

La recherche à cette échelle n'est possible que parce que ces personnes font preuve d'une telle générosité. Les essais cliniques, les découvertes, l'infrastructure – rien de tout cela n'avance sans la décision de participer. Et ce que cette participation a rendu possible ici, à travers un portfolio de plus de 170 projets de recherche actifs, est extraordinaire. Cette année, plus de 7,500 personnes – au sein du Royal et au-delà – ont dit oui à la recherche.

En retour, nous offrons à ces patients des diagnostics et des traitements de pointe qui, autrement, leur seraient souvent inaccessibles. Au fil de mon parcours à l'Institut de Recherche, j'ai vu l'ampleur et la sophistication des outils et des approches que nous proposons continuer de croître et de porter leurs fruits. Ces résultats peuvent transformer la vie des patients. En même temps, ils suscitent l'intérêt de la communauté scientifique au sens large. De nombreux chercheurs souhaitent collaborer avec nos équipes et tirer parti de l'infrastructure d'imagerie qui place Le Royal parmi un petit nombre d'établissements comparables dans le monde.

Je suis reconnaissant envers les patients et les familles qui ont choisi de nous faire confiance durant certaines des périodes les plus éprouvantes de leur vie. Envers les particuliers et les fondations qui nous ont confié des dizaines de millions de dollars pour rendre ces avancées possibles et les soutenir. Envers les partenaires et les organisations qui élargissent notre portée et nous permettent de travailler à une échelle bien au-delà de ce que nous pourrions accomplir

Lewis Leikin steps down this year after nine years of dedicated service – a contribution that has shaped this organization in ways that will last well beyond his tenure. Suzie Gignac steps down from the Finance and Audit Committee, and Sonya Shorey from the chair of the Integrative Research Committee, where Duncan Stewart now leads. To each of them: thank you for your service to this community.

The work continues because the need continues. And because the people at the centre of it – patients, families, and the community that surrounds them – deserve nothing less than our full effort.



A handwritten signature in black ink, appearing to read 'M. von Herff'.

Michael von Herff
Chair, Research Institute Board

seuls. Et envers l'équipe de recherche et de soins cliniques exceptionnelle qui se présente chaque jour pour concrétiser cette aspiration.

Je souhaite également souligner des transitions au sein du conseil d'administration qui méritent d'être reconnues. Lewis Leikin quitte ses fonctions cette année après neuf ans de service dévoué – une contribution qui a façonné cette organisation d'une manière qui perdurera bien au-delà de son mandat. Suzie Gignac quitte le Comité des finances et audit, et Sonya Shorey quitte la présidence du Comité de recherche intégrative, dont Duncan Stewart assume désormais la direction. À chacun d'eux : merci pour votre service à cette communauté.

Le travail se poursuit parce que le besoin se poursuit. Et parce que les personnes au cœur de ce travail – les patients, les familles et la communauté qui les entoure – ne méritent rien de moins que notre engagement total.

Michael von Herff
Président du Conseil d'Administration, Institut de Recherche

LETTER FROM THE CEO

Forty-one percent. That is the share of Canadians with a diagnosed mental health condition who say their care needs remain partially or completely unmet, according to the Canadian Institute for Health Information's most recent data. Not unmet because they didn't seek help. Unmet even after they entered the system.

That number stays with me. Because the question it raises isn't only about access – though access matters enormously. It's also about precision. Whether, when someone finally gets care, that care is the right care for them.

What I aspire to – and what advances in science and technology are increasingly putting within reach – is a future where a clinician can reliably offer the right care, to the right people, at the right time. Reaching that future requires a fundamental shift in how we understand and treat mental illness.

Every person's experience of mental illness or addiction is different – shaped by biology, lived experience, and a constellation of factors that resist simple categorization. Human judgment, however skilled, cannot fully navigate that complexity at scale. Part of the answer lies in our growing ability to detect patterns across large datasets, match patient profiles to known treatment responses, and move toward genuinely personalized care. Computational psychiatry is an important and emerging part of that toolkit – not the whole answer, but a powerful one, and one we are investing in deliberately.

What makes that possible is data. Through our Cardio-Neuro-Mind Data Platform – which integrates mental, neurological and cardiovascular data and serves as our contribution to ARCHIMEDES, a pan-Canadian research data initiative – we are building the foundation that precision mental health care requires. This is the architecture for a different kind of care.

No institution can do this alone. It requires an ecosystem – research and clinical care working as one, sustained philanthropic investment, national data infrastructure, and partners willing to think at the scale the problem demands. What we have built at The Royal positions us to contribute to that ecosystem in ways that reach well beyond our size. But the ecosystem itself must be

LETTRE DE LA CHEFFE DE LA DIRECTION

Quarante et un pour cent. Selon les données les plus récentes de l'Institut canadien d'information sur la santé, c'est la proportion de Canadiens ayant reçu un diagnostic de trouble de santé mentale et qui affirment que leurs besoins en soins demeurent partiellement ou totalement non comblés. Non comblés non pas parce qu'ils n'ont pas cherché d'aide. Non comblés même après avoir intégré le système.

Ce chiffre ne me quitte pas. Parce que la question qu'il soulève ne concerne pas uniquement l'accès – bien que l'accès soit d'une importance capitale. Elle concerne aussi la précision. La question de savoir si, lorsqu'une personne obtient enfin des soins, ces soins sont les bons pour elle.

Ce à quoi j'aspire – et que les avancées scientifiques et technologiques rendent de plus en plus accessible – c'est un avenir où un clinicien peut offrir de manière fiable les bons soins, aux bonnes personnes, au bon moment. Atteindre cet avenir exige un changement fondamental dans notre façon de comprendre et de traiter les maladies mentales.

L'expérience de chaque personne face à la maladie mentale ou à la dépendance est différente – façonnée par la biologie, le vécu et une constellation de facteurs qui résistent à toute catégorisation simple. Le jugement humain, aussi habile soit-il, ne peut naviguer pleinement cette complexité à grande échelle. Une partie de la réponse réside dans notre capacité croissante à détecter des tendances dans de vastes ensembles de données, à associer les profils des patients aux réponses thérapeutiques connues, et à progresser vers des soins véritablement personnalisés. La psychiatrie computationnelle est une composante importante et émergente de cette trousse d'outils – pas la réponse complète, mais une réponse puissante, dans laquelle nous investissons délibérément.

Ce qui rend cela possible, c'est les données. Grâce à notre Plateforme de données Cardio-Neuro-Mentales – qui intègre des données en santé mentale, neurologique et cardiovasculaire et constitue notre contribution à ARCHIMEDES, une initiative pancanadienne de données de recherche – nous construisons les bases nécessaires aux soins en santé mentale de précision.

resourced and protected, at a time when science funding in both Canada and the United States faces real uncertainty. The opportunity is here. So is the urgency.

In the following pages, you will find evidence of a remarkable year. I invite you to read it with a larger frame in mind: every study, every new treatment, every data partnership is a step toward a future where that 41 percent becomes a much smaller number.

Because Research is Care.

Sincerely,



A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke.

Florence Dzierzinski, PhD
President & CEO, Research Institute
Vice President Research, The Royal

C'est l'architecture d'un type de soins différent.

Aucune institution ne peut y parvenir seule. Cela exige un écosystème – la recherche et les soins cliniques fonctionnant en synergie, des investissements philanthropiques soutenus, une infrastructure nationale de données et des partenaires prêts à réfléchir à l'échelle que le problème exige. Ce que nous avons bâti au Royal nous positionne pour contribuer à cet écosystème de manières qui dépassent largement notre taille. Mais l'écosystème lui-même doit être soutenu et protégé, à un moment où le financement de la science, tant au Canada qu'aux États-Unis, fait face à une véritable incertitude. L'occasion est là. Tout comme l'urgence.

Dans les pages qui suivent, vous trouverez la preuve d'une année remarquable. Je vous invite à en prendre connaissance avec une perspective plus large à l'esprit : chaque étude, chaque nouveau traitement, chaque partenariat de données est un pas vers un avenir où ce 41 pour cent deviendra un chiffre bien plus petit.

Parce que La Recherche, C'est les Soins.

Sincèrement,

Florence Dzierzinski, Ph. D.

Présidente et Cheffe de la direction, Institut de Recherche
Vice-présidente à la recherche, Le Royal

Executive Summary

There still is no simple test to diagnose mental illness. And the same illness can present very differently from one patient to the next. With all that we already know about mental illness, there is so much more to learn. But the advancements clinicians and scientists have made here at The Royal, and around the world, are putting the right care, for the right person, at the right time within reach.

For years, the Research Institute has been investing in the people, the technology, and the environment to allow a focused team to do work typically associated with much larger organizations and, increasingly, to lead. The pages that follow show how far we have come.

Today, 69 researchers, including 24 scientists and clinician-scientists, work alongside nearly 250 learners. We support 41 active interventional clinical trials. Research investments have grown by roughly a third in less than a decade, and The Royal is again named among Canada's Top 40 Research Hospitals.

Strategically, the most important story of the year is the integration of major platforms into a coherent learning health system: the Brain Imaging Centre, Interventional Psychiatry, the Cardio-Neuro-Mind Data Platform, ARCHIMEDES, Epic research integration, the Research Recruitment Registry, and emerging AI governance structures.

The Brain Imaging Centre continues to develop as a regional and national asset, with 1,200 research scans completed in the year, 42 researchers using the Centre across 12 hospitals and research institutes, and Canada-first tri-modal MRI-PET-EEG capability moving from vision to implementation. The upcoming installation of the Siemens Biograph One scanner represents a generational infrastructure renewal that will support the next decade of discovery and care.

Interventional Psychiatry is also emerging as a central vehicle for translating research into access to specialized care. The program now brings rTMS, ketamine, and ECT into a more coordinated pathway and is developing a data registry to support longitudinal learning. The BMO Innovative Clinic for



Depression, Neuromodulation Research Clinic, Cognitive Health Research Clinic, Clinical Sleep Research Unit, and Music and Mental Health Research Clinic all demonstrate how research platforms can create new treatment options for patients and families while generating knowledge for the broader field.

At the same time, our portfolio of treatments has expanded. Stellate Ganglion Block for PTSD progressed this year from a single client conversation to a randomized clinical trial to a developing research clinic at The Royal. The Interventional Psychiatry Program now coordinates rTMS, ketamine, and ECT into one evidence-informed pathway, with IV ketamine added as compassionate care this year. Cognitive remediation in virtual reality is reaching patients with psychosis-spectrum conditions in their own homes. The new Academic Committee, co-chaired by IMHR's President & CEO and The Royal's Chief of Staff, is working to shorten the time between discovery and standard practice. And a trial with Mobia Health Innovations aims to bring structure to waitlists.

The research community is taking notice. For instance, **Dr. Rébecca Robillard** was appointed to a new OAHN-University Research Chair in Sleep and Mental Health. We hosted Brain Canada's regional consultation on AI and neuroscience and participated in the corresponding policy briefing on Parliament Hill. And the foundations are now laid for the Ottawa Mental Health Council, an ambitious initiative to extend the learning health system across the region.

None of this is possible alone. Step-changes in mental health research require step-change investment from those who believe in the work. Brain Canada's support of tri-modal brain imaging. BMO's gift powers the Innovative Clinic for Depression. The Waverley House Foundation support for our talent recruitment, building on the Emerging Research Innovators in Mental Health (eRIMh) program – funding that turned seven early-career scientists into the engine of \$37.8 million in subsequent external grants—together with support from the Associates in Psychiatry and other generous partners. And a broader community of donors has sustained this growth at every step.

That investment is now reaching a new scale. The Waverley House Foundation has returned with a \$15 million gift to fund the Waverley House Accelerator

for Mental Illness and Addiction Research now open for applications, for up to five early- and mid-career researchers. A Tier 1 CIHR Canada Research Chair recruitment is in flight. Five Clinical Research Chair searches are underway, including a Chair in Addiction – a deliberate area of growth. Each appointment unlocks a research area aligned to The Royal's SPARQ priorities and to where patient need is most acute.

Together these new researchers will help us chase our aspiration: the right care, for the right person, at the right time. What has changed is the institute's ability to deliver it. The next chapter is about the people who will use it to its full reach.



The Clinical Brain Research Centre

A VISION FOR RESEARCH ACROSS THE CONTINUUM OF CARE

A blueprint to transform mental health and addiction care, the Clinical Brain Research Centre (CBRC) integrates research, technology, and clinical practice across the full continuum of care. By bringing innovative research directly to the point of care, the CBRC advances two of The Royal's key priorities: improving access and enhancing quality.

Powered by an integrative, predictive data platform, and building on the strong foundation of The Royal's Brain Imaging Centre, the CBRC enables coordinated, evidence-based care that is responsive to individual needs. As a result, patients can access and benefit from cutting-edge research-based prevention strategies, diagnostic tools, and therapeutic interventions.

The Clinical Brain Research Centre is where science and care meet, creating a future in which research accelerates recovery, and every patient benefits from the most advanced approaches in mental health and addiction care.

CLINICAL BRAIN RESEARCH CENTRE
Integrated and coordinated platforms

INTERVENTIONAL PSYCHIATRY PROGRAM
Our umbrella approach that connects all our services for the patient

BRAIN IMAGING CENTRE
Brings together cutting-edge technology including MRI, PET and EEG scanning, powerful tools to investigate brain function, structure, and neuropsychiatric disorders.

PREVENTION
Suicide Prevention
Community
Lifestyle (Exercise, Sleep)
Music

DIAGNOSIS
PET-MRI (Bic) | Sleep | EEG Biomarkers
| Advanced Scales

INTERVENTION
Brain Stimulation
Esketamine | IV Ketamine | (Psychedelics)
ECT | rTMS-ECT | MRI Guided-rTMS
Cognitive Remediation (VR) | Sleep

CARDIO-NEURO-MIND DATA PLATFORM
Integration of heterogeneous data



Brain Imaging Centre

The Brain Imaging Centre (BIC) is a leader in neuroimaging, dedicated to advancing mental health research through cutting-edge technology and expertise. Specializing in simultaneous multimodal imaging using magnetic resonance imaging (MRI), positron emission tomography (PET), and electroencephalography (EEG) scanning, the BIC provides researchers with powerful tools to investigate brain function, structure, and neuropsychiatric disorders.

The BIC continues to build on its reputation as the go-to hub for brain imaging in the Ottawa region – and the numbers tell a compelling story. In fiscal year 2026, the Centre completed 1,200 research scans, peaking with 319 scans in the fourth quarter. That sustained, near-capacity demand reflects the growing scientific community that depends on the BIC as an essential regional resource.

A total of 42 researchers conducted scanning at the Centre this year, across 12

hospitals and research institutes across the Ottawa region. Seven new studies were approved by the BIC Steering Committee, with six returning principal investigators – a testament to the Centre’s depth of ongoing engagement. Spanning the domains of cognition, youth, music, wellness, and brain-heart interactions, these studies reflect both the scientific breadth and the collaborative spirit that define the BIC.

EXPANDING CAPABILITIES

Technically speaking, the year was marked by significant growth, innovation, and collaboration. The BIC broke new ground with a Canada-first tri-modal study integrating MRI, PET, and EEG in mood disorders – precisely the kind of complex, multidisciplinary research the Centre’s infrastructure is uniquely positioned to support. We also participated in two new studies investigating interactions between the brain and heart, expanding the Centre’s capabilities in whole-body imaging research while strengthening collaborations with the University of Ottawa Heart Institute (UOHI).

The year also reflected continued advancement in PET imaging through the implementation of the [18F]SynVesT-1 tracer to image and measure synaptic density in the living human brain. The addition of this tracer expands the Centre's ability to support advanced multimodal imaging studies while strengthening its position as a leading hub for translational neuroimaging research.

Our PET program relies on a strong collaboration with partners at the University of Ottawa Heart Institute (UOHI) Radiochemistry Laboratory where PET imaging agents (tracers) are synthesized. This Radiochemistry Lab achieved a milestone in early 2026, receiving full regulatory approval to conduct first-in-human studies with novel PET tracers. This opens the door to expanded collaboration with industry, including pharma-sponsored clinical trials requiring PET imaging. The Centre's **Dr. Hussein Bdair** works from UOHI, focused on implementation and production of PET tracers for mental health research. This year, Bdair received his certification as a Radiopharmacist and is the first person in Canada to hold this designation. Taken together, these advances create new opportunities for scientific and industry collaboration, enhance competitiveness for large-scale funding initiatives, and support the advancement of precision approaches to mental health research.

INVESTING IN THE NEXT GENERATION

To date, the Centre has played a critical role in training and mentoring more than 125 trainees across undergraduate, master's, and doctoral programs. Through access to advanced imaging infrastructure, multidisciplinary collaboration, and specialized scientific expertise, the BIC has helped foster innovative research and supported the successful completion of numerous graduate and doctoral dissertations.

Among these trainees are:

- **Dr. Patricia Burhunduli**, who applied multimodal neuroimaging approaches to better understand suicide-related thoughts, behaviours, and clinical risk factors in treatment-resistant depression.
- **Dr. Rami Hamati**, whose dual-modality PET/MRI work was highlighted

in last year's report, leveraged simultaneous PET/MRI imaging to investigate the role of the dopaminergic system in subclinical paranoia.

- **Dr. Marie Huc**, who used simultaneous EEG and fMRI to investigate distinct and overlapping neural features in males and females, and their relationship with sex hormones and the stress hormone cortisol.
- **Dr. Rami Al Haddad**, who examined developmental changes in the dopamine system from childhood into adulthood using neuromelanin-sensitive MRI.

Together, their work advances our understanding of the brain – and reflects the Brain Imaging Centre's commitment to building the next generation of researchers who will carry that work forward.

Interventional Psychiatry

WHEN STANDARD TREATMENT ISN'T ENOUGH

For most people living with depression or other serious mental illnesses, established treatments – medication, psychotherapy, or a combination of both – offer a path toward recovery. But for a significant subset of patients, those treatments fail. And when they do, the conventional system offers little in the way of a coordinated next step. Patients return to their referring physician, wait for a new referral, and begin the process anew – often without any deeper understanding of why the first treatment didn't work or what might be more likely to succeed.

This is the problem Interventional Psychiatry (IP) at The Royal was designed to solve. Interventional Psychiatry is a rapidly evolving clinical subspecialty that uses specialized modalities and procedures, including brain stimulation and drug delivery, to provide rapid treatment for difficult to treat psychiatric disorders. It involves specialized equipment, training, and integration of research and clinical teams. At The Royal, Interventional Psychiatry coordinates the treatment and flow of patients living with difficult to treat mental illness through multiple specialized modalities. Rather than trying each intervention in isolation, we are creating a structured, evidence-informed pathway right from the beginning, which will offer important value to The Royal's new Urgent Care Clinic.

The program serves as an umbrella for a coordinated set of advanced clinical and research services, bringing together the Neuromodulation Research Clinic, the BMO Innovative Clinic for Depression, and electroconvulsive therapy (ECT) clinical services under a single, integrated framework. Its three pillars are clinical care, research, and education – each reinforcing the others. By tightly linking treatment delivery with scientific inquiry and training, IPP creates an environment where emerging evidence can be rapidly evaluated and put into practice, and where the clinicians of tomorrow learn alongside the patients of today.

The treatments offered – repetitive transcranial magnetic stimulation (rTMS), intranasal esketamine, intravenous ketamine, and ECT – are evidence-based interventions for some of the most severe presentations in psychiatry, available in a monitored, safety-focused academic environment. A key question driving the program's research agenda is not simply whether these treatments work, but for whom, and why – and how their benefits can be prolonged, personalized, and made more equitably accessible.

