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Thunder Bay Regional Health Research Institute

**2022-2023
Annual Report**



Thunder Bay Regional
Health Research
Institute

Message from the CEO and Board Chair



As we reflect on this past year, it is with pride and a renewed sense of purpose that we write this report.

Last June, Thunder Bay Regional Research Institute (TBRHRI) and Thunder Bay Regional Health Sciences Centre (TBRHSC) released our first ever joint strategic plan, Strategic Plan 2026. The priorities identified as a result of extensive engagement with stakeholders from across Northwestern Ontario reflect our organizations' values: diversity, compassion, excellence, innovation and accountability.

When contemplating our strategic priority of Research, Innovation and Learning, we recognize that it is the excellence of our Scientists, clinical trials and research staff that advances health care research at our institute, and we want to extend our sincere appreciation and gratitude to the entire team for the leadership and innovation they continually demonstrate.

Our Scientists have had tremendous success obtaining research funding this year, with more than \$4 million in grants awarded. Through this funding support, our team is conducting research in medical imaging, oncology, brain injury, HPV, COVID-19, mental health and addictions and health care data, areas strategic to regional health care needs.

Hospital-based research is important to the patients we serve and plays a vital role in our health care system. Collectively, the Research Institute's staff and leaders work diligently to support and enable our scientists. As a result, our combined efforts with partners locally, provincially, and across the country, continues to revolutionize health care for the people of Northwestern Ontario.

Research that directly impacts patient care is particularly important to our community, through the care we provide and moving our research further as a Research Institute. In collaboration with TBRHSC and NOSM University, both Dr. Hazem Elmansy and Dr. Walid Shahrour, have been working diligently to advance care for the urology patients we serve throughout our region to propel us as a leader in surgical management and clinical research in the field of urology. Together with many of our staff and partnerships, we are working towards building a world-class hub for urology care.

Another example of successes is the research being conducted by Dr. Alla Reznik, TBRHRI Scientist, Canada Research Chair in Physics of Molecular Imaging at Lakehead University (LU) and Chief Scientific Officer at Radialis Medical. This dedicated team continues to advance medical imaging using organ-targeted positron emission tomography (PET) scanner. Last year, her locally developed PET scanner received FDA clearance to market in the United States. Her team continues to explore and expand use of the patented medical imaging device. Her next study is an investigation to improve prostate cancer diagnosis by accurately identifying the aggressiveness of a tumour using of a combination of transrectal ultrasound and prostate-targeted PET.

Another momentous achievement this year was when our Chief Scientist, Dr. Christopher Mushquash, was honoured with the 2023 Canada Gairdner Momentum Award for his work in Indigenous-led mental health and substance use research. The Gairdner Foundation's annual awards recognize and celebrate researchers from around the world for their excellence in fundamental research that impacts human health. Dr. Mushquash's work is building a framework to better serve Indigenous communities through partnerships and collaborations with Indigenous communities.

Looking to the year ahead, we have much to be excited about with ongoing research initiatives, partnerships and training. As a Research Institute working in collaboration with a Hospital, we firmly believe that innovation and technology will drive us into the future of health care, improving health and health care resources for the people of Northwestern Ontario.

Dr. Rhonda Crocker Ellacott
President and CEO, Hospital,
and CEO, Thunder Bay Regional
Health Research Institute

Dr. Andrew Dean
Chair, Thunder Bay Regional
Health Research Institute
Board of Directors

Board of Directors

(as of March 31, 2023)

Executive:

Dr. Andrew Dean
(Chair)

Dr. Pam Wakewich
(Vice Chair)

James Peotto
(Treasurer)

Ex-Officio:

Dr. Rhonda Crocker Ellacott, PhD
(CEO)

Tim Larocque
(Director, Applied Research &
Innovation, Confederation College)

Dr. David C. Marsh
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Innovation and International,
NOSM University)

Dr. Christopher Mushquash
(VP Research, TBRHSC and Chief
Scientist, TBRHRI)

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Andrew Ross

John Dixon

Peter Bishop

Jocelyn Bel

Dr. Erin Cameron

Community Members:

Barry Streib
(TBRHS Foundation Board of
Directors Representative)

Message from the Vice President Research and Chief Scientist



The past year at the Thunder Bay Regional Health Research Institute (TBRHRI) was marked by incredible collaborations and opportunities to build the future of research in our Institute, Hospital, and region. We began to see a substantial increase in the number of new research projects, setting a new high water mark at 51 authorized studies. The optimism felt within our Institute is welcomed, after the last few years of the COVID-19 emergency.