Our vision is to include brain imaging in the treatment process, giving clinicians meaningful data about how a patient's brain is functioning before treatment begins and how it changes with treatment – information that can help guide which intervention to try first, rather than relying on trial and error. If that treatment is unsuccessful, IP can route the patient to the next appropriate option from within the program, without requiring them to return to their referring physician and restart the referral process. The result is a more coherent, less frustrating, and potentially faster path to effective care for patients who have already waited long enough.

This past year marked significant progress on the infrastructure front. A major milestone was the development of the Interventional Psychiatry Data Registry, a new initiative designed to securely capture and integrate clinical and research data across IP services. The registry will enable longitudinal analysis of treatment outcomes, patient characteristics, and care pathways – accelerating learning across the program and facilitating collaborations with external partners. The Fellowship Program also launched its first cohort of fellows – with two additional fellows expected in early autumn 2026 – a specialized workforce trained in neuromodulation and emerging psychiatric treatments. Monthly Lunch & Learn sessions now bring together clinicians, researchers, trainees, and program staff to discuss emerging findings and innovative approaches to treatment delivery.

Looking ahead, the full implementation of the Data Registry and continued growth of the fellowship program will position Interventional Psychiatry as a regional hub for innovation in treatment-resistant mental illness – one where clinical care and research advance together, in service of patients who have run out of other options.

Neuromodulation Research Clinic

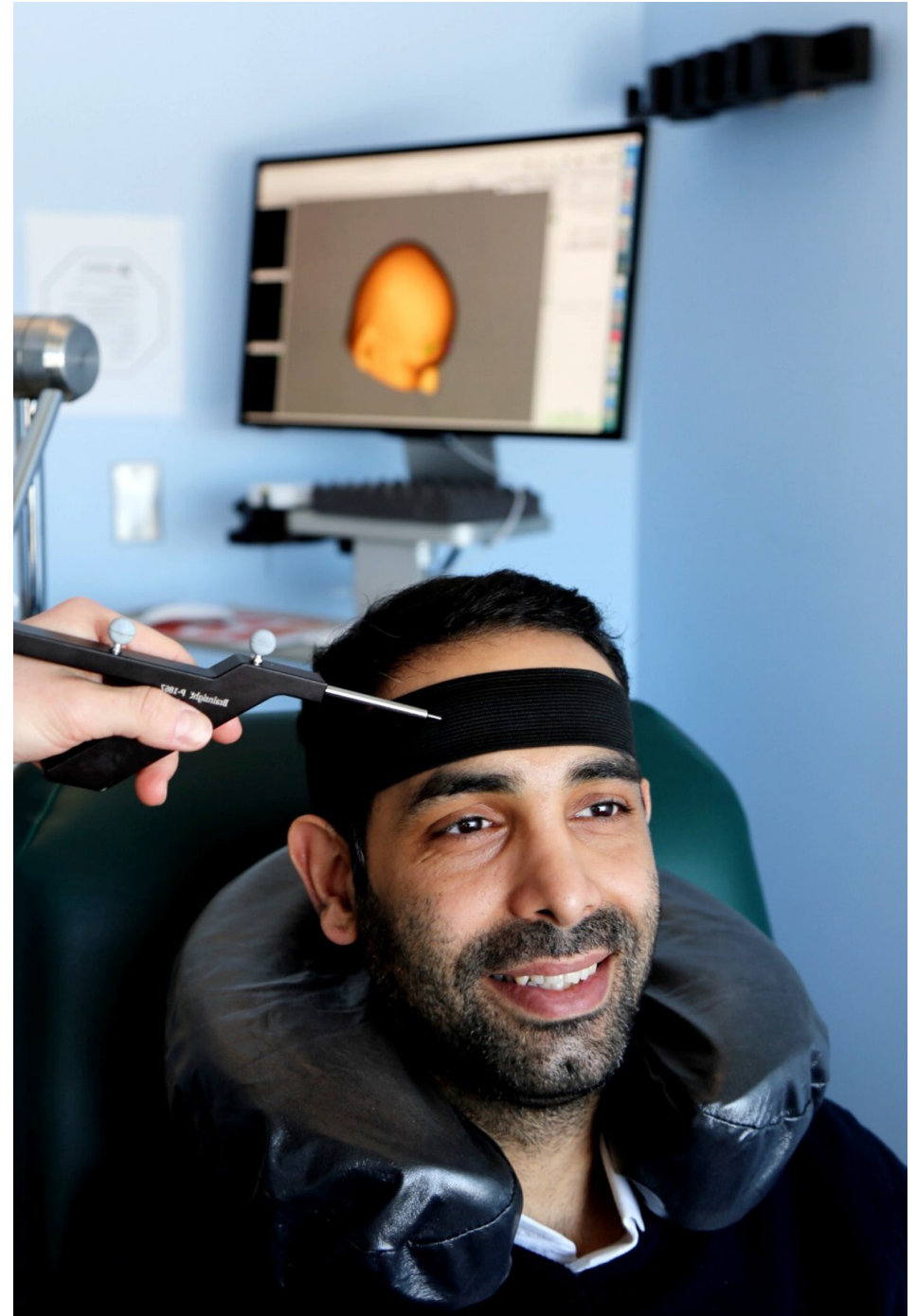
ADVANCEMENTS IN RTMS FOR TREATMENT-RESISTANT DEPRESSION

Many people living with difficult-to-treat depression have tried medication after medication without lasting relief and think that their treatment options have been exhausted. The Neuromodulation Research Clinic, led by **Dr. Sara Tremblay**, is a source of optimism for many: access to repetitive Transcranial Magnetic Stimulation (rTMS), an evidence-based treatment that works by stimulating targeted regions of the brain using magnetic pulses. By addressing a population with limited therapeutic options, the clinic fills an important service gap within the mental health care system.

The past year has been one of significant growth. After a period of relatively stable referral activity in the early years of operation, demand accelerated significantly – with referral volumes more than quadrupling over the past several years. This growth reflects increased awareness of rTMS among referring providers and improved integration within clinical pathways. In response, the clinic has expanded its physical space and clinical infrastructure, hired a fourth rTMS technician, and will be acquiring a fourth rTMS machine – increasing treatment capacity while maintaining quality and safety standards.

The clinic's research program is generating findings that are reshaping how rTMS treatment is understood and optimized. A new publication in the *Journal of Affective Disorders Reports* demonstrated that theta burst stimulation – a form of rTMS – significantly improves sleep quality, ease of awakening, and daytime wakefulness in individuals with major depressive disorder, independent of mood improvement. This suggests rTMS may directly target neural circuits involved in healthy sleep regulation, expanding its clinical value beyond symptom reduction alone.

The team also identified two important predictors of treatment response. Emerging analyses revealed higher response rates among female participants, prompting ongoing work to understand and address sex differences in rTMS outcomes. And in findings published in the *Journal of Affective Disorders*, baseline physical activity emerged as a striking predictor of success: over

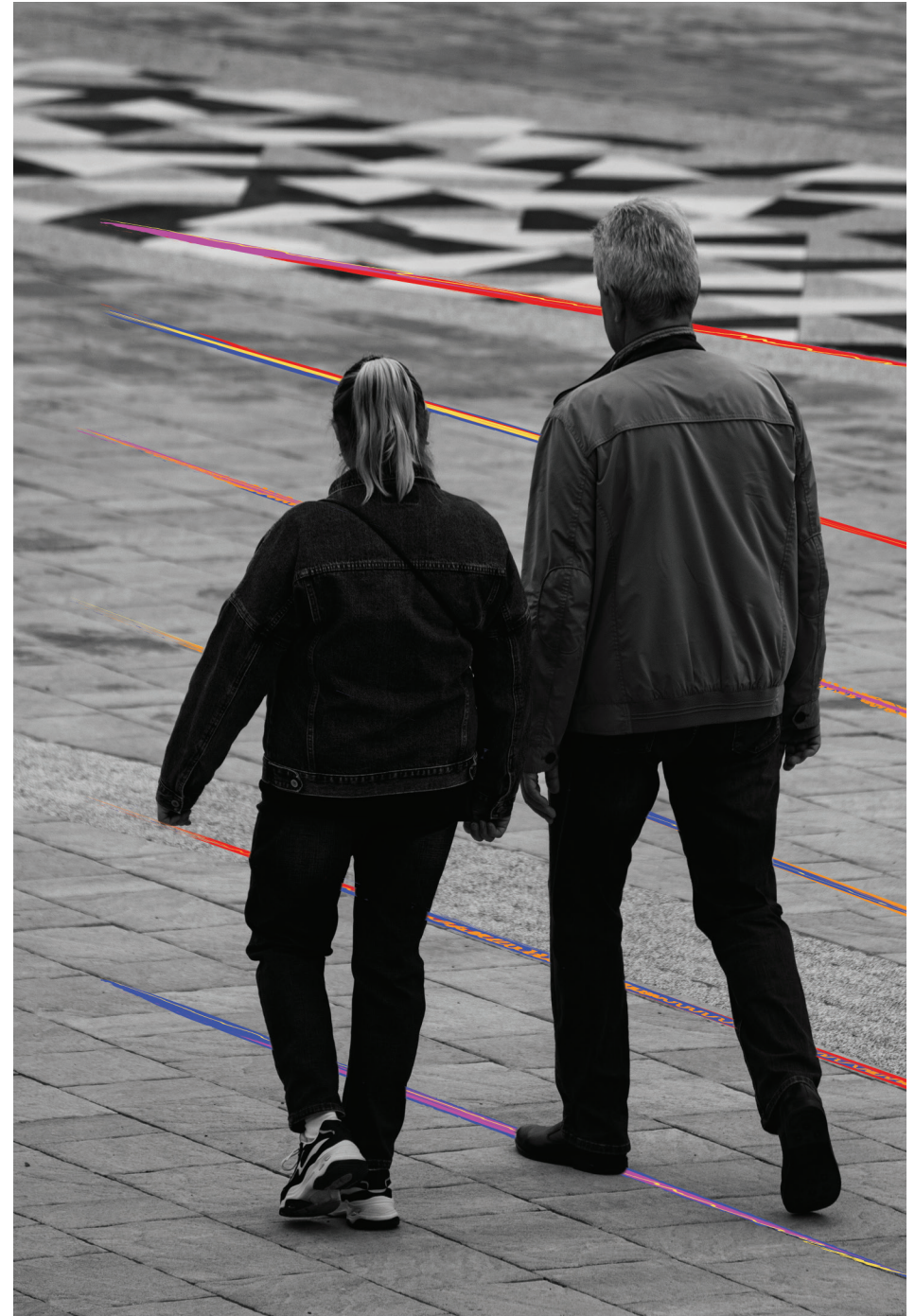


80% of physically active participants responded to treatment, compared to approximately 30% of inactive individuals. These discoveries have directly informed a newly funded trial introducing structured exercise as a priming strategy to enhance rTMS response, with the first participant expected to enroll in March 2026.

For patients, the impact of treatment can be profound. One participant described their experience this way:

“After 35 years I finally feel alive and I am so grateful. It is worth trying this as an option. I have felt better than I have ever felt with meds alone. In the past on meds even my ‘well’ was terrible. I feel so different after TMS. The engagement is so obvious. The team seems to genuinely care. It’s very well organized and the explanations are detailed and helpful.”

Looking ahead, the clinic expects to play a leadership role for rTMS treatment in the region, building a more precise, equitable, and outcomes-driven model of care – one in which rTMS delivery is increasingly tailored to the individual. The clinic will also continue its role in the broader development of Interventional Psychiatry, including fellowship and residency training initiatives that are building the next generation of practitioners in the field.





BMO Innovative Clinic for Depression

A FASTER PATH THROUGH THE DARKNESS: KETAMINE AND THE FUTURE OF TREATING DEPRESSION

For people living with moderate to severe treatment-resistant depression, the standard options have often already failed them: medications tried and abandoned, psychotherapy attempted without lasting effect, and for some, persistent suicidal thoughts that make the wait for relief feel unbearable. The BMO Innovative Clinic for Depression, led by **Drs. Jennifer Phillips** and **Jeanne Talbot**, was established to meet this need, providing access to ketamine-based treatments that can work more rapidly than traditional antidepressants and may reduce suicidal thinking, offering hope to patients in acute distress.

The clinic uses both intravenous (IV) ketamine and intranasal esketamine to treat major depressive disorder and bipolar depression, within an academic research environment: no other local providers, and very few additional

centres in the province, provide these treatments. Its research focuses on key questions: How effective are these treatments in real-world clinical care? Why do some patients respond while others do not? And how can ketamine's benefits be prolonged? Using clinical trials, biomarker studies, and neuroimaging, the clinic is working to better understand treatment response and move toward personalized care.

Over the past year, the clinic received 25 referrals for intranasal esketamine and 52 for IV ketamine – the first full year offering IV ketamine, with strong referral volume and engagement. In total, 11 patients initiated esketamine treatment and 14 began IV ketamine. Research participation is central to the clinic's model of care: all 11 esketamine patients consented to research participation, along with 21 individuals pursuing IV ketamine. The clinic does not maintain a waitlist, allowing timely access to care for eligible patients. In April 2025, we launched a new clinical trial, funded by the American Foundation for Suicide Prevention, of IV ketamine for treating suicidal ideation.

The clinic also welcomed a new PhD student, **Areebah Ahmed**, whose work focuses on ketamine and neuroimaging.

Early findings from the IV ketamine study showed meaningful reductions in the severity of suicidal ideation, supporting evidence that ketamine may provide rapid relief for high-risk patients. Research into physical biomarkers associated with response to intranasal esketamine has revealed that inflammatory and metabolic factors are common in individuals with treatment-resistant depression, and emerging analyses suggest these biomarkers may inform how patients respond to treatment – a discovery that contributes to a broader move toward more personalized, biologically informed care. The clinic also observed differences in accessibility: uptake of esketamine versus IV ketamine appears to be affected by cost and insurance coverage barriers, highlighting the importance of addressing systemic factors to ensure equitable access.

Participants have described the experience in terms that go beyond clinical outcomes. One said:

“IV ketamine allowed brief but very critical moments of reprieve during a period of crisis and enduring emotional agony, where other coping methods were failing. I felt so mentally incapacitated that I couldn’t conceive of solutions or hope to guide my decision making. IV ketamine allowed temporary access to an emotional state where this type of reflection and strategizing was possible.”

Another described participation as simply “life changing.” A third noted: “The team was incredibly kind, patient and accommodating. They made me feel very comfortable in what has the potential to be very uncomfortable circumstances.” All participants said they would recommend participation in research to a friend or family member.

Looking ahead, the clinic is preparing to launch a clinical trial pairing IV ketamine with structured psychotherapy – combining rapid-acting biological

treatment with targeted psychological support to maximize and prolong the benefits of ketamine. A third IV ketamine study examining biomarkers and neuroimaging patterns associated with treatment response is also planned. Progress is possible when clinical care and research advance in tandem; what’s more, the patients who participate in this work contribute not only to their own recovery but to knowledge that may benefit many others.

Clinical Sleep Research Unit

REDEFINING RECOVERY: SLEEP AS A PILLAR OF MENTAL HEALTH CARE

Up to 90% of people living with mental health conditions also experience significant sleep disturbances. Yet sleep problems are still too often overlooked in mental health care, despite their profound impact on emotional regulation, cognitive functioning, cardiovascular health, and long-term recovery. The Clinical Sleep Research Unit is working to change that.

Led by **Dr. Rébecca Robillard**, the unit's purpose is to understand how sleep and mental health interact – and to translate that knowledge into accessible, personalized care that improves outcomes for patients and families. Sleep is a cross-cutting priority within our Strategic Research Plan, visible across the full range of conditions the team investigates: how disorders like insomnia and sleep apnea intersect with psychiatric and neurological conditions, from depression and PTSD to concussion and bipolar disorder. A central question guides the work: can improving sleep change the trajectory of mental illness? More specifically: how do sleep disturbances alter brain and heart functioning during the night? Are there shared mechanisms across different mental disorders? Which interventions work best for which patients, and why?

To answer these questions, the unit combines advanced brainwave analysis, heart-brain coupling measures, wearable sleep technology, and real-world data collected in both clinical and community settings. This year, that approach produced findings that challenge established assumptions in the field.

In a study of cognitive behavioural therapy (CBT) for insomnia, preliminary results showed that over just five weeks, treatment significantly reduced not only insomnia symptom severity but also clinician-rated depression symptoms, improvements that persisted at a one-month follow-up. Tracking progress using novel brain-based sleep monitors allowed participants to see, in real time, a progressive shift toward deeper sleep – something neither patients nor researchers had been able to observe before. For many, that visibility was itself part of the treatment. One participant described it this way:

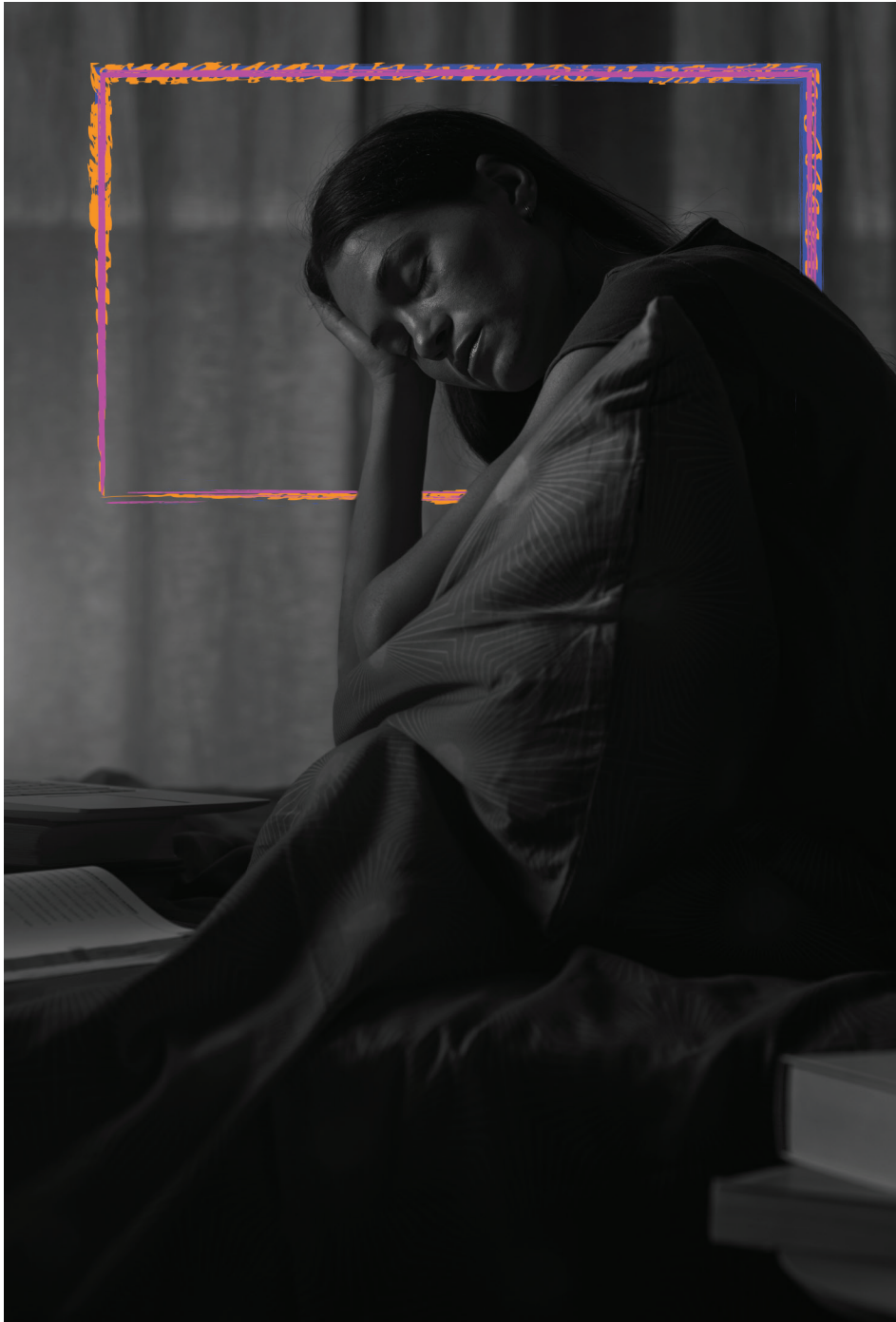
“For me, as long as I had some sort of pinpoint out there somewhere to say: ‘no, you’re going in the right direction,’ then I can get through anything.”

Another participant noted the value of having their perceptions corrected: “I find it quite helpful when the sleep tracker data tell me that yes, I woke up several times but actually slept more than I thought.”

These same monitoring tools enabled a scientific discovery: the current prevailing model of insomnia phenotypes may need to be revised to account for considerable day-to-day variability; what's more, the team suspects this phenomenon is especially critical for people with insomnia comorbid with mental disorders. The research also found that interactions between the brain and heart at night may serve as novel biomarkers of insomnia and depression, with potential to refine how patients are matched to treatments.

The unit's reach extended in unexpected directions this year. By integrating sleep apnea screening into clinical research with youth experiencing complex, treatment-resistant conditions, as well as with veterans living with long-term PTSD, research revealed that approximately 40–50% of participants had unsuspected, undiagnosed sleep apnea. For many, successful treatment led to marked improvements in mental health and cognitive functioning. One veteran said that before his participation in a research study identified his sleep apnea, he had thought he was on his way to Alzheimer's disease – and that treatment had been a game changer, restoring his thinking skills. The unit also ran a public health campaign on the effects of time changes, which research shows disproportionately affect people with mental health conditions; it reached more than 7,300 people.

Looking ahead, a key goal is to integrate additional technologies and approaches to develop novel intervention arms. Sound-based neurostimulation to boost sleep slow waves during the night is being validated this year and is expected to be ready for deployment in clinical populations by summer.



The team is also developing sleep-focused meditation interventions that incorporate elements targeting both mental health and autonomic dysfunction. Brain-heart activity profiling will be used to propose refinements to current subtyping of sleep disorders, with the aim of improving prediction of treatment outcomes. A physiological and experiential tracking system is being developed to predict the emergence of mood episodes in people with bipolar disorder, and novel sleep apnea screening tools will be implemented with patients in the substance use and concurrent disorders program. Across all of this, the unit remains committed to training the next generation of clinician-scientists and building capacity to widen the scope of sleep care provided at The Royal.

Read more about sleep in Robillard's contributed column to the Globe & Mail, including this article: [How to get your sleep schedule back on track after a time change.](#)



Music and Mental Health Research Clinic

THE HEALING POWER OF MUSIC: FROM COMMUNITY HALLS TO CLINICAL CARE

Mental health treatment has long been defined by prescriptions. The Music and Mental Health Research Clinic is asking what else clinicians might offer – and finding that music, rigorously studied and thoughtfully delivered, has the potential to reshape how care is experienced.

Under **Dr. Gilles Comeau**'s leadership, the clinic's mission is to study the interaction between music and mental health, and to develop evidence-based practices that can improve the wellbeing of individuals and communities. Its work pursues three interconnected goals: understanding the neurobiological mechanisms that explain the benefits of music-making on mental health; identifying individualized approaches by determining what works, for whom, and in what settings; and acquiring knowledge on the long-term effects of music intervention. Underlying all of it is a commitment to a more holistic,

interdisciplinary model of care – one that brings together creative expression, physical activity, and social connection.

The scale of the clinic's operations this year reflects a program that has grown well beyond its origins. Across 27 groups in total – 23 music and movement programs and 4 others including guitar and choir – the clinic is delivering weekly community classes to approximately 270 participants at sites spanning The Royal and locations across Canada and internationally. Enrollment has expanded significantly, with nearly 100 research participants added in the Fall 2025 term alone. Three additional sites are expected to launch in the coming months.

Much of this year's work has focused on building the infrastructure to sustain and replicate that growth. The team has developed standardized materials and remote training sessions for research assistants and music instructors and has successfully launched research sites at 10 locations outside of Ottawa. Qualitative data from participant interviews has been overwhelmingly positive, and analysis of self-report questionnaires measuring depression, anxiety, social isolation, mental wellbeing, and affect is currently underway.

What participants and staff describe goes beyond symptom relief. At the Vanier Community Service Centre, social worker Jennifer Leclaire observed that the music and movement program accomplished something years of other programming had not: “It has really brought us closer to seniors, and be able to see what is going on with them in ways that no other program that we have tried to offer has done.” Participant Christine Dingwall put it simply: “Through this program, I have gained more friendship – it’s really a social activity.”

At the Regional Psychosis Clinic, a Friday music group has become a weekly highlight for both staff and clients. Social worker Vanessa Morel described what sets it apart:

“In some older and traditional models of health care, sometimes the clients or patients have been led to feel like the recipients of care and staff have been seen as the experts. I like how this group equalizes some of the potential power imbalances.”

Participants bring their own talents, take the lead, share songs they have written, and receive genuine encouragement in return. “Client participants have the opportunity to shine and share their strengths and talents,” said Morel.

The year ahead will be one of significant expansion and knowledge mobilization. In May 2026, the clinic hosted a three-day study session bringing together researchers, music educators, health practitioners, and community partners. Next up is a six-episode podcast series, featuring international researchers and practitioners, and a two-day hybrid international conference is planned for November 2026. On the research side, data collection will expand to include new objective measures capturing physiological responses, mobility and balance, movement patterns, and brain activity. In the coming year, Comeau and the team are planning new music and movement research sites in Halifax, Japan, and Switzerland – extending the clinic’s reach to a genuinely global scale.



Cognitive Health Research Clinic

THINKING SKILLS MATTER: CLOSING THE COGNITIVE GAP IN MENTAL HEALTH CARE

Mental illness affects far more than mood. For most people living with a psychiatric condition, cognitive challenges such as difficulties with memory, attention, problem-solving, and daily functioning are among the most debilitating and least-addressed dimensions of their illness. These impairments have a direct impact on employment, relationships, and quality of life, yet current treatments often overlook them entirely, leaving a critical gap in comprehensive care.

The Cognitive Health Research Clinic, led by **Dr. Synthia Guimond**, exists to close that gap. The clinic provides timely cognitive assessments and evidence-based cognitive interventions for people living with psychiatric conditions, with the goal of improving long-term recovery and eventually incorporating these interventions into standard care. The work examines the effectiveness of various cognitive interventions at improving cognition and function in diverse clinical populations, and whether these interventions are feasible and accessible across different settings and populations.

This year, the clinic has been actively enrolling participants across three clinical trials, each targeting a distinct population. The first developed a virtual reality-based cognitive remediation program in collaboration with healthcare professionals and individuals with lived experience of a psychosis-spectrum disorder. Twenty-four patients completed a randomized controlled trial assessing the feasibility, acceptability, and efficacy of the program, and showed general improvements in psychosocial functioning and functional capacity. A second trial provides remote delivery of action-based cognitive remediation and metacognitive training for 32 individuals with schizophrenia and psychosis-spectrum disorders; data collection will conclude by summer 2026, yielding preliminary evidence on the efficacy of online delivery. A third trial – serving a transdiagnostic population that includes individuals with psychosis, substance use disorders, and PTSD – examines cognitive remediation for individuals found not criminally responsible due to mental disorder, with the



aim of improving rehabilitation outcomes and reducing factors associated with reoffending.

A key insight emerging from this work is the promise shown by virtual reality as a treatment environment. Immersive settings that replicate cognitively challenging real-world scenarios can increase engagement and potentially improve the transfer of cognitive gains to everyday functioning. Virtual reality allows patients to practice and develop the same skills repeatedly in a safe environment before incorporating them into their daily lives – bridging the gap between clinical intervention and practical application in a way that traditional approaches cannot.

Participants have spoken to this directly. One described how the online virtual cognitive remediation group impacted not only their cognitive skills, but also their social functioning:

“It provided a lot of thoughtful discussion with the group members, and it allowed me to organize my days better, whether that be relationships with people or trying out day-to-day activities. It allowed me to help manage my time a little bit better and be more proactive in determining things that are important to me in a given day. My memory skills improved in terms of multi-tasking, and just some of my relationships and ability to understand certain social cues.”

They also said they would recommend the program without hesitation: “The activities in the group were able to transfer to real-life circumstances.”

Looking ahead, the clinic’s vision is centred on the accessibility, efficiency, and scalability of cognitive care. The team aims to develop brief and impactful treatments that can be delivered at lower cost, while reducing waitlists to address increasing demand. A new clinical trial examining action-based cognitive remediation in a transdiagnostic population will begin recruitment in the spring, representing the clinic’s commitment to cutting-edge, scalable interventions that can be incorporated into standard care. The team is also focused on improving its visibility within The Royal – a number of clinicians have indicated they were unaware that these services exist – and on expanding outreach and referrals to ensure that patients who would benefit can access the programs.



Strategic Research Plan in Action

Strategy-Driven, Patient-Centred

Our work this year has been guided by two complementary roadmaps. In June, **Cara Vaccarino**, President and CEO of The Royal, launched [SPARQ](#), The Royal's new strategic plan built on five pillars: Sustainability, People, Access, Research, and Quality. It articulates an ambitious vision for transforming mental health and addiction care across the Ottawa region. Research is core to this vision, with a priority on integrating data-driven learning into care and accelerating the translation of discoveries into practice.

The Research Institute's Strategic Research Plan, launched in 2024, delivers on SPARQ's research priority through four goals that shape our focus and how we account for our progress:



GOAL 1

Propel The Royal's impact and profile by focusing on distinctive research in specialty areas

GOAL 2

Advance the evolution of The Royal into a rapid learning health system

GOAL 3

Reduce the gap between discovery and impact for clients, patients, families, the community and society at large

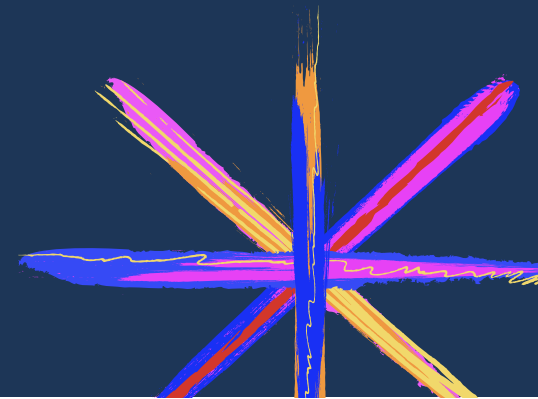
GOAL 4

Become a globally renowned academic health science centre for mental health research and innovation to amplify research impact

Our concentrations (depression and anxiety, trauma and stress-related disorders, schizophrenia and other severe and complex mental illnesses, the intersection of substance use and mental health, and mental health in equity-deserving and at-risk populations) align directly with SPARQ. Cross-cutting strengths in sleep, cognition, suicide prevention, and advanced analytics further support our capacity to translate research into personalized, evidence-based care.

The pages that follow illustrate our accomplishments over the last year to deliver against these priorities.

Goal 1: Propel The Royal's impact and profile by focusing on distinctive research in specialty areas



The Research Institute's five research concentrations bring together interdisciplinary teams with a common aim – working with patients to make lives better through research and discovery.

Depression & Anxiety

Depression is not one condition. Two people can meet the clinical criteria for a diagnosis without the same set of symptoms in common. This heterogeneity – the enormous variation in how depression presents, what drives it, and what makes it resistant to treatment – is at the heart of what our researchers are working to understand and address.

The work here spans two interconnected tracks. The first is interventional: developing and refining specialized treatments for people whose depression has not responded to conventional approaches. Interventional Psychiatry, led by an interprofessional team of clinical, research and operations experts, has translated years of research into clinical services providing access to both rTMS and ketamine. This year marked a significant milestone with the approval of IV ketamine as a compassionate care program, joining esketamine (the intranasal formulation) already in use. IV ketamine is considerably more affordable, making this an important improvement towards equitable access to specialized

care. The program is also providing regional leadership, consulting with other Ottawa-area hospitals as they develop their own interventional services.

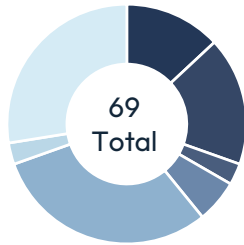
The second track is scientific: understanding the mechanisms beneath the surface. Research led by **Dr. Robyn McQuaid** explores biologically defined subtypes of depression, with the aim of matching patients to treatments more likely to work for them. **Dr. Zachary Kaminsky** has developed a screening tool that uses epigenetic markers (chemical changes that affect how genes work) to help predict when someone is at higher risk of experiencing post-partum depression. Other researchers are focused on the co-occurring symptoms – disrupted sleep, cognitive deficits – that standard treatment overlooks but that can be as debilitating as depression itself.

Looking ahead, the work is expanding beyond depression as a standalone diagnosis. Studies in development will examine the use of ketamine for suicidal ideation regardless of underlying diagnosis, and rTMS is being studied in youth populations and in people with bipolar disorder. A Research Ethics Board-approved registry has begun collecting standardized data across all interventional psychiatry services, creating a foundation for understanding who responds to which treatments and why.

Our ambition is to deliver research that shapes clinical guidelines and expands access to interventions that, for many patients, represents a lifeline.

Goal 1: Propel The Royal's impact and profile by focusing on distinctive research in specialty areas

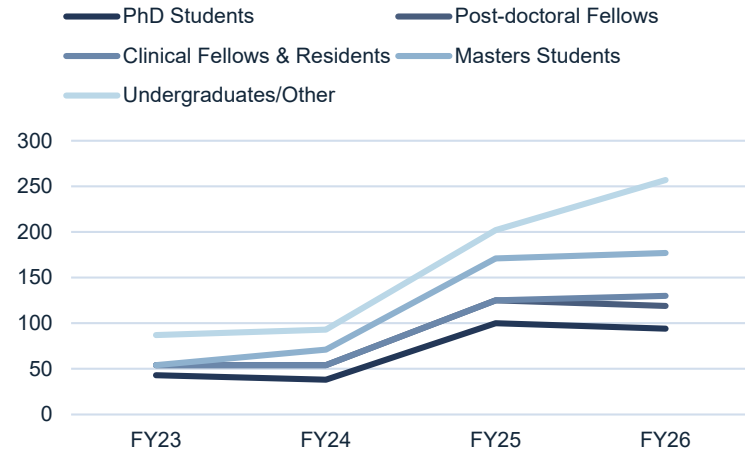
Researchers by Appointment Category



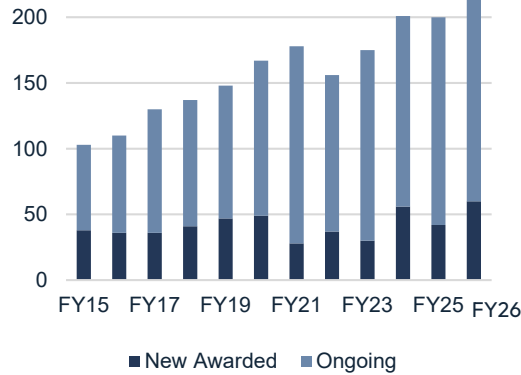
- Senior Scientists
- Assoc. Scientists
- Adjunct Scientists
- Staff Investigators
- Scientists
- Clinical Investigators
- Staff Scientists

3.52
Ratio of Research Staff/Scientists
Up 12% from FY25

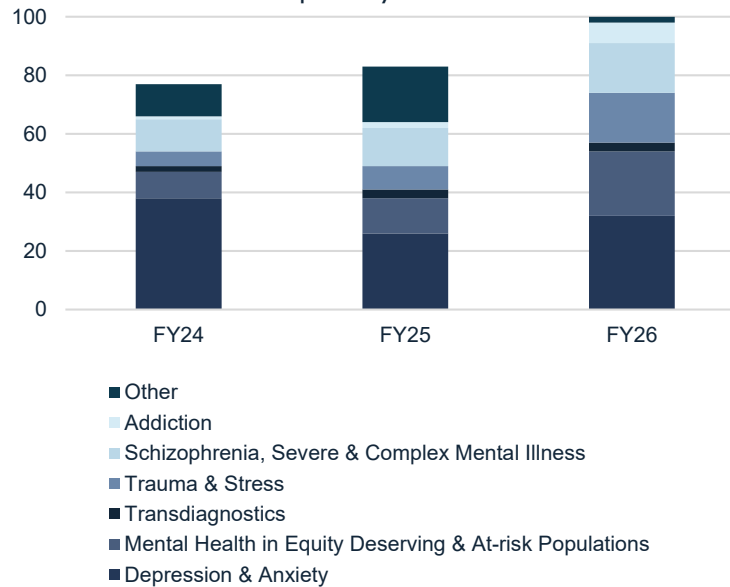
Learners by Category



Total Active Grants



Grants Submitted Per Declared Specialty



Trauma & Stress-Related Disorders

Trauma is foundational. It runs through depression, addiction, severe mental illness, and health inequity alike – not only a discrete illness but also a common undercurrent that shapes nearly every area of mental health research. As such, rather than consider trauma separately across diagnoses, we research trauma and stress-related disorders directly.

Post-traumatic stress disorder sits at the centre of this work. For example, **Dr. Jeanne Talbot**'s research investigates processing of trauma through deep brain and body systems involved in fear and emotional regulation. With **Dr. Natalia Jaworska** she is pairing a novel variant of eye movement desensitization and reprocessing (EMDR) therapy with EEG to understand the brain mechanisms underlying its effects. **Dr. Sara Tremblay** is developing a new trial examining rTMS as a treatment for PTSD – an extension of the neuromodulation work that has already transformed care for treatment-resistant depression. **Dr. Andrew Nicholson** is studying military mental health and PTSD as well as gender-based PTSD providing treatment through neurofeedback and other approaches that help regulate the brain and body after trauma.

But trauma and stress-related disorders extend further. A study now in the analysis phase examines the psychological and biological toll of burnout in healthcare workers, a population brought into sharp focus by the pandemic. Led by **Dr. Jennifer Phillips**, with co-investigators **Drs. Robyn McQuaid, Zachary Kaminsky, and Jeanne Talbot**, the study enrolled 100 licensed healthcare workers from Ottawa-area hospitals, including ICU and emergency nurses. Funded through an anonymous \$1.5 million donation via the Ottawa Community Foundation, it is among the first studies to examine whether burnout is biologically distinct from depression – not simply a variant of it. Data collection spans clinical and biological measures, including neuroimaging at the Brain Imaging Centre, with follow-ups at six and 12 months. Preliminary findings show high levels of emotional exhaustion, depersonalization, and moral distress among participants. Publications are expected in the coming year.

Moral injury – the experience of being ethically obligated to act while being systemically blocked from doing so – is a concept borrowed from military

research, and its relevance to healthcare workers has become impossible to ignore. This thread connects the work here to a broader conversation about occupational stress, resilience, and the mental health of the people who deliver care.

Schizophrenia & Other Severe & Complex Mental Illnesses

Schizophrenia has long been treated as a problem of psychosis – hallucinations and delusions that can be managed at least partially with medication. Medication cannot, however, address the cognitive deficits, loss of motivation, or difficulty ascribing value to everyday experiences that leave many people unable to work, maintain relationships, or participate fully in their own lives. Increasingly, these are the areas of focus for IMHR researchers.