Several TBRHRI researchers received grants from the Canadian Institutes of Health Research (CIHR) in the areas of cancer, and mental health and learning health system evaluation in the northern, rural, and remote contexts.

Dr. Mitch Albert's team at TBRHRI/Lakehead University (LU) was part of a multi-site study conducting research using hyperpolarized xenon-128 magnetic resonance imaging to investigate gas exchange in the lungs of people suffering from long-COVID. Funded by the Ontario COVID-19 Rapid Research Fund, this research found impaired pulmonary transfer correlated to pulmonary vascular changes detected by CT scanning. This finding is important in the future development of treatment options for patients with long-COVID.

Dr. Michael Campbell and his team was focused on the development of new methods and tools to allow simpler and more economic access to, and utilization of, radionuclides for research in industry and health care.

Dr. Jinqiang Hou and his team worked on building machine learning models to investigate if machine learning is able to identify the 'bioactive' features of peptides and use the features to accurately discriminate between binding and non-binding small molecules. This work has implications for the future of drug development. Dr. Hou strives to create novel molecules that can serve as both therapeutic tools and diagnostic imaging agents, promoting disease prevention, early detection, and image-guided treatment through a combination of basic chemistry, medicinal chemistry, and applied research. The partnership between Lakehead University and Thunder Bay Regional Health Research Institute is crucial in making this innovative research possible.

Dr. Alla Reznik is working to improve prostate cancer diagnosis by accurately categorizing tumours to identify their true aggressiveness. She and her team will achieve this goal over five years by developing a next-generation imaging system based on a combination of prostate-targeted Positron Emission Tomography and transrectal ultrasound imaging. Dr. Reznik has two PhD students and a Master of Science student who will assist in this ground-breaking research, supporting the development of future scientists.

Dr. Guillem Dayer continued to focus on the evaluation of antibodies raised against a viral HPV16 protein. These new molecules – initially developed in Dr. Ingeborg Zehbe's lab as part of one of his post-doctoral projects – show great potential for clinical diagnostics and research applications. Alongside his research work, he is the Biosafety Officer and Research Project Assistant, supporting other ongoing projects at the TBRHRI.

Dr. Brianne Wood, Associate Scientist (NOSM University, TBRHRI, Thunder Bay Regional Health Sciences Centre), began work on creating a national community of practice focused on implementing and evaluating learning health systems in northern, rural, and remote regions, with a specific focus on mental health. These findings will help advance and assess digital transformation in TBRHSC and Northwestern Ontario.

Through collaborative partnerships, innovation and tremendous efforts, TBRHRI scientists are fostering a health research ecosystem to revolutionize health care for the people of Northwestern Ontario and beyond. Thank you to the Scientists, Associate Scientists, research teams, and trainees for your incredible work in 2022-2023. I am looking forward to what the next year brings.

Dr. Christopher Mushquash

Vice President Research, Thunder Bay Regional Health Sciences Centre
and Chief Scientist, Thunder Bay Regional Health Research Institute

Scientists

Dr. Mitchell Albert

Lakehead University/
TBRHRI Research Chair
in Molecular Imaging and
Advanced Diagnostics
Professor of Chemistry,
Lakehead University
Adjunct Professor of
Biology, Biotechnology,
Health Sciences, and
Physics, Lakehead
University Adjunct Professor
of Medical Sciences, NOSM
University Scientist, TBRHRI

Dr. Michael Campbell

Lakehead University/
TBRHRI Research Chair
in Radiochemistry for
Molecular Imaging and
Advanced Diagnostics
Assistant Professor,
Department of Chemistry,
Lakehead University
Scientist, TBRHRI

Dr. Alla Reznik

Canada Research Chair
in Physics of Molecular
Imaging Associate
Professor, Department
of Physics, Lakehead
University Scientist, TBRHRI

Dr. Jinqiang Hou

Lakehead University/
TBRHRI Research Chair in
Radiochemistry Assistant
Professor in the Department
of Chemistry, Lakehead
University Scientist, TBRHRI

Dr. Zubair Fadlullah, PhD (Until December 2022)

Lakehead University/
TBRHRI Research Chair in
Smart Health Technology
Associate Professor in
Department of Computer
Sciences, Lakehead
University Scientist, TBRHRI