On the biological side, research by **Drs. Georg Northhoff and Annemarie Wolff** identified disrupted timing in how the brain synchronizes responses to sensory stimuli as a core and potentially distinctive feature of psychosis – a finding with real implications for how schizophrenia is diagnosed and understood. **Dr. Cliff Cassidy** is probing negative symptoms, including how people with schizophrenia ascribe value and how that affects decision-making – research being conducted using brain imaging.

Dr. Lauri Tuominen is working to understand the mechanisms underlying schizophrenia, with one line of research investigating brain differences of family members of people with schizophrenia versus those without any familial tie to the illness. Shared biological vulnerability for the illness may be uncovered through his novel work using brain imaging.

Dr. Synthia Guimond's work is developing tools to treat associated cognitive impairment. Her cognitive remediation trials – using virtual reality and remote delivery platforms – are described in detail in the Cognitive Health section of this report.

Together this work aims to better understand both the biology of schizophrenia as well as better alleviate the full impact of the illness.

Mental Health in Equity-Deserving and At-Risk Populations

There is overwhelming evidence that systemic discrimination, marginalization, and stigma take a measurable toll on the mental health of minority and at-risk populations. This research pillar is grounded in that reality. Minority stress theory – a foundational framework in this field – holds that the chronic psychosocial stressors experienced by racial, ethnic, gender, and sexual minority groups compromise health through pathways shared with trauma and stress-related disorders, including hypervigilance, emotion dysregulation, and disrupted attachment. The result is elevated rates of conditions such as PTSD, depression, and suicidality among populations that are already underserved by mainstream mental health systems. Researchers at The Royal are working to move beyond documenting these disparities, toward understanding their underlying mechanisms, and ultimately, toward care that is better designed to meet the needs of those most affected.

That work takes many forms. **Dr. Andrew Nicholson** leads the multi-site Minority Mosaic Study, an ambitious mixed-methods investigation that combines neuroimaging, clinical assessments, qualitative interviews, blood biomarker analyses, and machine learning to map the neural underpinnings of minority stress across racial, ethnic, gender, and sexual orientation identities. The study, which received \$150,000 in funding from the LGBT Purge Fund in 2025, represents one of the most comprehensive efforts to date in understanding how discrimination affects the brain and body.

Dr. Kim Matheson, whose longstanding research examines stress, identity, and resilience across diverse populations, has more recently turned her attention to the experiences of Jewish Canadians. In the context of a sharp rise in antisemitism, Matheson explores how diaspora communities respond to discrimination, and what role allyship plays in supporting mental health and belonging. Together, this work reflects IMHR's commitment to research that is responsive to the communities and social conditions of our time.

Equity considerations also run through IMHR's forensic mental health research. **Dr. Michael Seto**, collaborating with researchers at the Centre for Addiction

and Mental Health (CAMH) with funding from the Ontario Ministry of Health, examined care trajectories in the Ontario forensic mental health system through an equity lens – exploring how ethnoracial status, country of birth, citizenship, and official language fluency shape the experiences of patients found Not Criminally Responsible on account of Mental Disorder.

Findings indicated that care trajectories were not significantly related to race or country of origin. However, citizenship status and official language fluency did matter. It is believed that both the availability of resources within a hospital (e.g., official language fluency) and the community (both citizenship status and official language fluency) influence outcomes. The findings have direct implications for forensic mental health policy and practice, and reflect IMHR's broader commitment to research that is responsive to the communities it serves.

Addiction

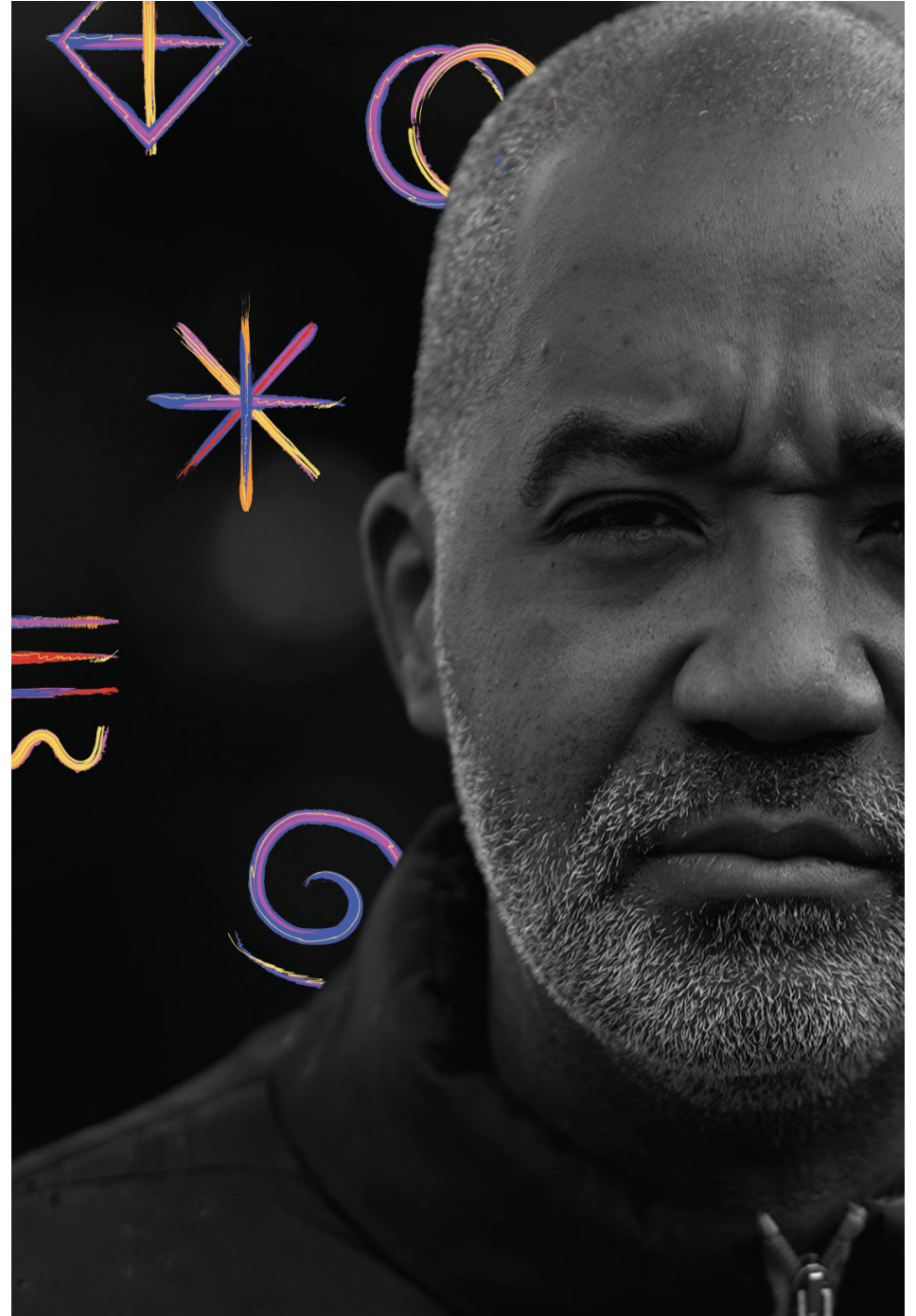
Addiction and mental illness are deeply intertwined. Research consistently shows that people living with addiction are significantly more likely to also experience mood, anxiety, or psychotic disorders – and vice versa. These conditions share common neurobiological pathways, risk factors, and lived experiences, yet for too long they have been treated as separate problems by separate systems. Addiction is a core dimension of mental health – not a parallel concern. Our research in this area investigates the complex interplay between substance use and psychiatric illness, with the goal of developing more integrated, effective, and compassionate approaches to treatment and care.

Dr. Natalia Jaworska is partnering with **Dr. Tim Moran** and other clinicians in the substance use/transitional age youth program at The Royal to offer a psychological intervention trial for young women experiencing depression, loneliness, and substance use.

Dr. Synthia Guimond has been researching problematic substance use. Her team recently published policy-informing research with significant engagement with lived experience co-authors.

This is an area of deliberate growth for the Research Institute. For instance, **Dr. Sandra Krause**, Clinical Psychologist joined The Royal's Substance Use and Concurrent Disorders (SUCD) program in the fall of 2025, and was soon after appointed a Clinical Investigator with the Research Institute. Her emerging research program focuses on understanding how trauma and anxiety interact within substance use disorders.

A search for a Clinical Research Chair in Addiction signals our commitment to building rigorous, clinically grounded capacity in this area – and to ensuring that research translates directly into better care for some of our most complex and underserved populations.



Fighting Dementia, One Good Night's Sleep at a Time

More than one million Canadians are expected to be living with dementia by 2030. **Dr. Stuart Fogel** is working to address this escalating public health crisis, leveraging his discoveries about sleep to intervene at the earliest stages – before the onset of age-related cognitive decline.

A change in sleep is the earliest indicator of dementia and researchers think one of the best opportunities to prevent onset is modifying sleep. Fogel and his team have identified unexplored therapeutic targets during sleep. Supported by CIHR, The Weston Foundation and the UMRF (over \$1 million combined), they are now targeting these markers using natural health products to restore sleep's memory-processing benefits. Ultimately, Fogel's research will provide caregivers new therapeutic tools to precisely target sleep's

key beneficial features for memory and cognition.

By enhancing sleep, we aim to mitigate and alter the trajectory of age-related cognitive decline in neurodegenerative diseases of aging.

With more than \$2.5 million in federal and provincial funding as principal investigator, Fogel's main goal is to identify biomarkers of optimal aging and leverage this knowledge to promote healthy aging. More broadly, his research focuses on how sleep functions – and dysfunctions



– affect learning, memory, cognition, daytime performance and brain health in healthy young and older adults, including those with cognitive impairment from neurodegenerative disease. Together, this body of work has helped shape the way that researchers, and the public, think about sleep: as an active participant in the formation of new memories, and potentially the fountain of youth.

Fogel employs a cutting-edge multimodal approach. As one of the team leaders of the recent \$2 million Brain Canada grant, the team is embarking on an ambitious tri-modal brain imaging line of research, harnessing the full power of simultaneous PET-MRI-EEG to monitor brain waves. As one of the only sites worldwide using simultaneous EEG-MRI during sleep, we have identified how the brain processes newly formed memories while we sleep. Most recently Fogel has embarked on using AI to decode dreams, hoping to understand the functional significance of dreaming and how it relates to cognitive function and mental health.

Talent

Our researchers work across five program types (Key Determinants of Illness, Person-tailored Care Pathways, Novel & Integrative Diagnostics & Interventions Approaches, Health Promotion & Prevention Solutions, Evidence-based Practice & Policy) and our research pillars (Depression & Anxiety, Equity-Deserving Populations, Trauma & Stress, Schizophrenia and Other Severe & Complex Mental Illnesses, Addiction, and Transdiagnostics).

Our research team grew by a net increase of two in the past year, in line with our intended growth goal, to 69 researchers, including 24 scientist and clinician-scientists. It also included almost 250 learners in the last year, comprising post-doctoral fellows, PhD and master's students, and mentees. All three PhD students recommended by the IMHR were successful this year in their application for CIHR Doctoral Research Awards: **Jennifer Cuda**, supervised by **Drs. Sara Tremblay & Rébecca Robillard**; **Emilie DuPerron**, supervised by **Dr. Natalia Jaworska**; and **Karina Fonseca**, supervised by Robillard.

TRAINING THE NEXT GENERATION OF CLINICIAN-SCIENTISTS

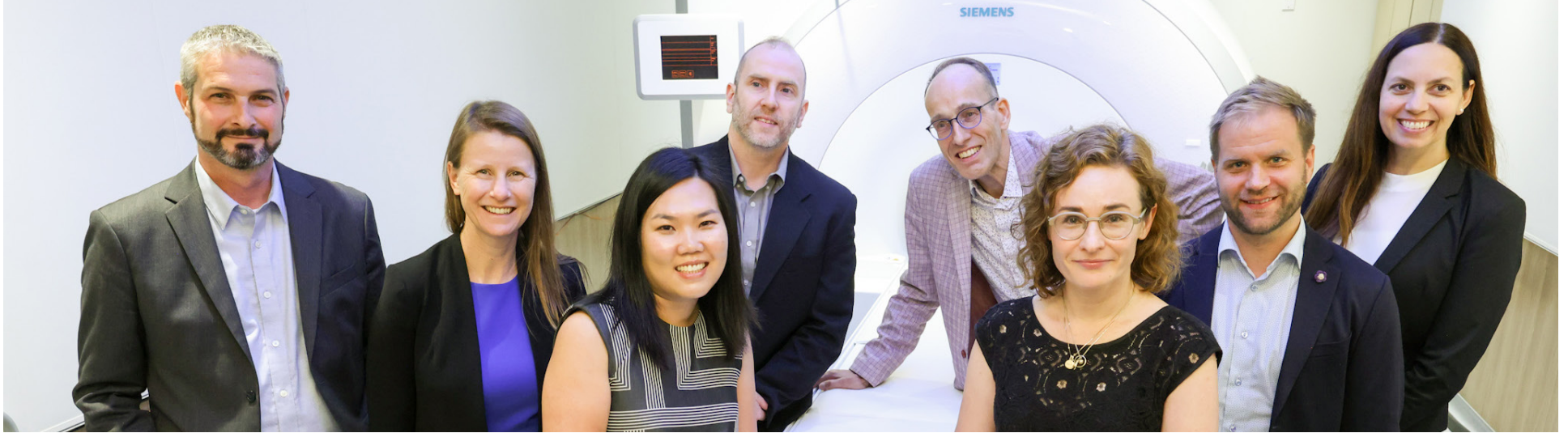
Clinician-scientists – researchers who also provide patient care – are rare. They bring a unique ability to identify questions that matter clinically and translate discoveries into treatment. One way to build this capacity is to train them from the start, integrating research and clinical education from the earliest stages of a medical career.

At the Brain Imaging Centre, our MD-PhD students do exactly that. They complete medical and scientific training concurrently, conducting dissertation projects that rely on our specialized imaging tools to explore the brain's structure, chemistry, and electrical activity. By training in an environment where research connects directly to patient needs, these future clinician-scientists develop the ability to translate scientific discovery into real-world treatment improvements.

For example:

- **Zacharie Saint-Georges** leverages [18F]FEOBV PET imaging to investigate the role of the cholinergic system in schizophrenia-related cognitive deficits, advancing our understanding of neurotransmitter systems that underlie cognitive dysfunction in psychotic disorders.
- **Bryce Bogie's** research focuses on the neural basis of cognitive impairment across a range of mental health disorders, as well as the evaluation of non-pharmacological interventions aimed at improving cognitive and clinical outcomes.

Recruiting and training new clinician-scientists is one way we continue to deepen the integration of research and care at The Royal – ensuring that the connection between discovery and treatment is built into careers from the very beginning.



CANADA AT THE FOREFRONT

A New Era in Brain Imaging

In June, we announced a milestone investment: \$1.9 million to establish the Brain Imaging Centre Advanced Multi-modal Neuroimaging Platform for Psychiatry (BIC-AMPP) at The Royal, thanks to Brain Canada's Platform Support Grants program, and matching funds from The Royal's Foundation.

The IMHR becomes one of only a few centres in the world capable of simultaneous tri-modal brain imaging – integrating MRI, PET, and EEG technologies to capture the most comprehensive picture of the living brain ever possible.

Why This Matters for Patients

Mental health research has long been constrained by our inability to see how the brain's structure, chemistry, and function interact in real time. Each imaging

technology offers a different window into the brain: MRI reveals structure and activity patterns, PET illuminates biochemistry and neurotransmitter function and density, and EEG captures the rapid electrical rhythms of neural communication. Previously, researchers could only examine these elements separately, piecing together fragmented insights.

BIC-AMPP changes everything. By integrating the three modalities simultaneously, our researchers can now observe how these different levels of brain function interact – and how those interactions may be disrupted in mental illness. This holistic understanding opens new pathways toward earlier, more accurate diagnoses and treatments tailored to an individual's unique brain.

By integrating multiple imaging modalities, we can move beyond fragmented insights toward a more holistic picture of mental illness – one that will inform better, more personalized treatments and, ultimately, help reclaim lives.

Expanding Our Research Horizons

In the months since the announcement, the platform has moved swiftly from vision to reality. The team has expanded considerably through the recruitment of highly specialized expertise, including Staff Scientist **Dr. Paul Gravel**, whose work strengthens advanced PET imaging and analysis capabilities; Postdoctoral Researcher **Dr. Andrea Buccellato**, bringing expertise in temporal EEG analysis and multimodal integration; and AI Engineer **Kerry Cerqueira**,



supporting the development of advanced computational and artificial intelligence workflows. **Dr. Lydia Fang** has been promoted as a Staff Scientist in recognition of her expertise in combined MRI and EEG acquisition and analysis.

Soon, simultaneous multimodal brain imaging will be able to guide brain stimulation therapy for depression, deepen understanding of the neural circuits involved in psychosis and suicide risk, and reveal the complex relationships between sleep and mental health. The flagship research project, with full participant recruitment planned for later in 2026, applies simultaneous tri-modal imaging to neuropsychiatric disorders. In parallel, the team is developing joint-analysis methods for existing multi-modal datasets and integrating artificial intelligence into the imaging analysis pipeline – work that will sharpen the quality and speed of discovery.

The data generated through BIC-AMPP flows into our Cardio-Neuro-Mind Data Platform, making it available to researchers worldwide and creating ripple effects of discovery far beyond our walls. Community engagement is well underway, with a monthly Neuroimaging Seminar Series connecting the regional neuroimaging community, Scientific Computing Workshops in development, and early planning underway for a Fall 2026 Ottawa Neuroimaging Retreat.

This investment from Brain Canada and our donors will have a long tail, and positions The Royal, the Ottawa region, and Canada at the forefront of brain imaging research for mental illness and addiction.

INVESTING IN OUR FUTURE: A NEW BRAIN IMAGING SCANNER

A core technology in our tri-modal imaging capability is our brain imaging scanner. Our Siemens Biograph mMR scanner is one of only a handful of simultaneous PET/MR scanners in Canada and the only one situated in a mental health centre; it has been instrumental in attracting research talent, enabling landmark studies, and supporting philanthropic investment.

Since opening in 2016, the Brain Imaging Centre has been central to the IMHR's growth and to The Royal's identity as a research-intensive hospital. With more than 6,000 scans completed over 10 years, the facility has enabled groundbreaking work spanning mental health, addiction, aging, neuroscience, and brain-body interactions.

More than 40 papers using BIC data have been published, many in high-impact journals including Neuroimage, Biological Psychiatry, and the Proceedings of the National Academy of Sciences. This year, the BIC has become a University of Ottawa Core Facility, serving 42 scientists and clinician scientists across the Ottawa Academic Health Network.

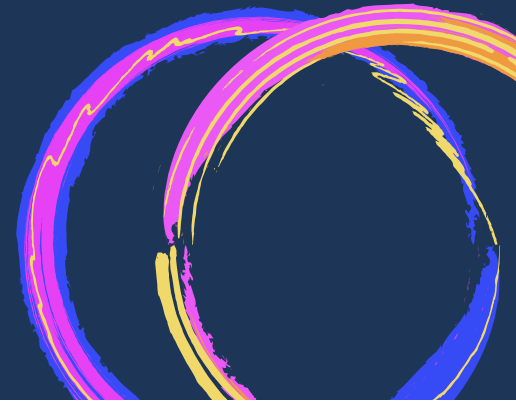
This summer, a new Siemens Biograph One scanner will be installed, the first of its kind in Canada. It will position the BIC at the forefront of next-generation molecular and multimodal imaging. The new system offers substantial advancements in imaging sensitivity, acquisition speed, and data quality, significantly improving both the participant experience and research capability. Shorter scan times will reduce participant burden while increasing throughput and operational flexibility.

This core asset enables programs like Interventional Psychiatry and brain-imaging guided neuromodulation trials and is integral to our simultaneous tri-modal imaging platform. About 70% of our researchers are direct users of our scanning technology.

This investment by The Royal and its philanthropic partners reflects a long-term commitment to advancing brain and mental health research in Canada. More than a replacement of equipment, the new scanner represents an investment in scientific discovery, collaboration, trainee development, and the future of precision mental health care.



Goal 2: Advance the evolution of The Royal into a rapid learning health system



Internal Culture

THE OPPORTUNITY FOR AI TO ACCELERATE DISCOVERY

The IMHR is generating more research data than ever before – from the Brain Imaging Centre’s multimodal scans to clinical outcomes captured through our growing research registry. This expanding data ecosystem presents a significant opportunity: with the right tools and safeguards, we could accelerate discovery and detection, and support more personalized treatment pathways. For boards of directors across health care, the registry raises questions about governance, ethics and privacy, and data security.

To explore the possible risks and opportunities for the IMHR, **Drs. Georg Northoff, Zachary Kaminsky, Christopher Sun, and Stuart Fogel**, along with **Owen Clarkin**, presented to the Board of Directors in October 2025. The session, titled “From If to What and How,” examined perspectives and potential of artificial intelligence in mental health research and care.

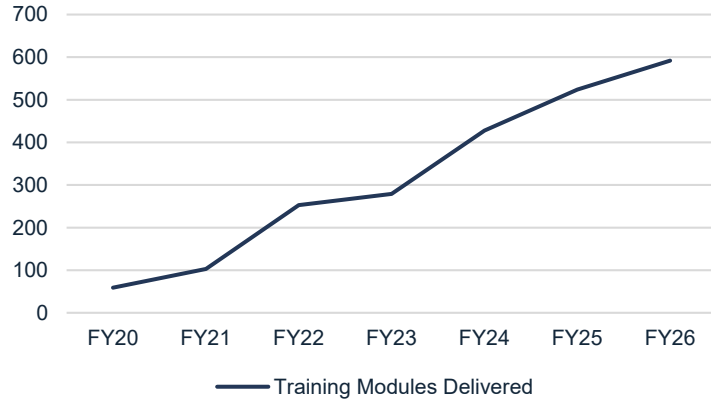
The opportunities are compelling: AI could support computational psychiatry using multimodal data from the Brain Imaging Centre; enable pilots on AI-assisted triage and risk monitoring; and accelerate research through integration of clinical, imaging, and behavioural data. But the risks require careful attention. AI models can amplify bias, and mental health presents particularly high stakes. Privacy, consent, Indigenous data sovereignty, and

environmental sustainability all featured in the discussion. In Canada’s current regulatory environment, where federal AI legislation remains unenacted, institutions must take the lead on governance.

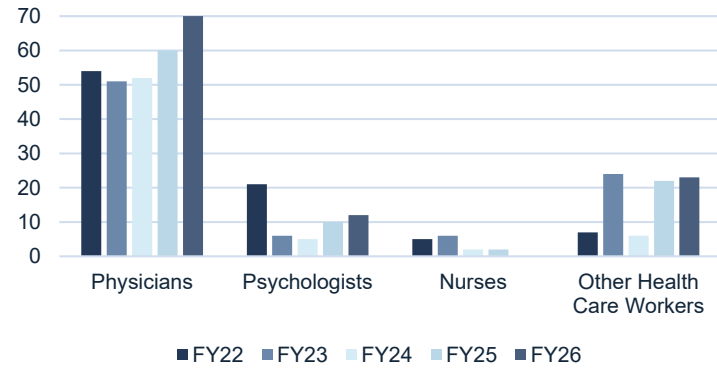
Following a recommendation made to the Board in that meeting, we are creating an Innovation Advisory Table. This group brings together experts from uOttawa, CAMH and with backgrounds in clinical AI, digital mental health, ethics, etc., to advise us on innovation opportunities and AI strategic and operational matters, co-design evaluation frameworks, and review high-risk proposals. The technology is moving fast, and we see lots of opportunity; nevertheless, we need to move thoughtfully but not slowly. The Innovation Advisory Table will help ensure we are positioned to lead through research rooted in care, ethics, and equity.

Goal 2: Advance the evolution of The Royal into a rapid learning health system

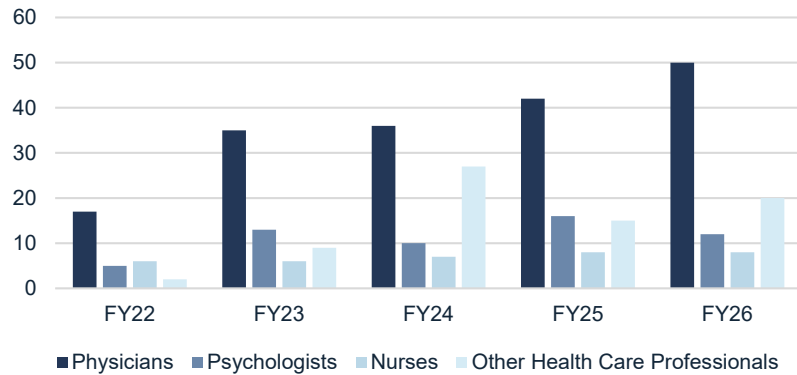
Research Competence & Regulatory Training



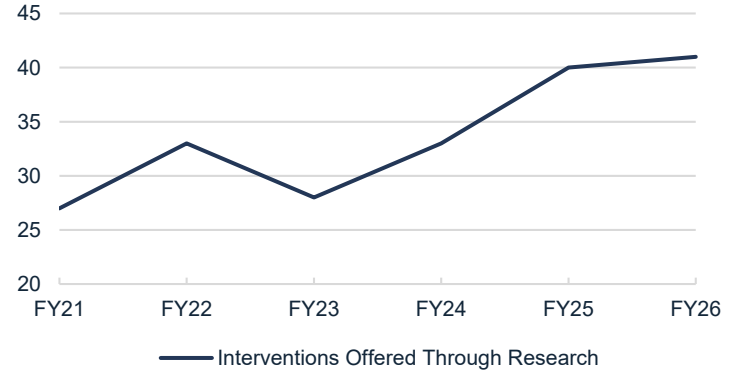
Clinicians as PI or Co-PI on REB-approved Studies



Interprofessional Collaborators



Access to Care Through Research



NEUME-TN CONFERENCE DRAWS 105+ TRAINEES ACROSS DISCIPLINES AND ORGANIZATIONS

In June we held the 2025 Neuroscience and Mental Health Trainee Network (NeuMe-TN) Conference, a cornerstone trainee development initiative, fostering interdisciplinary collaboration, knowledge translation, and leadership development across the neuroscience and mental health research community.

Entitled “Molecules to Minds: From Molecular Research to Precision Psychiatry,” the program highlighted the continuum from molecular discovery science to clinical innovation and precision psychiatry, reinforcing the importance of translational research across the mental health ecosystem. With 105 in-person attendees, plus virtual participants, the conference attracted trainees, researchers, physicians, clinical staff, community members, and family members, with the majority being students and early-career trainees.

Keynote speaker **Dr. Kathleen Pajer**, Chief of Psychiatry at CHEO and Director of the CHEO Precision Child and Youth Mental Health (PCYMH) Collaboratory, emphasized the transformative potential of precision psychiatry and the integration of molecular, clinical, and systems-level approaches to improve outcomes for children and youth.

The conference was co-chaired by **Jessica Drodge** (Interventional Psychiatry Research Coordinator, IMHR, The Royal) and **Zacharie Saint-Georges** (MD/ PhD Candidate, University of Ottawa).

The scientific program featured 5-minute thesis-style oral presentations by trainees, a poster session, interactive workshops, and a client and family panel – all reflecting NeuMe-TN’s commitment to research excellence, inclusivity, and community engagement.

Bridging the Gap: How Frontline Clinicians Are Bringing Research into Practice

Once a month, staff from across The Royal's Adult General Psychiatry program gather for snacks, conversation, and a shared question: what's new in mental health care, and how can we use it?

The Clinical Learning & Innovation Committee – CLIC – launched in May 2025 as a space for interdisciplinary learning. Co-chaired by social worker **Robin MacEwan** and recreation therapist **Rachel Blair**, and supported by **Dr. Zachary Kaminsky**, the initiative brings staff together to explore emerging practices and sharpen clinical skills.

“Best practice changes over time,” says MacEwan. “And staying current, especially on a busy inpatient unit, requires intentional work.”

The challenge is familiar across healthcare: staff attend trainings and develop expertise, but that knowledge often stays siloed. There's rarely a consistent space to share insights across disciplines or stay connected to developments in the broader field. CLIC was designed to change that.

“We wanted to cultivate a culture of curiosity,” says Blair. “A place where people can share knowledge and stay connected to what's happening in the field.”

Sessions have covered digital tools for psychosis care, the neuroscience of



emotional regulation, intimate partner violence screening, AI applications in clinical settings, and a live psychodynamic group therapy demonstration where CLIC members participated as the group.

“I learned so much about the importance of the invite,” MacEwan says of the group therapy session, “and that even when we think patients might not be well enough to participate, they can sometimes.”

Attendance has ranged from eight to twenty people per session, drawing from both inpatient and outpatient settings. Registered nurses sit alongside psychiatrists; MSW students learn with executive directors; occupational therapists exchange ideas with program evaluators. Cross-pollination is the point.

“We kind of liken it to a band,” MacEwan says. “You can have the best vocalist, the best guitarist, the best drummer in the world – and if you can’t play a song together, what are you?”

Patients on the Adult General Psychiatry unit – people living with bipolar disorder, treatment-resistant depression, schizophrenia, OCD – present with complex needs that don’t fit neatly into single-diagnosis studies. CLIC creates a channel for new evidence to reach the clinicians caring for them.

Blair sees the committee as a foundation for broader change: stronger communication across disciplines, better connections between inpatient and outpatient teams, and care informed by current evidence.

“We want the knowledge from group therapy to translate to the actual unit,” she says. “A nurse trying a breathing exercise. A colleague flagging a patient who’s ready to engage. It’s about opening those channels.”

MacEwan credits supportive managers and collaborators – including the IMHR’s Kaminsky – for helping CLIC gain traction. But the approach remains grassroots: identify what’s useful, invite the right people, and make space for learning.

ENHANCING ACCESS TO RESEARCH PARTICIPATION

Launched in April 2025, the [Research Recruitment Registry](#) creates a clear, consistent pathway for people to engage with mental health research – whether as a participant seeking access to cutting-edge studies, or as an advisor who brings lived experience to the work itself.

For those interested in participating in clinical research, the process is straightforward: registrants complete a brief questionnaire outlining their areas of interest or diagnosis – such as difficult-to-treat depression or schizophrenia – and a dedicated IMHR team member reviews their profile and identifies studies that may be a good fit. Registrants then choose the study that interests them before the research team assesses their eligibility. This approach puts choice in the hands of the individual, supporting their autonomy throughout.

The registry also opens a door for those who want to contribute to research in other ways. Advisors – people with lived experience who wish to be involved in committees, study development, grant adjudication, or document review – can register and be matched with researchers on an as-needed basis. This ensures that the client and family member perspectives are woven into how research is designed and conducted – not as an afterthought.

Since launching, 1,175 people have registered – 831 as potential participants, 82 as advisors, and 262 as both. The team has connected with 576 registrants and successfully matched 166 to a study. Of the 23 advisors contacted thus far, three have been matched with research teams. Registrants who have not yet been matched remain in the system and continue to be screened for new opportunities.

Informatics Capabilities & Capacities

RESEARCH DATA EMBEDDED IN ELECTRONIC HEALTH RECORDS

In 2025, The Royal joined the Epic Electronic Health Record system. Through this shared infrastructure, patients will have one record across all hospitals in

the network allowing clinicians to securely access health data across a patient's journey in our regional hospital system. Patients visiting providers in the network will be able to access their own health records through the MyChart patient portal.

As The Royal prepares to launch the system in October, the Research Institute has worked to ensure that research participation is included in the system. **Christine Waite, Tammy Beaudoin, Katie Dinelle and Owen Clarkin**, in collaboration with The Royal's Epic implementation team, have led the preparatory work to ensure the IMHR is ready to fully use the system to support research. For the first time at The Royal, select research information will be housed in the health record system. Improving access to high-quality, real-time clinical data and enhancing integration between clinical care and research activities, Epic will support more efficient participant identification and recruitment through standardized data capture and reporting tools. Overall, Epic will create a stronger digital foundation to support innovation, research growth, and improved patient outcomes.

ADVANCING SUICIDE PREVENTION THROUGH EHR-BASED PREDICTION

The importance and power of electronic health records is illustrated by the suicide prevention work of **Drs. Jennifer Phillips and Zachary Kaminsky**. Using data from all psychiatric inpatient admissions in Ontario between 2008 and 2020, the research team is exploring the ability of EHR data to predict risk of subsequent emergency department presentation for suicide attempt.

As the project has progressed, the analytic emphasis has shifted decisively from risk stratification toward clinical decision support. Specifically, the team refined an algorithm that identifies modifiable clinical choices during inpatient admission that may meaningfully reduce post-discharge risk. In The Royal's patient population, this tool now predicts hospital readmission with greater than 80 percent accuracy – a substantial improvement in performance and potential clinical utility. These findings have been submitted for publication.

In parallel, the team pursued implementation pathways, submitting evaluation grant applications with The Ottawa Hospital and initiating a collaboration with

CHEO to assess the tool's applicability in youth populations. Together, these efforts mark a transition from retrospective prediction toward prospective testing and clinical translation, with direct relevance for frontline providers and system-level planning.

A second EHR-focused initiative led by Kaminsky yielded the development of a predictor of clozapine response, capable of distinguishing patients likely to require antipsychotic polypharmacy versus clozapine monotherapy. This model achieved an area under the curve of approximately 75 percent, laying the groundwork for a future clinical decision-support tool that could reduce medication burden and improve treatment precision in treatment-resistant psychosis.

THE CARDIO-NEURO-MIND DATA PLATFORM

The links between brain and heart health are well-documented but under-researched – in part because the data infrastructure to study them at scale has never existed. The Cardio-Neuro-Mind Data Platform (CNMDP) was designed to change that.

Led by the IMHR in partnership with CAMH's Krembil Centre for Neuroinformatics and the University of Ottawa Heart Institute, the CNMDP brings together mental health, neurological, and cardiac research through [FAIR](#) data principles and open science. The team made significant progress this year in operationalizing its multi-modal research data platform designed to support integrated brain-heart research.

The platform currently hosts 21 actively contributing studies, including 4 Health Canada-regulated clinical trials, and has already generated data from 411 research participants – including more than 422 neuroimaging scans and more than 3,000 biospecimens.

In the next year, the Research Institute will require all new studies to use the platform, ensuring that data are centrally stored, discoverable, and available for future research. This shift strengthens research capacity at The Royal and positions the platform for institution-wide implementation.

The CNMDP represents a fundamental shift in how research is conducted

at The Royal: from individual studies with isolated datasets to a shared, cumulative infrastructure where data collected today continues to generate new knowledge for years to come.

CONTRIBUTING TO A NATIONAL HEALTH DATA INFRASTRUCTURE: ARCHIMEDES

The impact of the CNMDP will extend beyond The Royal. It also serves as a [mental health node within ARCHIMEDES](#) (Advanced Research Collaboration for Health Integration, Medical Exploration, and Data Synthesis), Canada's emerging national platform for health research data, bringing mental health datasets into a federated infrastructure alongside cardiovascular, neurological, and genomic data from institutions across the country.

ARCHIMEDES is funded through the \$109-million Brain-Heart Interconnectome program, supported by the Canada First Research Excellence Fund. Its goal is to become the backbone of Canada's health data ecosystem: a bilingual, federated platform where researchers across institutions and regions can discover, access, and analyze multi-modal health data without that data having to physically move to a central location.

In practice, this is significant: mental health data – historically siloed, underfunded, and underrepresented in large-scale research infrastructure – now has a formal seat at the table in Canada's emerging national data ecosystem. Researchers anywhere in the country who query ARCHIMEDES can access mental health datasets alongside cardiovascular, neurological, and genomic data, enabling the kind of cross-disciplinary questions previously impossible to ask at scale.

TRANSFORMING ACCESS: A NEW PARTNERSHIP WITH MOBIA HEALTH

For individuals waiting for mental health care, time is not abstract – it is weeks, months, and sometimes years of living without the support they need. The Royal's Adult General Psychiatry Program has wait times up to two years. Closing that gap is both a clinical and ethical imperative.

This year, The Royal partnered with Mobia Health Innovations, a Dartmouth,

N.S.-based company that partners with clients to develop clinical navigation tools. In collaboration with the Research Institute and research and clinical partners across The Royal, Mobia is developing a waitlist management system through its Access Navigator platform using the hospital's current data.

Applied to the Adult General Psychiatry Program, this work will bring much-needed structure and responsiveness to a waitlist that has grown beyond what manual processes can manage. The tool will use information from the referral to generate curated resources available through research or in the community that may support the patient while on the waitlist. The data it generates will inform how The Royal allocates resources and plans care over time – connecting directly to IMHR's vision of a rapid learning health system.

Learning Health System Impact

EXTENDING THE ROYAL'S LEARNING HEALTH SYSTEM VISION ACROSS OTTAWA

The Royal is laying the groundwork for the Ottawa Mental Health Council, an ambitious initiative that will position Ottawa as a national reference site for integrated, evidence-driven mental health research and care. The Royal has long been committed to becoming a learning health system – one where research and care exist in continuous dialogue – and the Ottawa Mental Health Council represents the extension of that vision across the broader Ottawa ecosystem. Ottawa faces a growing mental health and addiction burden driven by population growth, rising acuity, and deep system fragmentation – with persistent gaps in access, crisis care, and continuity that no single institution has been able to close. Anchored by The Royal and the University of Ottawa Faculty of Medicine, Faculty of Health Sciences and Faculty of Social Sciences, the Council will function as both a think tank and a system integrator. Most importantly, it will bring together healthcare providers, community organizations, Indigenous partners, researchers, and governments to address the fragmentation that has long limited the effectiveness of mental health systems.

The Ottawa Mental Health Council is being designed as a learning health

system for the region – one that improves access, strengthens continuity of care, and ensures that evidence reaches patients faster and more equitably. With a founding Executive Director expected to join in fall 2026, the initiative will move into active implementation, beginning with a comprehensive needs assessment and the establishment of a governance structure that reflects the full breadth of Ottawa's mental health ecosystem. This is an investment not only in better care for Ottawa, but in building the kind of infrastructure that can scale its lessons regionally and nationally.

CLOSING THE GAP BETWEEN DISCOVERY AND CARE: LAUNCHING THE ACADEMIC COMMITTEE

It is a surprise to many that studies have shown that research discoveries take an average of 17 years to reach patients as standard clinical care – a lag that represents both a waste of scarce resources and a sacrifice of patient benefit that could have been realized far sooner. Embedding research into care is one of the significant benefits of hospitals like The Royal. Our researchers provide care, but that doesn't ensure that their discoveries are widely offered to patients quickly. Translating evidence into practice requires deliberate structures, sustained effort, and governance that keeps research and care in active conversation with each other.

Closing the gap between research and care is an underlying principle of both the hospital's SPARQ Strategy and the IMHR's strategic research plan, ensuring that research informs continuous improvement and innovation in care. This year, we took a concrete governance step toward that goal with the creation of the Academic Committee.