Associate Scientists

Dr. Brianne Wood

Dr. Guillem Dayer

Dr. Sasha Bubon

Dr. Christopher Mushquash, PhD, C. Psych

Vice President Research, TBRHSC, and Chief Scientist, TBRHRI, Canada Research Chair in Indigenous Mental Health and Addiction, and Professor in the Department of Psychology at Lakehead University and the Division of Human Sciences at the NOSM University



Dr. Mitchell Albert

Lakehead University/ TBRHRI Research Chair in Molecular Imaging and Advanced Diagnostics Professor of Chemistry, Lakehead University Adjunct Professor of Biology, Biotechnology, Health Sciences, and Physics, Lakehead University Adjunct Professor of Medical Sciences, NOSM University Scientist, TBRHRI



Awards

2022 CPA Clinical Section Award for Clinical Excellence. Led by Dr. Martin Drapeau (Lead Researcher, McGill University) and Dr. Maxine Holmqvist (Lead Clinician, University of Manitoba), Dr. Mushquash contributed to the development of the Best Practices in Psychology Portal.

2023 Canada Gairdner Momentum Award Dr. Mushquash was recognized for his work in Indigenous-led mental health and substance use research.

Grants

Poulin, P. A., Koscielniak, A., Mushquash, C., Furlan, A., Ray, L., Francis, P., Trudeau-Magiskan, T., Shergill, Y., Rice, D., Prince, H., et al. Developing a Culturally Safe Evaluation and Research Plan for the Indigenous Chronic Pain and Substance Use Project Extension for Community Health Outcomes. \$24,600; CIHR Planning and Dissemination Grant: Institute Community Support competition. 2022-2023.

Wood, B., Meservia-Collins, K. (PIs), Cameron, E., Mushquash, C., Nicholas, B., & Raynak A. (Co-Is). Mobilizing and evaluating a multi-level learning health system: Examining the influence and impacts of northern, rural, and remote context. \$100,000; CIHR Catalyst Grant: Quadruple Aim and Equity. 2022-2023.

Publications

Aker, A. M., Serghides, L., Cotnam, J., Jackson, R., Robinson, M., Gauvin, H., Mushquash, C. J., Gesink, D., Amirault, M., & Benoit, A. C. (submitted). The impact of a stress management intervention including cultural components on stress biomarker levels and mental health indicators among Indigenous women. Manuscript accepted to Journal of Behavioral Medicine on Jan 3, 2023.

Drawson, A.S., Toombs, E., Blain, J., Bobinski, T., Dixon, J., Paavola, N, & Mushquash, C.J.. The Development of the First Nations Children Wellbeing Measure. Manuscript accepted to International Journal of Child and Adolescent Resilience on Sept 23, 2022.

Reynolds, A., Keough, M. T., Blacklock, A., Tootoosis, C., Whelan, J., Bomfim, E., Mushquash, C., Wendt, D., O'Connor, R., & Burack, J. (accepted). The impact of cultural identity, parental communication, and peer influence on substance use among Indigenous youth in Canada. Manuscript accepted to Transcultural Psychiatry on June 27, 2022.

Toombs, E., Lund, J., Radford, A., Drebit, M., Bobinski, T., & Mushquash, C. J. (accepted). Adverse childhood experiences (ACEs) and health histories among Indigenous clients seeking treatment for substance use. Manuscript accepted to International Journal of Mental Health and Addiction on June 22, 2022.

Toombs, E., Mushquash, C., Leon, S., McKenzie, K. (2022). Thriving in three Northwestern Ontario communities. International Journal of Mental Health.

Leung, T., Schmidt, F., & Mushquash, C. (2022). Personal trauma history and experience of secondary trauma stress, vicarious trauma, and burnout. Psychological Trauma, advance online publication. <https://doi.org/10.1037/tra0001277>

Toombs, E., Lund, J., Mushquash, A. R., & Mushquash, C. J. (submitted). Predictors of land-based activity participation in a national representative sample of indigenous individuals living off-reserve. Manuscript submitted to International Journal of Environmental Research and Public Health on April 29, 2022

Goetz, C., Maranzan, A., & Mushquash, C. J. (submitted). An integrative review of barriers and facilitators associated with mental health help-seeking among indigenous populations. Manuscript submitted to Psychiatric Services on April 30, 2022.