The Committee is an interprofessional advisory body co-chaired by the IMHR's **Dr. Florence Dzierszinski** and **Dr. Benoit Mulsant**, Chief of Staff / Physician in Chief for The Royal. Its membership spans clinical leadership across psychiatry, psychology, nursing, social work, occupational therapy, and pharmacy; scientists and clinician-scientists; university partners; trainees; and patient and family advisors. It will promote research-informed practice and measurement-based care across all clinical programs, embed research and evaluation functions directly within clinical teams, and develop the Academic Framework

that will govern scholarly activity across disciplines.

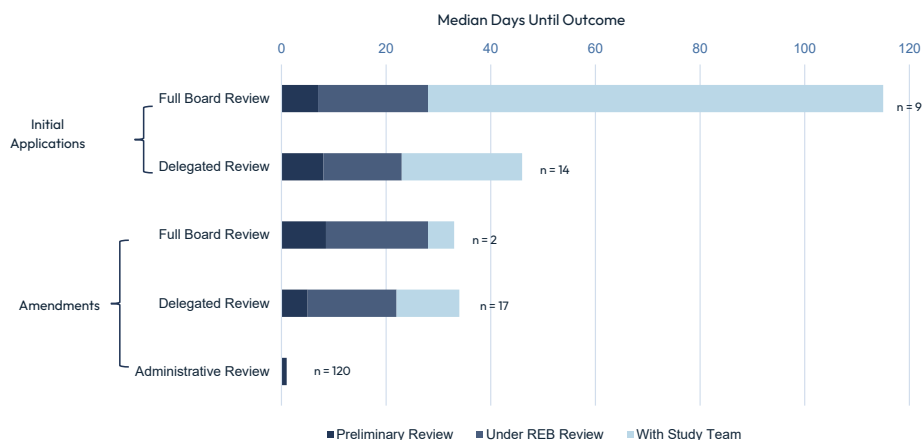
The Academic Committee will help us ensure the journey from discovery to patient benefit is as short as possible.

Governance & Oversight

RESEARCH ETHICS BOARD: HARMONIZATION FOR GREATER SPEED AND SAFETY

Our Research Ethics Board continued to meet or exceed benchmarks of comparable high-performing REB offices. This year’s focus was on laying the groundwork for regional, provincial, and national harmonization. This included work under the Ottawa Academic Health Network and participation in broader initiatives such as Clinical Trials Ontario to streamline reviews, reduce duplication, and maintain strong quality and oversight.

For researchers, this will mean clearer, more consistent processes and fewer redundant reviews; for patients and participants, it will mean safer, higher quality studies that can open more quickly and bring promising innovations to care faster, even as we retain the local REB expertise needed for complex mental health research.



SCIENTIFIC ADVISORY COUNCIL: AFFIRMING EXCELLENCE, SHAPING THE FUTURE

Our Scientific Advisory Council, under the leadership of Chair **Dr. Andrew Greenshaw** and Vice-Chair **Dr. Damian Jankowicz**, convened last summer to review IMHR’s progress and strategic direction. The Council brings together distinguished researchers from across Canada who provide independent guidance on our research priorities and growth. We are grateful for their candid assessment and constructive recommendations.

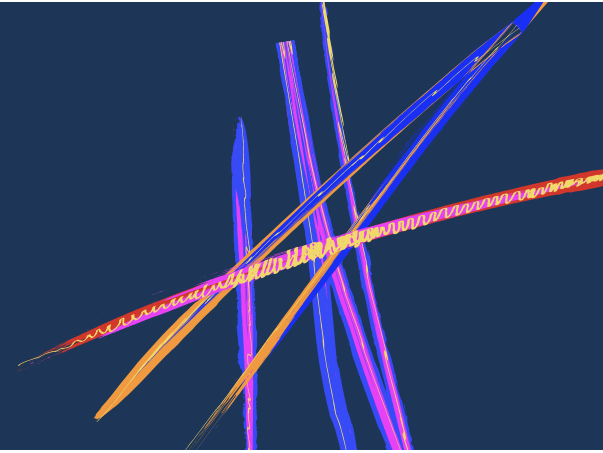
The Council affirmed the IMHR’s strong trajectory, noting our collaborative culture, operational progress, and readiness to expand strategic partnerships. They recognized the collegial environment we have built – one that blends senior expertise with emerging talent – and commended our work in clinician engagement, ethics reform, and patient and caregiver integration. This external validation is encouraging, but we were most interested in where the Council saw opportunities for improvement – recommendations that will shape our work in the year ahead.

The Council urged us to prioritize recruitment in addiction research and computational psychiatry – fields representing significant social need and scientific opportunity, with potential to intersect in areas like predictive analytics for substance misuse. They recommended enhancing our grant support infrastructure for large-scale funding applications and suggested how to encourage more internal competition and collaboration to strengthen proposals. On patient and caregiver engagement, the Council encouraged us to continue working to fully integrate lived experience into research planning and governance. They also recommended formalizing structured mentorship programs for early and mid-career scientists, noting that even collegial environments benefit from intentional structure – guidance that aligns well with our plans for the incoming Waverley House Accelerator cohort.

Finally, the Council advised developing a comprehensive business plan for the Brain Imaging Centre as it matures into a core facility, and continuing to build clinical trials infrastructure, particularly in addiction and digital health.

We take these constructive recommendations seriously and look forward to reporting on our progress at next year’s meeting.

Goal 3: Reduce the gap between discovery and impact for clients, patients, families, the community and society at large



Meaningful Client, Patient & Family Engagement

One of the least visible challenges in medical research is the question of priority. With more unanswered questions than there will ever be resources to pursue, researchers must constantly make choices about where to focus. Some of those choices are driven by funding landscapes, emerging methodologies, or gaps in the scientific literature. But some of the most important input comes from those living with mental illness and their families.

Most family members focus, understandably, on navigating the system to get the best care they can for the patient. Others are driven to go further, advocating for research into what still needs to be understood.

For example, one mother who has spent two decades searching for answers reached out to our researchers. Her son has a complex genetic syndrome that is still poorly understood and affects everything from the heart to the brain. During her family's journey, she arrived at a compelling question: if this condition carries the highest known genetic link to schizophrenia, why does only one in four people with it develop the illness – and what protects the other three? It's a question that might not have been considered by our team but is exactly the kind of question that can shape a study.

That mother wasn't the first to suggest we look into a new research path. **Cory Taylor**, a CAF veteran living with PTSD, was the catalyst as a patient for our work on Stellate Ganglion Block, worked on our clinical trial and has now been named to our Research Ethics Board.

Beyond proposing research paths, many clients and family members play an integrated role in our research. In the last year, we had 16 active studies with clients and families as collaborators or advisors in research, up from 12 the year before and six in FY22. The Research Recruitment Registry that launched in 2025 and the introduction of the Epic Electronic Health Records system will help us scale that involvement.

Research Capacity & Intensity

CLINICAL TRIALS: ADVANCING SCIENCE, EXPANDING ACCESS TO CARE

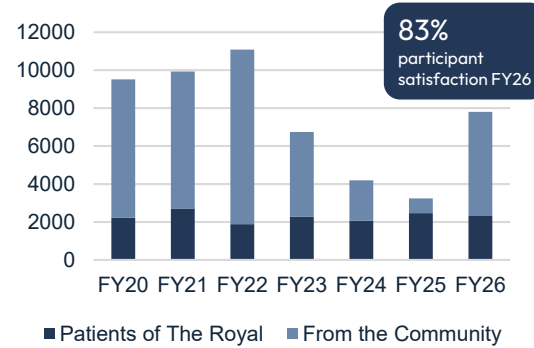
Clinical trials are structured research studies designed to evaluate the safety, efficacy, and outcomes of medical, behavioural, and technological interventions. Conducted under rigorous scientific and ethical standards, they generate the evidence needed to improve patient care, inform clinical practice, and in some instances guide health policy. At The Royal, they also offer cutting-edge, evidence-informed interventions to the people who need them most.

Goal 3: Reduce the gap between discovery and impact for clients, patients, families, the community and society at large

Access to Care Through Research
(Number of Patients)

	FY24	FY25	FY26
Neuromodulation	48	57	75
Depression	15	19	18
Cognitive Health		44	21
Sleep			129

Research Participants



Quality of Care Through Research

Improvement in Clinical Outcomes

Neuromodulation Research Clinic (Depression)

Clients Reaching Treatment Goal (39% Response 16% Remission) 54%

BMO Innovative Clinic for Depression

General Improvement 68%

Clinical Symptoms (both PHQ-9 & MADRS Scales) 53%

Improvement in Suicidal Ideation Severity (CSSRS) 82%

Cognitive Remediation Research Clinic (Schizophrenia)

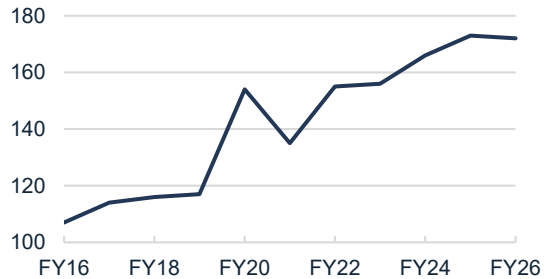
Cognitive Outcomes (CANTAB Scale) 100%

Clinical Sleep Research Unit

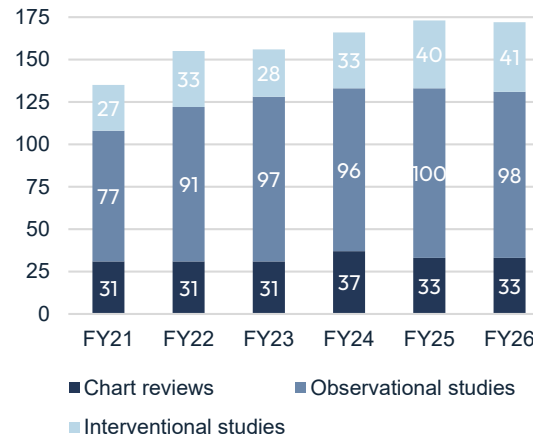
Clients Reaching Treatment Goal 69%

Improved Symptoms (Hamilton Rating Scale for Depression) 80%

Studies Approved By Research Ethics Board



REB-Approved Studies by Type



16 (12%)

active studies with patients and families as collaborators or advisors. Up from 11 (8%) in FY25

The Royal had 41 active clinical trials underway at year end, reflecting a robust and growing research portfolio. Six of these are drug trials evaluating investigational therapies or existing medications used in new ways to complement other treatment regimens. These trials provide treatment through research for some of the most serious and difficult-to-treat conditions in psychiatry, including PTSD, major depression, suicidal ideation, and Alzheimer's disease.

The remaining trials encompass a broad range of non-pharmacological interventions – among them tailored exercise, personalized (EEG-based) breathing, cognitive behavioural therapy, music, and device-based treatments – targeting conditions including schizophrenia, psychosis, depression, sleep disturbances, and anxiety. Many of these interventions would simply not be available to participants through standard care.

This is what makes clinical trials at The Royal so significant: they do not operate in isolation from patient care. For participants, enrollment in a trial can mean access to innovative treatments that are not yet widely available or government funded. For The Royal, each trial represents a commitment to narrowing the gap between scientific discovery and real-world impact – ensuring that our patients and the broader community benefit quickly from the latest advances in mental health research.

The Royal is part of the Canadian Biomarker Integration Network for Depression (CANBIND). **Dr. Pierre Blier** is the site investigator in Ottawa for CANBIND, which is running two clinical studies in nine cities across Canada. The first is the CANBIND-17, examining the effectiveness of starting two medications from treatment initiation (200 patients randomized), and the ENABLE registry of patients who have been diagnosed with a depressive episode in their lifetime (700 patients), both on a clinical and biomarker platform. The data is stored in a repository that can be accessed by research groups.

Beyond their direct impact on patient care, clinical trials also play an important role in sustaining and diversifying our research program. Active studies attract funding and partnerships from industry and academic collaborators – supporting the financial sustainability of the enterprise and creating conditions

for more ambitious research over time.

This year, the Research Institute partnered with **Dr. Tim Lau** to hire a Clinical Research Coordinator who will manage two trials in the geriatric population, both investigating novel treatments for Alzheimer's and dementia. The hire is a first step toward building a more permanent clinical trials unit at The Royal.

Looking ahead, The Royal is working toward the development of a dedicated, purpose-built research space, fully equipped and staffed to support complex trials in compliance with research regulations. This investment in infrastructure will strengthen our capacity to conduct a wider range of studies and deepen our role as a leading site for clinical trials research in mental health.

Advancing Personalized Care by Timing Your Thoughts

A breakthrough study on the speed or tempo of thought is paving the way for precision psychiatry at The Royal

When patients arrive at a cancer clinic or cardiology unit, they undergo a battery of diagnostic tests before ever seeing a physician. Blood work, imaging scans, and EKGs provide objective data that guide subsequent diagnosis and treatment decisions. In mental illness, that same diagnostic precision has remained elusive, but researchers at The Royal are changing that, bringing us ever closer to personalized treatment paths.

Dr. Georg Northoff, a neuroscientist and psychiatrist at The Royal and Professor of Psychiatry at the University of Ottawa, published groundbreaking research last year in the Proceedings of the National Academy of Sciences, a top journal in science. He and his team demonstrated for the first time that thoughts have measurable time scales, an intrinsic duration of lasting longer or shorter. This discovery provides insights into the nature of the hitherto invisible, just as the X-ray allows us to see and visualize our internal organs.

“For decades, we’ve been able to measure heartbeats, breathing, and brainwaves, but not mental features like thoughts,” says Northoff. “This study shows that thoughts have a measurable tempo. That opens a completely new window into how mental disorders work. Why? Because mental disorders like anxiety or depression often show abnormal speed of thought, either too

slow (‘my thoughts never change,’) or too fast (‘my thoughts are racing.’)”

Beyond Content – The Timescale of Thought

Traditional psychiatry has largely focused on the content of thoughts; that is, negative thoughts in depression, threatening thoughts in psychosis. But as Northoff explains, this content-based approach has limitations. “I can have negative thoughts not only in depression, but also in PTSD, in anxiety, and in schizophrenia. So maybe we are missing something.”

That something, his research reveals, is time. The same thought content takes on entirely different meaning depending on how it moves through the brain. In depression, thoughts become slow and stuck, like staring at a flat, waveless sea. Relaxing for five minutes, perhaps, but devastating over hours and days. In mania, thoughts race. In schizophrenia, their timing becomes imprecise, arriving a split second too early or too late, leading to the fragmented thinking characteristic of the condition.

Using EEG combined with simple tasks like finger-tapping, Northoff and his team can now measure these temporal differences in our thoughts with precision, distinguishing between conditions that present with similar symptoms but require different treatments, such as major depressive disorder and bipolar depression.

From Diagnosis to Treatment: A Vision for Precision Psychiatry

The clinical implications could be profound. Northoff has developed a four-stage diagnostic approach that begins with online psychological scales and tasks, progresses to EEG, and extending to advanced brain imaging (EEG and fMRI) when needed, all designed to be practical and accessible.

“Before a good therapy comes an even better diagnostic,” he said. His vision is to offer diagnostic testing to patients even while they’re on waiting lists, so that by the time they see a physician, there’s already objective data to formulate evidence-based treatment decisions.



Working in collaboration with the Brain Imaging Centre, Northoff developed a preliminary diagnostic algorithm to guide neuromodulation. While the protocol is yet to be peer-reviewed and was only applied to a single patient, results are intriguing. Northoff treated a patient who had suffered from severe, treatment-resistant depression for two years. Standard treatments, even ECT, had all failed. So too had advanced treatments used at the IMHR, like repetitive transcranial magnetic stimulation (rTMS) to the prefrontal cortex, the conventional target. Northoff used comprehensive diagnostic testing, including psychological assessments, brain imaging, and computational network modelling to determine that this patient needed stimulation to the visual cortex instead of the prefrontal cortex, with a specific frequency combination. After years of unrelenting depression and anxiety, the patient's symptoms dropped dramatically within a week and remained improved over time. A causal effect between treatment and clinical outcomes is yet to be established, but this patient hasn't felt better in years.

Building the Future of Mental Health Care

Northoff's spatial-temporal approach offers a blueprint for modernizing mental health care. By making the invisible visible, his work creates the possibility for truly personalized treatment, where interventions like rTMS could be tailored to each patient's unique brain dynamics rather than applied in a one-size-fits-all manner. For patients at The Royal and beyond, this work holds the promise of faster, more accurate diagnoses and treatments matched to their individual needs, moving mental health care from trial and error toward the precision medicine that patients deserve.

“Progress in medicine always came through visualization,” Northoff said. “With the advent of the X-ray, you could suddenly see the lung. With an ultrasound, you could suddenly see the heart moving. That's what we have needed in psychiatry. That's what I'm trying to develop.”

Next, Northoff needs the opportunity to test diagnostic tools at scale, including funding and peer-reviews, to move from a single success story to broader evidence that could change clinical practice. Northoff notes that traditional research grants often are unavailable to explore approaches this new. He will next work with patients who have not responded to ECT – or rTMS. One day soon he hopes to work with patients on The Royal's waiting list to help some get treatment sooner, and partner with The Royal's new Urgent Care Clinic. In this way, this collaboration allows for Northoff's discovery to be both rigorously tested at scale and translated into care sooner – because Research is Care.

Dr. Georg Northoff is a Professor of Psychiatry at the University of Ottawa and a senior scientist at The Royal. He is a Fellow of the Royal Society of Canada, and the Canada Research Chair for Mind, Brain Imaging and Neuroethics.

www.georgnorthoff.com

Client, Family & Community Impact

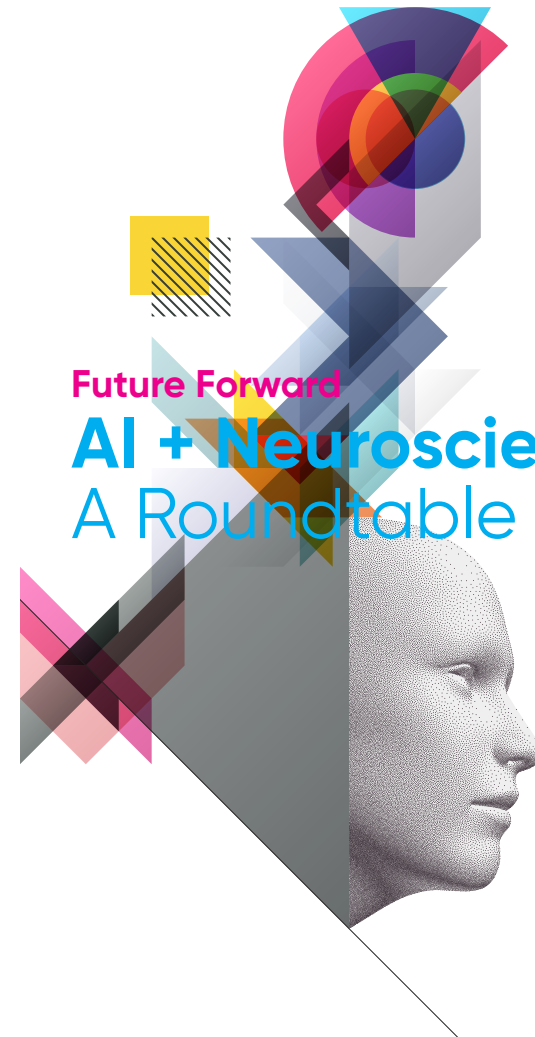
CONTRIBUTING TO CANADA'S VISION FOR AI AND BRAIN RESEARCH

When Brain Canada set out to shape a national strategy at the intersection of artificial intelligence and neuroscience, it turned to the research community it had spent years building – and from the beginning, The Royal was part of that conversation. In June 2025, The Royal hosted one of eight roundtable discussions Brain Canada convened across the country, gathering leading experts in AI and brain research to help define the field's priorities, challenges, and opportunities.