Toombs, E., Lund, J., Radford, A., Drebit, M., Bobinski, T., & Mushquash, C. J. (submitted). Adverse childhood experiences (ACEs) and health histories among Indigenous clients seeking treatment for substance use. Manuscript submitted to International Journal of Mental Health and Addiction on April 9, 2022.



Grants

Ontario Research Fund-Research Excellence (Awarded \$2,415,470) "Ontario Network of Excellence for Translation of Hyperpolarized MRI Technologies"

NSERC Alliance (Awarded \$1,150,000) "Enhanced sensitivity HP-gas MRI/PET Dual Modality Imaging for Alzheimer's disease Detection"

MITACS Accelerate Grant (Awarded \$720,000) "Functional and Molecular Imaging using Hyperpolarized Xenon-129 Magnetic Resonance Imaging"

Patents

New patent awarded: "In Vivo detection of a Xenon-Binding Cage Molecule", US 11,229,712 B2

Publications

G. Parraga, et al. 129Xe MRI Ventilation Defects in ever- and never-hospitalised people with post-acute COVID-19 Syndrome. BMJ Resp. 2022

Y. Shepelytskyi, et al. Hyperpolarized 129Xe imaging of the brain: Achievements and Future Challenges. Magn. Reson. Med. 2022

A. Matheson, et al. Persistent 129Xe MRI Pulmonary Abnormalities in Never-hospitalized people with post-acute COVID-19 syndrome. Radiology (in press)

A.M. Matheson, et al. Persistent 129Xe MRI Pulmonary and CT Vascular Abnormalities in Symptomatic Individuals with Post-Acute COVID-19 Syndrome. 28 Jun 2022 <https://doi.org/10.1148/radiol.220492>

H.K. Kooner, et al. 129Xe MRI ventilation defects in ever-hospitalised and never-hospitalised people with post-acute COVID-19 syndrome. BMJ Open Respiratory Research, 9(1), 2022

Dr. Alla Reznik

Canada Research Chair in Physics of Molecular Imaging Associate Professor, Department of Physics, Lakehead University Scientist, TBRHRI



Grants

CIHR Project Grant "Prostate-targeted PET/TRUS dual-modality imaging system for diagnosis and image-guided biopsy" (Awarded \$738,270)

MITACS Accelerate Grant "Advanced technologies for breast imaging" (Awarded \$360,000)

Health Sciences Foundation Grant Applications "Radialis PET Camera" (Awarded \$458,505), In collaboration with Dr. Olexiy Aseyev, Clinical Oncologist, TBRHSC

Clinical Trials and Commercialization

Clinical trials with the Radialis PET camera are underway. Second clinical prototype is under the assembly and testing.

Publications

T. Thibault, et al. Investigation of dark current mechanisms in a polyimide blocking layer utilized in an amorphous lead oxide-based x-ray detector. Proc. SPIE 12031, Medical Imaging 2022: Physics of Medical Imaging, 120314J <https://doi.org/10.1117/12.2613179> 2022

O. Grynko, et al. Charge recombination and electron-hole pair creation energy in amorphous lead oxide x-ray photoconductor. Proc. SPIE 12031, Medical Imaging 2022: Physics of Medical Imaging, 120314M <https://doi.org/10.1117/12.2612937> 2022

O. Grynko and A. Reznik. Progress in Lead Oxide X-Ray Photoconductive Layers. Book Editor(s):Safa O. Kasap, Published: 17 June 2022 <https://doi.org/10.1002/9781119579182.ch16>

T. Thibault, et al. Dark Current Modeling for a Polyimide-Amorphous Lead Oxide-Based Direct Conversion X-ray Detector. Sensors 2022, 22(15), 5829; <https://doi.org/10.3390/s22155829>, 2022

J. Stiles, et al. Evaluation of a High-Sensitivity Organ-Targeted PET Camera. Sensors 2022, 22(13), 4678; <https://doi.org/10.3390/s22134678> 2022

O. Grynko, et al. Charge Extraction by Linearly Increasing Voltage (CELIV) Method for Investigation of Charge Carrier Transport and Recombination in Disordered Materials. Book Editor(s):Safa O. Kasap, <https://doi.org/10.1002/9781119579182.ch16> 2022

E. Pineau, et al. Comparative Analysis of Multilayer Lead Oxide-Based X-ray Detector Prototypes. Sensors 2022, 22(16), 5998; <https://doi.org/10.3390/s22165998> 2022

Dr. Michael Campbell

Lakehead University/ TBRHRI Research Chair in Radiochemistry for Molecular Imaging and Advanced Diagnostics Assistant Professor, Department of Chemistry, Lakehead University Scientist, TBRHRI



Grants

Infrastructure Operating Fund (Awarded \$23,650) Primary Applicant: Dr. JQ Hou; Co-applicant: Dr. Michael Campbell, Dr. Justin Jiang

Publications

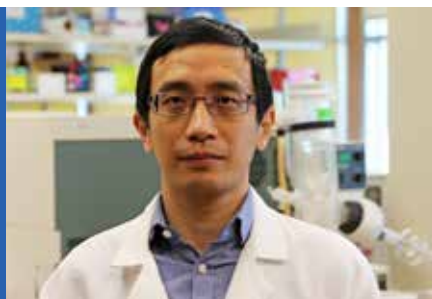
J. Allingham, M. Campbell, W. Floriano. Brightening Up Brain Injuries: Design, Synthesis and Characterization of a PET Diagnostic Agent for Neuronal Trauma. In: Pissaloux, E., Papadopoulos, G.A., Achilleos, A., Velázquez, R. (eds) ICT for Health, Accessibility and Wellbeing. IHAW 2021. Communications in Computer and Information Science, vol 1538. Springer, Cham. https://doi.org/10.1007/978-3-030-94209-0_8 2022

Abraham, C.B., Dadgar, S., Floriano, W.B., Campbell, M. and Curiel, L. Exposure to Long Magnetic Resonance Imaging Thermometry Does Not Cause Significant DNA Double-Strand Breaks on CF-1 Mice. Journal of Modern Physics, 13, 839-850. <https://doi.org/10.4236/jmp.2022>

Zhao D, Kovacs A, Campbell M, Fluoriano W, Hou J. Exploring the structural basis of a subtype selective inhibitor for Aurora kinase B over Aurora kinase A by molecular dynamics simulation. Journal of Computer-Aided Molecular Design. Submission ID 226089ba-d902-4249-b8d7-9dd2c42769c1. 2022

Dr. Jinqiang Hou

Lakehead University/ TBRHRI Research Chair in Radiochemistry Assistant Professor in the Department of Chemistry, Lakehead University Scientist, TBRHRI



Awards

Two graduate students won prestigious Queen Elizabeth II Graduate Scholarships:

- Dong Zhao - Amount awarded: \$15,000
- Austin Hopkins - Amount awarded: \$15,000

Grants

Infrastructure Operating Fund (IOF) (Awarded \$23,650) Co-applicant: Dr. Michael Campbell, Dr. Justin Jiang

Publications

W. Liu et al. Can Machine Learning Transform Peptides/Peptidomimetics into Small Molecules? A Case Study with Ghrelin Receptor Ligands. Molecular Diversity <https://doi.org/10.1007/s11030-022-10555-w> 2022

D. Zhao et al. Exploring the structural basis of a subtype selective inhibitor for Aurora kinase B over Aurora kinase A by molecular dynamics simulation. Journal of Computer-Aided Molecular Design. Submission ID 226089ba-d902-4249-b8d7-9dd2c42769c1 2022

Y.H. Zhang et al. A red fluorescent small-molecule for visualization of cyclic dimeric guanosine monophosphate (c-di-GMP) tetramer in live bacterial cells and real-time monitoring of biofilm formation on biotic and abiotic surfaces. Sensors and Actuators B: Chemical. Manuscript ID: SNB-D-22-05439, 2022

Y. Xu et al. Bioinformatic assay reveal the potential mechanism of Guizhi-Shaoyao-Zhimu decoction against rheumatoid arthritis and mild-to-moderate COVID-19. Methods and Programs in Biomedicine, 2022

A.H. Kovacs et al. Aurora B Inhibitors as Cancer Therapeutics, Molecules 28 (8), 3385

B.X. Zheng et al. A Cytoplasm-Specific Fluorescent Ligand for Selective Imaging of RNA G-quadruplexes in Live Cancer Cells Chemistry-A European Journal, e202300705, 2022

W. Long et al. Rational design of small-molecules to recognize G-quadruplexes of c-MYC promoter and telomere and the evaluation of their in vivo antitumor activity against breast cancer Nucleic acids research 50 (4), 1829-1848, 2022

Dr. Christopher Mushquash honoured with prestigious Canada Gairdner Momentum Award

The 2023 Canada Gairdner Award recipients have been announced, and local clinical psychologist Dr. Christopher Mushquash is being honoured for his work in Indigenous-led mental health and substance use research.