Those consultations culminated on Parliament Hill. In November, **Katie Dinelle**, and **Drs. Jennifer Phillips, Georg Northoff and Reggie Taylor** represented The Royal at Future Forward: AI + Neuroscience, a Parliamentary Briefing where Brain Canada presented its findings directly to federal legislators. The following day, Brain Canada published its [pan-Canadian consultation report](#), reflecting the collective input of roundtable participants and framing the current moment as a defining opportunity for Canada.

The report makes a forceful case. Canada ranks among the top five countries in brain research and first in the G7 for year-over-year growth in AI talent density. To build on those strengths, Brain Canada called for an immediate federal investment of \$38.9 million over five years across four priorities: building AI-ready national data infrastructure; funding transdisciplinary research from discovery to implementation; creating 30 to 40 AI-neuroscience fellowships; and recruiting early-career scientists, with particular attention to talent leaving the United States amid funding cuts there.

The Royal's participation reflects a broader institutional commitment: to contribute not only to the science, but also to the national conversations that determine where it goes.

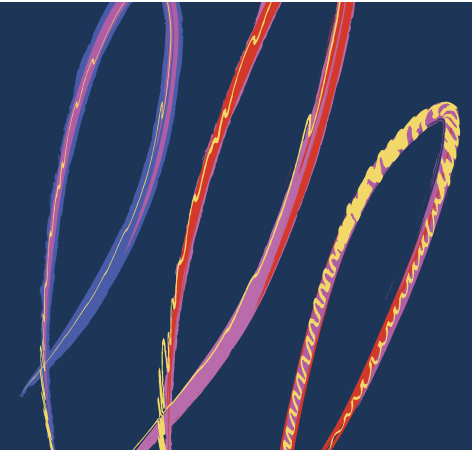


Future Forward AI + Neuroscience A Roundtable series

A Summary of Discussions
Prepared by: Brain Canada Foundation
Spring 2025

“Artificial intelligence (AI) is revolutionizing the way neuroscience research is conducted and, in the process, boosting the promise for earlier detection, improved prevention strategies, and better treatments for everything from autism and depression to Alzheimer's disease.” – Dr. Viviane Poupon, CEO, Brain Canada

Goal 4: Become a globally renowned academic health science centre for mental health research and innovation to amplify research impact



Partnerships with Community Organizations

RESEARCH WITH, NOT ABOUT: PUTTING YOUTH AT THE CENTRE OF ONLINE SAFETY

Meaningful research partnerships don't treat community organizations as passive recipients of findings – they bring them in as co-investigators from the start. That principle is at the heart of a new five-year, \$1.5 million CIHR-funded project led by **Dr. Tanya Halsall**, in collaboration with youth leads and the Students Commission of Canada. The project – There can be no free speech without free will: Mobilizing youth voice to counter commercial technology oppression – will examine online harms affecting children and youth aged 8 to 25, including addiction, negative body image, sexual exploitation, self-harm, and suicide. The research takes a systems-level view. Rather than focusing on individual behaviour change, it asks how the policies and business practices of commercial technology companies contribute to harmful online environments and what can be done about it.

Young people are not simply the subjects of the research – they are investigators, with **Oleksandr Makeikin** named as a Youth Investigator on the team. The Students Commission of Canada is a national organization with over three decades of experience turning youth voice into policy change, and

its own research and evaluation infrastructure to do so. Together the research team will explore lived experiences in digital spaces, analyze tech industry practices and policy, and co-create actionable recommendations for safer online environments. The outcome is research designed not just to describe a problem that young people experience, but to produce solutions shaped by the people most affected – a tangible demonstration of what genuine community partnership in research can look like.

Listen to Halsall and Makeikin talk about their research in this [CBC Ottawa Morning interview](#).

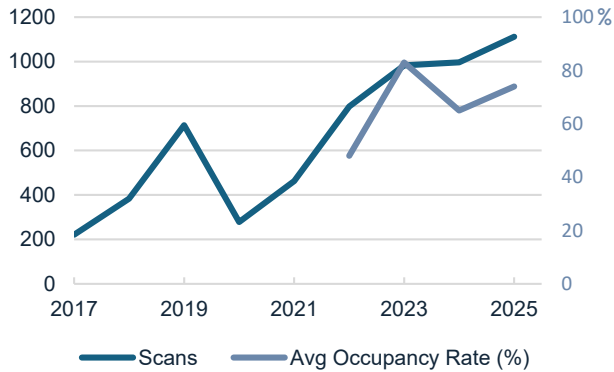
WABANO – PARTNERING TO RESEARCH IMPACT OF FIRST NATIONS DRUMMING

While most of our research takes place physically at The Royal, we relish the opportunity to work in the community alongside partners like the Wabano Centre for Aboriginal Health here in Ottawa – particularly when the research topic is requested by the community itself.

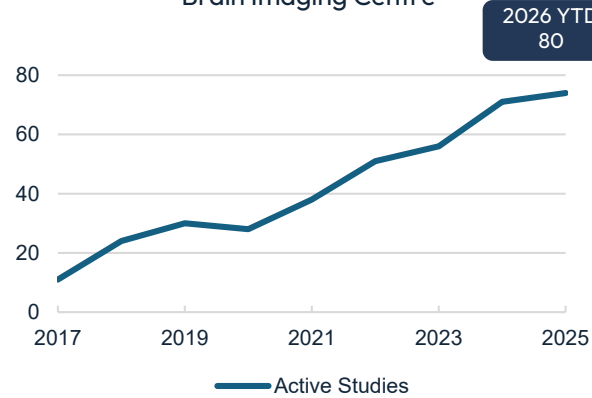
Together with Wabano, we have been working to document and measure the impact of First Nations drumming on mental health. We have long understood the personal impact that music can have on our mental health, but the science has been lacking on the why and how. Specifically, little to no research has been done on the impact of Indigenous drumming in Canada. Working with Wabano

Goal 4: Become a globally renowned academic health science centre for mental health research and innovation to amplify research impact

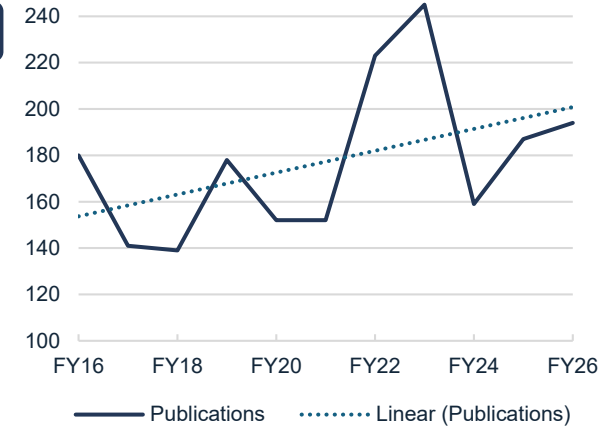
Scanning Activity at Brain Imaging Centre



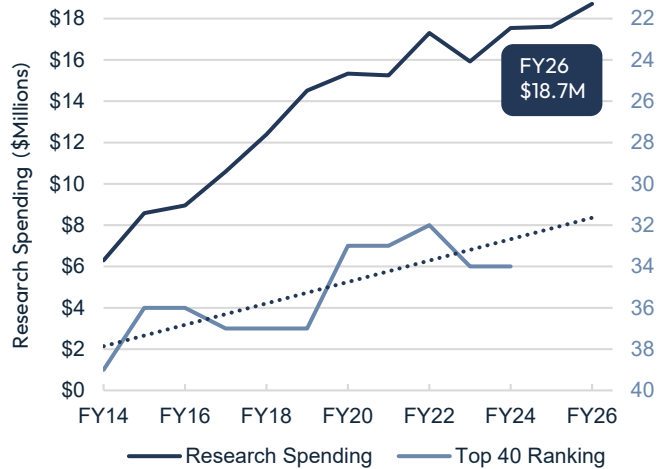
Active Studies at Brain Imaging Centre



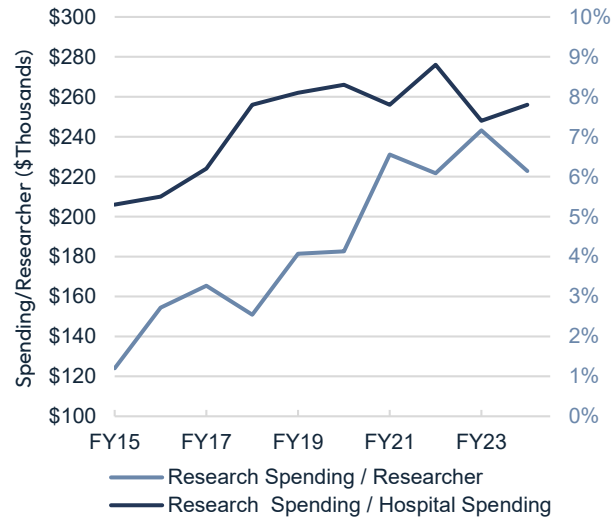
Peer-Reviewed Publications



Annual Research Spending



Research Intensity



34

media articles & interviews featuring IMHR research

Innovation Milestones at the IMHR

Commercializations	1
Licences	4
Spin-off Companies	2
Disclosures	3
Patents Submitted	2
Patents Awarded	2

CEO Allison Fisher, IMHR researchers **Dr. Gilles Comeau, Beverley McKiver, Hervé Guy, and Aleksandra Olejar**, are working to understand the science behind drumming as a tool for healing.

Drumming is a source of healing, identity, and belonging in Indigenous communities. Together, IMHR and Indigenous researchers with lived experience and academic expertise are working together to better understand drumming's power.

Research is actively underway with members of the Men's Drumming Circle, whose members' experiences and voices are at the heart of the project. Significant themes have emerged, such as loss and recovery of identity, the drum as a source of healing and belonging, rediscovering and reclaiming culture, and the universal power of music.

Two papers have resulted from the collaboration to date: a systematic review on Indigenous drumming has been submitted for publication, and a literature review connecting drumming to brain imaging research is in preparation, both with meaningful Indigenous authorship.

Conversations are underway on how we may extend our partnership, even as ties between our teams organically extend into other areas of research.



Leading from Behind

What does it take for marginalized communities to create the conditions in which their own members – especially youth – can truly flourish? And what is the role of the researcher in making that happen without taking over?

Dr. Kim Matheson is the Culture and Gender Mental Health Research Chair jointly held at The Royal and the Department of Neuroscience at Carleton University – a position she has held since

2017 and concluding in 2026. Matheson's work bridges disciplines – psychology, engineering, organizational management, communications, and program evaluation. This approach took root in the 1980s through research on the social implications of what was then called 'computer-mediated communications' and 'office automation.' The applied relevance of her research has been evident throughout her career.



Matheson's research has focused on how to bring about individual and collective wellness and resilience among members of groups facing systemic and pervasive discrimination. Her research looks at how group members cope with discrimination, and the implications of the strategies they adopt for social change. At the same time, she is assessing how to be an effective and supportive ally without appropriating the leadership role or underestimating group strengths.

Together with her students and collaborators, she has conducted research with numerous vulnerable minority groups in Canada (Somali refugees; religious minorities), individuals who have experienced stigma associated with mental

illness (depression; post-traumatic stress disorder; eating disorders; gambling addiction) or physical illness (Fibromyalgia; breast cancer survivors), and young people, particularly women, who have experienced childhood trauma, many of whom continue to be involved in abusive intimate relationships.

More recently, this work has expanded globally: Matheson oversaw a comprehensive review of the psychosocial and neurobiological determinants of mental and physical health among refugees and immigrants worldwide, with implications for prevention and policy.

Of particular significance is her work with First Nations communities, specifically concerning the transgenerational effects of the Indian Residential Schools on the well-being of the offspring of survivors, and the protective role of cultural identity. Since 2015, she has been leading an SSHRC Partnership Grant called Indigenous Youth Futures, which is designed to support First Nations communities in Northwestern Ontario in creating the conditions for their youth to flourish. At its core, this project is led by community members and youth themselves.

To Matheson, the most significant impact of this work has been the active empowerment of young people to bring about the changes they envision. With support from the IMHR and SSHRC, she has encouraged several teams of First Nations youth (in partnership with university students) to take a leadership role in developing and implementing cultural-based strategies that promote youth wellness. This has included creating a not-for-profit organization to lend regalia to participate in community pow-wows; organizing and running a workshop to encourage youth to express themselves through their artwork; and developing resources and supports to promote confidence among First Nations youth transitioning out of the child welfare system. Matheson views these youth-led projects as the most important metric of the success of the work she and her students and colleagues have been dedicated to for the past decade.

Dr. Kim Matheson is joint Research Chair in Culture & Gender Mental Health at The Royal & Carleton University.

Multi-Institutional & Multi-Sectoral Partnerships

OTTAWA ACADEMIC HEALTH NETWORK: COLLABORATION IN ACTION

When the Ottawa Academic Health Network (OAHN) was formed in September 2023 it brought together uOttawa and all its affiliated teaching hospitals and research institutes. The network represented a formal commitment to something The Royal has long believed: that collaboration makes us stronger, smarter, and more innovative. **Dr. Julie St-Pierre** (VP Research and Innovation, uOttawa) and **Dr. Florence Dzierszinski** co-chair the OAHN Research and Innovation committee. This year, we have turned that commitment into practice.

Much of the OAHN's work over fiscal year 2026 has focused on dismantling the practical barriers that make multi-site research harder than it needs to be. Working groups have been addressing everything from research ethics approvals to core facilities access across the network. We have made concrete progress: all member research institutes now use the Clinical Trials Ontario platform for multi-site ethics approvals; the facilities and scientific platforms available across the network have been mapped and made visible to all members; and frameworks for joint appointments are under development to make cross-institutional collaboration structurally easier. IT directors across the hospitals and institutes are also working toward a system that would let researchers use a single set of hospital credentials to access university systems, with a target of next fall.

The practical ambition behind this work is significant. Ottawa has remarkable research strengths that are not always visible or easy to leverage. Operating as a network rather than in silos positions us to compete for larger collaborative grants, attract researchers who are drawn to the breadth of what is possible here, and ultimately do work that no single institution could accomplish alone.

A tangible sign of that momentum: uOttawa has recently announced a new cohort of University Research Chairs created specifically in partnership with

OAHN member institutes, and The Royal is a part of that cohort. **Dr. Rébecca Robillard**, Associate Professor in the School of Psychology at uOttawa and head scientist of our Clinical Sleep Research Unit, has been appointed as an OAHN-University Research Chair in Sleep and Mental Health. Robillard's appointment is a direct product of the OAHN model: a chair created through the partnership, hosted at The Royal's research institute, and oriented toward research that benefits from the network's collective clinical depth and data infrastructure. It is precisely the kind of outcome the network was designed to make possible.

A \$5.5 MILLION MANDATE: MUSIC, COMMUNITY, AND THE SCIENCE OF WELLBEING

Dr. Gilles Comeau and his team have secured a major federal investment in the science of music and mental health. Adding to a \$3M project supported by the Public Health Agency of Canada (PHAC), a successful application to the Social Sciences and Humanities Research Council (SSHRC) has resulted in \$2.5 million in funding over seven years for a study titled "Improving Wellbeing of Older Adults Through a Community-Based Music-Movement Program" – one of the most significant research grants in the clinic's history, and a powerful validation of the work that has been building here for years.

The project will examine how community-based music and movement programs can support the mental health and wellbeing of older adults; it embeds interventions in community settings and engaging people with lived experience as full research partners. It brings together an expanded network of collaborators from across the country, including researchers from The Royal, the University of Ottawa, and Bruyère Health, alongside robust partnerships with organizations across the region, including the Canadian Mental Health Association (Ottawa Branch), nationally and internationally.

The project's strength comes in part thanks to a parallel effort led by Comeau and **Dr. Patrick McGrath**, who were also leading a team in developing a proposal for the federal New Frontiers in Research Fund (NFRF). This application focused on harnessing music to transform mental health care for vulnerable and marginalized populations; although that application did

not result in funding, the process proved remarkably productive. It forged new research collaborations, deepened the team's thinking on community engagement and measurement, and introduced frameworks that have since been woven into the SSHRC project, making it considerably stronger than it might otherwise have been.

Among the most significant of those contributions was exposure to the Recovery College model – an approach to involving people with lived and living experience developed at CMHA. The model has now been integrated into the SSHRC project and is being rolled out across Ottawa research sites. It will be presented at the May 2026 Study Days event before being adopted nationally and internationally. A suite of biological and behavioural measurement tools developed during the NFRF process (including portable EEG systems, accelerometers, hair sampling for stress markers, and balance and movement assessment tools) are also now actively in use within the project.

Two videos produced during this period capture the spirit of the work and the partnerships it has generated: one on the experience of pursuing large research grants, and another on the partnership between CMHA and The Royal and the Recovery College approach. Together with the SSHRC award, they mark a turning point for a research program that is growing in scale, depth, and ambition.

Industry & Innovation Partnerships

TOWARD THE FIRST BLOOD TEST FOR A MENTAL ILLNESS

For decades, psychiatric diagnosis has relied almost entirely on what patients can describe about their own experience. **Dr. Zachary Kaminsky** is working to change that. This year, in collaboration with Dionysus Health – a company he co-founded to bridge epigenetic research and clinical practice – Kaminsky invested substantial effort in re-engineering the algorithm at the heart of an epigenetic blood test for postpartum depression, the first of its kind to move toward routine clinical deployment.

Earlier iterations of the test worked by detecting distinctive methylation

patterns on two estrogen-sensitive genes in a pregnant woman's blood, patterns that emerge across all three trimesters and that predict postpartum depression with more than 80 percent accuracy. The refined algorithm integrates epigenetic variation across many more genes covering additional postpartum depression relevant biology and is designed to perform reliably across diverse datasets and real-world clinical settings – a critical step between laboratory promise and practical use. That engineering work proved doubly valuable: methodological advances developed for the postpartum depression test were directly applied to a parallel project, a relapse predictor for postpartum psychosis, accelerating progress on both fronts simultaneously.

The cross-pollination between IMHR's academic research and its commercial translation is itself a model – demonstrating how a single breakthrough in biological understanding can generate multiple clinical tools with the potential to transform care for women at a vulnerable moment in their lives.

STELLATE GANGLION BLOCK FOR PTSD: FROM PILOT TO RESEARCH CLINIC

Stellate Ganglion Block (SGB) is a minimally invasive procedure in which a local anesthetic is injected into a nerve cluster at the base of the neck – the same cluster connected to the body's fight-flight-or-freeze response. [Cory Taylor](#), a CAF veteran living with PTSD, heard about the innovative treatment and brought it to the attention of his psychiatrist at The Royal. That conversation set something in motion. Rather than dismissing an unfamiliar approach, his psychiatrist, **Dr. Rebecca Gomez**, investigated, connected with a physician at The Ottawa Hospital already experienced in SGB, and began building the evidence needed to bring the treatment home.



SGB is now approved for offer at The Royal as part of a research clinic within Interventional Psychiatry – a testament to what is possible when clients are treated as partners in shaping their own care.

When Gomez first looked into SGB as a PTSD treatment, there was scant evidence, with no Canadian research at all. Determined to change that, and in order to provide access to the procedure, she and her colleagues designed an IMHR-supported pilot study. Their initial case series involving 26 Canadian Armed Forces (CAF) veterans and RCMP members was conducted between 2020 and 2022, and found statistically significant reductions in symptom distress, PTSD severity, and depressive symptoms following SGB, with no significant adverse events. That foundational work set the stage for the much larger randomized clinical trial.