Dr. Mushquash is Vice President of Research at Thunder Bay Regional Health Sciences Centre (TBRHSC), Chief Scientist at the Thunder Bay Regional Health Research Institute (TBRHRI), a Canada Research Chair in Indigenous Mental Health and Addiction, Professor at Lakehead University and NOSM University, and psychologist at Dilico Anishinabek Family Care.

In his work, Dr. Mushquash investigates Indigenous mental health, substance use, trauma, and general mental wellness. He partners with communities, government and academia and uses evidence-based approaches in alignment with First Nations values to ensure his research and its outcomes are culturally — and contextually — appropriate for people in First Nations, rural and northern communities.

“The goals of the research are rooted in the medicine wheel, in the four interconnected directions,” explained Dr. Mushquash. “We want to identify culturally — and contextually — appropriate targets of intervention, develop methods to measure outcomes; develop and test interventions that incorporate culture-based knowledge with

scientific methods; and share the knowledge among Indigenous and academic communities, clinicians, and policymakers.”

Established in 1957, the Gairdner Foundation’s annual awards recognize and celebrate researchers from around the world for their excellence in fundamental research that impacts human health. Over the years, 402 awards have been presented to people from more than 40 countries and of those awardees, 96 have gone on to receive Nobel Prizes. Dr. Mushquash is a recipient of the 2023 Canada Gairdner Momentum Award.

“It is truly an honour to receive this award,” said Dr. Mushquash. “The work we are doing, the partnerships being built, will improve mental health systems and services for Indigenous Peoples. We are building a framework to better serve Indigenous communities.”

“Congratulations to Dr. Mushquash for being recognized for his exemplary and ground breaking work,” said Dr. Rhonda Crocker Ellacott, President and CEO of TBRHSC and CEO of TBRHRI. “His research and advocacy demonstrates the power of responsive mental health and addiction services. His research is affecting real change for people and making significant and lasting improvements in care and outcomes, while informing best practices across the country.”

“The Gairdner Momentum Award recognizes exceptional early- to mid-career researchers whose research is having significant impact in the health field now and in the future,” said Dr. Andrew P. Dean, Lakehead University’s Vice President, Research and Innovation. “There is no doubt that the research being done by Dr. Mushquash clearly fits this criteria. His work is vital to understanding the effectiveness of treatments for mental health and addictions for people in Northwestern Ontario. In particular, his research will improve the health outcomes and services for Indigenous populations in our region.”

“Dilico Anishinabek Family Care is thrilled to see Dr. Christopher Mushquash receive this honourable award for his dedication and excellence in indigenous and community based research. He is truly an Indigenous mental health and addictions research champion. We are grateful for the commitment Dr. Mushquash has for indigenous led and culturally centered research initiatives; his work is leading the way for improved mental wellness outcomes for Indigenous people.” said Darcia Borg, Executive Director.

You can find out more about Dr. Mushquash’s work at <https://www.christophermushquash.com/>.



Canadian researchers using cutting edge technology to investigate long-COVID



In a multi-site study funded by the Ontario COVID-19 Rapid Research Fund, scientists discovered a clue into the cause of post-acute COVID-19 syndrome (PACS), also known as long-COVID.

Through Western University, researchers used novel lung imaging techniques to investigate gas exchange in the lungs of people suffering from long-COVID. This exploratory study used hyperpolarized xenon-129 magnetic resonance imaging (HP 129Xe MRI) and computed tomography (CT) scans to visualize the flow of oxygen through the lungs and where it is blocked.

The technique used to support this study is based on the technique co-invented by Dr. Mitchell Albert, Lakehead University—Thunder Bay Regional Health Research Institute Research Chair in Molecular Imaging and Advanced Diagnostics and uses the HP 129Xe MRI technology. As a graduate student at The State University of New York at Stony Brook, Dr. Albert co-invented this powerful diagnostic technology that allows you to see how the lungs are functioning in real time. Since then it has been applied to several important biomedical areas, including this study.