Between 2024 and 2026, Gomez and **Dr. Jakov Shlik** (co-Principal Investigators) and a research team (including Gomez's patient, Taylor) conducted a Phase III Randomized Controlled Trial enrolling 65 participants, including CAF veterans, RCMP, and members of the Canadian Special Operations Forces (CANSOF). Supported by funding from a Translating Research into Care Grant, the University Medical Research Fund, and the Department of National Defence – totalling close to \$170,000 – the trial compared the effects of a single SGB treatment against two repeated treatments, incorporating advanced neuroimaging and pupillometry to explore the biological mechanisms underlying treatment response. Preliminary analysis shows significant improvement in PTSD severity from baseline, with the most pronounced changes seen in those who received two treatments.

The team's next chapter is already underway. An Innovation Fund Provincial Oversight Committee grant worth \$290,000 over two years will fund a double-blind RCT comparing two formulations of the SGB injection: bupivacaine alone versus bupivacaine combined with ketamine. The trial will move the science toward precise, evidence-based protocols.

From a single conversation between a client and his psychiatrist, SGB has grown into a full research program.

Recognition

THE ROYAL RANKS AGAIN AS A TOP 40 RESEARCH HOSPITAL

The Royal has once again been named one of Canada's Top 40 Research Hospitals for 2025. The data is for the fiscal year 2024 – there is a lag of roughly 18 months between the reporting period and the announcement. Our ranking was unchanged at 34th, despite a 13 per cent increase in research expenditures, to \$17.6 million from \$15.6 million the prior year. The unchanged ranking is due to the overall growth of other hospitals, especially acute and non-specialized, also included in the ranking. That said, this 13% growth is very significant – one of the largest among Top 40 Research Hospitals, due to the implementation of new institutional infrastructure supported by the Canada Foundation for Innovation (CFI), including our new data platform.

As a leading indicator, our target remains a top 20 ranking by 2034, which in the most recent year required spending of \$49.6 million, achieved by St. Joseph's Health Care in London. It continues to be an ambitious target, but the momentum of our work continues to buoy us.

RESEARCHERS ATTAINING PUBLICATION SUCCESS

Researchers at the Royal's Research Institute published a total of 194 articles in the last year, up from 187 a year earlier, and almost 28% since FY21. Below is a sampling of papers, demonstrating innovative thinking across our research teams.

Structural and functional neuroimaging correlates of suicidal ideation in treatment-resistant major depressive disorder.

International Journal of Neuropsychopharmacology. 2026, 29(5), pyag016.
Burhunduli P, Vandeloo KL, Fang Z, Blier P, Phillips JL.

One of the questions at the heart of our work on suicide is why some people with depression develop suicidal ideation while others don't – and we're starting to be able to actually see why. In a study published in the International Journal of Neuropsychopharmacology, **Dr. Patricia Burhunduli**, under the leadership of **Drs. Jennifer Phillips** and **Pierre Blier**, used structural and functional neuroimaging to investigate the brain-based correlates of suicidal ideation in people living with treatment-resistant major depressive disorder (TR-MDD).

Analyzing MRI data from 41 participants, the team found that suicidal ideation was more severe in those with reduced thickness in the right lateral occipital cortex, and was associated with weaker functional connectivity between the right posterior parietal cortex and several other brain regions – including the anterior insula and areas of the temporal and frontal cortex. Critically, these associations held even after accounting for overall depression severity, suggesting that suicidal ideation has a distinct neurobiological signature beyond depression alone. The findings point toward specific brain targets that could one day inform more precise suicide risk assessment in this high-risk population.

Examining alterations in subjective sleep ratings in individuals with major depressive disorder receiving daily theta burst stimulation.

Journal of Affective Disorders Reports. 2025, 21,100933.
Cuda J, Smith D, Chaves AR, Fonseca KL, Drodge J, Shim S, Nasr Y, El-Outa M, Brender R, Antochi S, McMurray L, Robillard R, Tremblay, S.

Drs. Sara Tremblay and **Arthur Chaves** continued to advance our

understanding of rTMS treatment. In a Journal of Affective Disorders Reports article, they add important nuance to what we know about how theta burst stimulation (TBS) works. The study followed 66 individuals with treatment-resistant depression through four to six weeks of daily TBS – an optimized form of repetitive transcranial magnetic stimulation – to examine whether the treatment also affects sleep, a domain frequently disrupted in depression and known to influence treatment outcomes.

The results showed that TBS significantly improved both depression symptoms and several dimensions of subjective sleep quality. But the more telling finding was in the details: improvements in depression aligned more closely with changes in daytime functioning after waking, than with sleep quality itself. That suggests that TBS may be influencing the restorative, functional dimension of sleep rather than sleep architecture per se, opening new questions about the mechanisms underlying its antidepressant effects.

Distinct timescales dissociate spontaneous thought dimensions.

Proc Natl Acad Sci U S A. 2025, 122(38), e2427088122.
Hua J, Ge X, Dou M, Zhang Y, Ge L, Fogel S, Zhang J, Northoff, G.

Few researchers have pushed as far into the neuroscience of consciousness and spontaneous thought as **Dr. Georg Northoff**, and a new study co-authored by Northoff and **Dr. Stuart Fogel** – working alongside an international team and published in the Proceedings of the National Academy of Sciences, one of the world's most prestigious scientific journals – reflects the depth of that work. The study took on a deceptively simple question: when our minds wander, are all forms of mind-wandering the same? The work distinguished between two dimensions of spontaneous thought – whether thinking is on- or off-task, and whether it is oriented toward internal experience or the external world – and asked whether these dimensions have distinct neural signatures.

Using both behavioural measures and EEG data across two independent datasets, the team found a clear double dissociation: task-relatedness was linked to short neural timescales, while thought orientation was linked to long ones. In other words, different dimensions of our inner mental life unfold at genuinely different speeds in the brain, a distinction detectable at both the

level of behaviour and in neural activity. The findings, grounded in phase-based neural dynamics, offer a more precise framework for understanding how the brain organizes spontaneous thought – with potential implications for conditions where that organization breaks down.

Exploring the dissociative subtype of PTSD: The role of early-life trauma, cortisol, and inflammatory profiles.

Psychoneuroendocrinology. 2025, 175, 107406.

Jarkas DA, Robillard R, Malenfant CR, Richards C, Lanthier M, Beaurepaire C, Nicholson AA, Jaworska N, Cassidy CM, Shlik J, Kaminsky Z, McQuaid RJ.

In 2020–22, we created an interdisciplinary team to objectively define subtypes of PTSD using an AI-driven multimodal approach (Multi-dimensional Assessment of PTSD Subtypes – MAPS). With a \$1.25 million contract from the Department of National Defence through its Innovation for Defence Excellence and Security (IDEaS) program, the team produced an algorithm that effectively predicts the dissociative type of PTSD, a presentation characterized by emotional detachment and depersonalization. That initiative continues to bear fruit. In this latest paper in Psychoneuroendocrinology, the IMHR team that includes **Drs. Robyn McQuaid, Zachary Kaminsky, and Rébecca Robillard** asked whether dissociative PTSD is biologically distinct from non-dissociative PTSD, particularly in Canadian Armed Forces members and Veterans with a history of deployment.

The findings suggest that it is. Individuals with dissociative PTSD reported greater childhood trauma and more severe depression and PTSD symptoms than their non-dissociative counterparts. On the biological side, evening cortisol was elevated specifically in the dissociative group compared to the non-dissociative group – a distinction that held even after accounting for depression severity. The relationship between morning cortisol and PTSD symptom severity also differed by subtype, and inflammatory markers showed a unique pattern in dissociative PTSD alone. Together, the results make a case for treating dissociative PTSD not merely as a variant of the condition, but as a presentation with its own biological profile – one that may ultimately require its own treatment approach.

Cognitive Remediation for Psychosis in Virtual Reality (ThinkTactic VR): Qualitative, Iterative, and User-Centered Codevelopment Study.

JMIR Mental Health. 2025, 12:e69359.

Yee J, Matheson H, Bogie BJM, Du Perron É, Thérond A, Charest M, van Driel C, Goyette M, Lei YT, Noël C, Ariaratnam K, Collins G, Gorman C, Cretu AM, Tremblay S, Rivard MC, Cullwick C, Morris C, Attwood DG, Baines A, Stewart A, Bouchard S, Bowie CR, Guimond S.

ThinkTactic VR – a cognitive remediation program delivered inside a virtual reality environment for people living with psychotic disorders – is the subject of a new paper in the Journal of Medical Internet Research – Mental Health, led by **Dr. Synthia Guimond's** lab. The paper documents how the program was co-developed not just by a large interdisciplinary research team, but alongside the people it is designed to serve. Individuals with lived experience of a psychosis-spectrum condition met nine times over the course of development; healthcare professionals met separately, three times, to contribute a clinical lens.

What emerged from those sessions were distinct but complementary sets of needs. People with lived experience emphasized the importance of addressing cognitive challenges, leveraging technology meaningfully, and improving community functioning. Healthcare professionals focused on closing the gap between research and clinical practice, improving patient engagement, and working within the realities of limited resources. ThinkTactic VR was shaped by both – including the integration of a virtual coach inside the immersive environment, a direct response to participant feedback. To the team's knowledge, it is among the first cognitive remediation programs in VR to be co-designed using this kind of iterative, user-centered process.

Exploring Youth Substance Use Challenges and Solutions: Initial Developments in Participatory Research Focused on the Icelandic Prevention Model.

International Journal of Qualitative Methods. 2025, 24, 16.

Halsall T, Dixon M, Shams R, Khanna N, Jan M, Tayal J, Matheson K.

Drs. Tanya Halsall and Kim Matheson are advancing a distinctive approach to youth substance use prevention – one that puts young people at the centre of both the research design and the solutions. Published in the International

Journal of Qualitative Methods, their paper examines the early implementation of the Icelandic Prevention Model (IPM) in Lanark County, Ontario, the first community in Canada to adopt the approach. Rather than studying youth from the outside, the team co-designed the evaluation with young people themselves, integrating youth advisors, collaborative asset mapping, and community consultations into the research process.

What young people said mattered. Through interviews and focus groups, four clear themes emerged: social norms and the accessibility of substances as drivers of use; a lack of activities and spaces for young people; intersectional discrimination as a compounding factor; and concrete suggestions from youth themselves for strengthening their communities. The findings offer both a window into the specific challenges facing Lanark County youth and a model for how participatory research can meaningfully incorporate young voices into complex, community-level prevention initiatives.

Personality Disorders, Violence and Antisocial Behaviour: Updated Systematic Review and Meta-regression Analysis: Commentary.

The British Journal of Psychiatry 2025, 227, 1, 503 – 504.
Seto, M.

Dr. Michael Seto published a commentary in the British Journal of Psychiatry responding to a systematic review on personality disorders and violence, offering critical analysis of how antisocial behaviour is embedded within the diagnostic criteria themselves – raising important questions about what the research is actually measuring and what can genuinely be attributed to personality disorder versus prior criminal history. He also observed that most studies in this area have been conducted in high-income Western countries, and that findings may look different in other contexts where criminal behaviour is recorded, prosecuted, and registered differently. A further observation concerns gender: similar personality profiles may lead to different diagnoses depending on whether the patient is male or female, with implications for how we interpret the research and for equity in clinical practice.

Systematic review and meta-analyses of nonpharmacological interventions for co-occurring chronic pain and posttraumatic stress disorder.

PAIN 167(4):p 756–766, April 2026. DOI: 10.1097/j.

O'Donnell ML, Arjmand HA, Lumley MA, Seal K, Mani R, Sterling M, Reed DE 2nd, Sbisa A, Bair MJ, Bown S, Dupuis G, Forbes D, Maher P, McFarlane AC, Moseley GL, Otis J, Pedlar D, Richardson JD, Fredrickson J, Maunder L, Dick D, Wilkinson E, Bennett L, Blank J, Varker T.

Dr. David Pedlar is a co-author on a systematic review and meta-analysis published in The Lancet examining nonpharmacological treatments for the frequently co-occurring conditions of chronic pain and PTSD – an area where clinicians have long faced a significant evidence gap. Drawing on 30 randomized controlled trials and more than 3,200 participants, the study found that trauma-focused therapies improved both PTSD symptom severity and pain intensity, while cognitive-behavioural, mind-body, and other non-targeted approaches showed no significant benefit for either outcome. The findings suggest that any effective treatment for people living with both conditions should, at minimum, include a trauma-focused component – a practical, actionable takeaway for clinicians and a meaningful step toward closing a gap that has left many patients without evidence-based options.

PRESTIGIOUS RECOGNITION ACROSS OUR TEAMS

Inaugural IMHR Distinguished Research Leadership Award

This year, we launched the IMHR Distinguished Research Leadership Award – a merit-based recognition program designed to celebrate outstanding scholarly achievement, research leadership, and contributions aligned with the Research Institute's strategic priorities. These awards, two each for Senior Scientists and Scientists, reflect our commitment to fostering a culture of excellence and retaining high-calibre talent.

In the Senior Scientists category, **Dr. Michael Seto**, clinical and forensic psychologist, Research Director, and a leading voice in forensic mental health, was honoured for decades of rigorous scholarship on sexual offending, risk assessment, and the complex needs of individuals at the intersection of mental health and justice systems – work with profound implications for public safety and rehabilitation. His contributions bring important distinction to The Royal and the IMHR, reinforcing the value of research that engages directly with difficult questions in service of better outcomes for individuals, families, and communities.

Dr. Stuart Fogel was recognized for his internationally renowned research on sleep, memory, cognition, and brain health, including recent work supported by a Weston Foundation grant exploring how sleep processes may help preserve memory and cognitive function in neurodegenerative diseases. This work reflects the kind of rigorous, translational, and patient-centred science that strengthens the IMHR's mission and contributes meaningfully to the development of new, evidence-based approaches for patients, families, and caregivers.

In the Scientists category, **Dr. Rébecca Robillard**, newly appointed as the Ottawa Academic Health Network University Research Chair in Sleep and Mental Health, was honoured for her leadership in sleep and mental health research. She is advancing an area of growing scientific, clinical, and public health importance: the relationship between how we sleep, how we feel, and how brain and mental health unfold across conditions and life stages.

Dr. Synthia Guimond was recognized for her leadership in cognitive remediation, neuroimaging, and digital approaches to care through the Cognitive Remediation and Neuroimaging Laboratory, advancing evidence-based interventions for cognitive dysfunction in psychiatric disorders. Her research interests – including cognition, memory, social cognition, schizophrenia, depression, cognitive remediation, virtual reality, digital technology, MRI, EEG, and PET – reflect a highly integrated and forward-looking program of research.

Each recipient received a financial award to be used at their discretion in support of their research and professional goals.

Other Awards

Research Institute Scientific Director **Dr. Jennifer Phillips** received an Exceptional Leadership Award from the University of Ottawa, recognizing alumni demonstrating outstanding leadership and dedication to their communities.

Dr. Sara Tremblay received a Brain Canada Foundation Momentum grant, building on a 2019 Brain Canada award. The new grant (\$200,000 over two years), entitled 'Measuring Neuroplasticity Outcomes of Theta Burst Stimulation in Depression Using Advanced PET Imaging', continues to connect the neuromodulation research clinic and the Brain Imaging Centre to advance research-based care.

Dr. Stuart Fogel was awarded a Weston Family Foundation grant: "Targeted enhancement of sleep to restore sleep-dependent memory consolidation in prodromal dementia". With the \$300,000 over two years, Fogel and his team will enhance sleep by targeting these markers using natural health products, with the aim of consequently restoring the boost that sleep affords to memory processing.

Dr. Naista Zhand was awarded a uOttawa internal tier 2 Clinical Research Chair Award (Schizophrenia) for five years (\$100,000/year). This is a progression from her initial uOttawa junior Clinical Research Chair, testament to her research career development through clinical trials for people with schizophrenia.

Dr. Benoit Mulsant, Interim Psychiatrist-in-Chief and Chief of Staff at The Royal, was appointed a Fellow of the Royal Society of Canada, the highest recognition in the Arts, Humanities, Social Sciences, and Sciences in our country. The extraordinary achievement reflects Mulsant's outstanding contributions to research, scholarship, and the advancement of psychiatric practice in Canada. Mulsant was also appointed as Senior Physician Scientist at the IMHR.

Dr. Pierre Blier won the Pioneer Award from the International College of Neuropsychopharmacology in June 2025. The Pioneer Award is given at each World Congress of Neuropsychopharmacology to honour those who have made major contributions to the growth of the field.

Dr. Tanya Halsall received a 2025 Emerging Community-Based Researcher Honourable Mention in May 2025. These awards recognize outstanding contributions to the impactful community-campus research partnerships and the emerging community researchers in Canada, honouring those whose work exemplifies the power of community-driven research to advance equity, justice, and real-world change.

Research Institute Board & Committees

Research Institute Board committees include additional voting members from stakeholder groups, as well as non-voting participants as noted below.

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Frances McRae

Cara Vaccarino

Michael von Herff

Florence Dzierszinski (Non-Voting, Ex-officio)

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Suzie Gignac (Public member)

Emilie Wilcox (Public Member)

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Donna Wong

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Meghan Hanley

Lewis Leikin

Martine Lagacé

Duncan Stewart

Cara Vaccarino

Glenda O'Hara (Client Advisory Council)

Floyd Kelly (Family Advisory Council)

Steve Adams (Public member)

Kevin Fitzgibbons (Public member)

Diana Sarakbi (Public member)

Florence Dzierszinski

Non-Voting Participants

Katie Dinelle

Chris Ide

Benoit Mulsant

Alyssa Nader

Jennifer Phillips

Jakov Shlik

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Ruth Lanius, MD, PhD

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Jennifer Payne, MD

Jennifer Phillips, PhD

Mark Salter, PhD

Dawn Stacey, RN, PhD

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Kayal Miguez, MSc, BCL, JD, MHE

Glenda O'Hara, BComm (Hon)

Sabrina Paterniti MD, PhD

Pascal Roberge, MD, PhD

Zeynep Selaman, BSc, MD, FRCPC

Jennifer Shames, MSc

Caitlin Sigg, MA, RP, PhD

Reggie Taylor, PhD

Carlie Chase, Ad Hoc Reviewer

Athena Gris, BA (in progress), Ad Hoc Reviewer

Alexis Dorland, MSc, (non-voting)

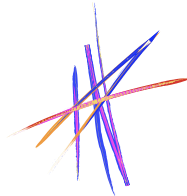
Things to Watch for in FY2027



CONTINUED GROWTH OF INTERVENTIONAL PSYCHIATRY AND LINKS TO URGENT CARE CLINIC



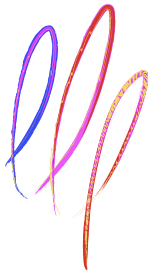
2027 CFI INNOVATION GRANT APPLICATION, TO FUND LARGE-SCALE AMBITIOUS, INTERDISCIPLINARY AND COLLABORATIVE RESEARCH



INSTALLATION OF NEW SCANNER AND LAUNCH OF TRI-MODAL IMAGING



CANADA RESEARCH CHAIR TIER 1 RECRUITMENT



WAVERLEY HOUSE ACCELERATOR FOR MENTAL ILLNESS AND ADDICTION RESEARCH LAUNCH AND RECRUITMENT



MENTAL HEALTH & ADDICTION POLICY THINK TANK



2 NEW CLINICAL RESEARCH CHAIRS



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Ottawa, Ontario, Canada K1Z 7K4

Dr. Florence Dzierzinski
President and CEO, Research Institute / VP Research, The Royal

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