“It’s really gratifying to see that after 25 years, our invention now is turning out to be important in the use of discovering what is

happening in patients with post-acute COVID-19,” says Albert. “Not a lot is known about long-COVID yet. People have these lingering symptoms lasting months and months, and no one really understands why this is. This study starts to shed light on what is happening in the lungs, what the problem is, and the fact that there is indeed a physical problem.”

Albert is referring to the fact that for people with long-COVID can suffer from symptoms including shortness of breath, brain fog and fatigue, where traditional methods of assessing the lungs (i.e. pulmonary function tests, CT scans, chest x-rays) may not indicate there is an issue in the lungs. Using HP 129Xe MRI changes that.

“You can think about hyperpolarized xenon like a tracer that allows you to see how the gas behaves within the lungs. So by using the HP 129Xe, we are able to trace the pulmonary gas exchange and literally see how oxygen is transferred into the bloodstream,” explains Yurii Shepelytskyi, post-doctoral researcher in Albert’s lab. “In this study, we looked at post-acute COVID-19 syndrome to see how the gas transfer changes in subjects who had COVID-19 and who were previously hospitalized over those people not hospitalized. We found that the amount of gas transferred

into the blood is significantly smaller in subjects who had COVID-19, indicating a gas transfer impairment.”

Albert’s team at Lakehead University / Thunder Bay Regional Health Research Institute is one of five sites conducting research for this study. In this collaborative study, the impaired pulmonary transfer has been correlated to pulmonary vascular changes detected by CT scanning. This initial discovery is important as in order to develop treatment options for patients with long-COVID, the source of the issue must be identified.

“Next steps are to continue the research and follow up with the patients to determine if they have fully recovered, or if their symptoms persist. This information will be useful to health care providers to provide guidelines for treating patients with long-COVID,” says Albert. “We are very excited to be a part of this groundbreaking study that will help people all across the province and beyond. Thank you to TBRHRI for allowing us use of the 3T MRI, and to Lakehead University for providing seed funding that allows us to do this incredible work right here in Northwestern Ontario. Finally, I am grateful to the Ministry of Health for making this research possible and to Grace Parraga, the study leader, for inviting us to participate.”

Funding from Thunder Bay Regional Health Sciences Foundation Supports New Breast Cancer Screening Tool

Everyone who bought a Thunder Bay 50/50 ticket during the month of October 2022 contributed to a piece of Thunder Bay history. That’s because half of all proceeds went directly to breast cancer including the new Radialis unit, a revolutionary alternative to X-ray mammography that was developed and will be manufactured right here in Thunder Bay.

Dr. Alla Reznik and her team have worked for about ten years developing this new technology from scratch. The technology detects breast cancer tumours using molecular imaging. That’s a much more precise and efficient method of diagnosing breast cancer for women who have dense breast tissue, which is about half of all women. And, it does all this without painful compression of the breast during imaging.

Radialis was not designed to replace mammography, but instead provide an alternative for those women who need it.

“Mammography saves lives. Mammography is the gold standard in detecting breast cancer. But mammography is efficient only for 50% of all women,” Dr. Reznik said. “For those women for whom mammography is not efficient, we need to offer another detection tool.” Mammography is what Dr. Reznik called an indirect cancer detection tool – one that detects cancers based on expected density differences between a tumour and breast tissue. Tumours can be missed in some women because there isn’t enough contrast in the X-ray mammography between dense breast tissue and dense tumour tissue. Further, false positives or questionable results can trigger a number of other treatments and tests that can be painful and stressful. That’s something Dr. Reznik saw happen to a close friend.

“(The results she received were) suspicious but inconclusive,” she said. Thankfully, a biopsy revealed her friend didn’t have cancer. However with

Radialis, she wouldn’t have needed a biopsy at all. Women who experience these painful tests after false positives are less likely to get mammograms in the future. “I don’t want anybody to experience false-positive results.”

Radialis can also be used to monitor treatments earlier and more effectively, allowing doctors to try something different if the initial treatment isn’t working.

“This is very much aligned with personalized medicine,” Dr. Reznik said. “It’s a game changer.”

The first round of clinical trials has already successfully completed at Princess Margaret Cancer Centre in Toronto with a second round about to begin. Clinical trials are planned to start in Thunder Bay in April 2023 to test how well the unit can be used for monitoring certain breast cancer treatments. Dr. Reznik said that she is also in discussions with other hospitals including one in the United States to build systems.

Radialis has received FDA clearance and will begin manufacturing its molecular imaging units right here in Thunder Bay. That has always been an important goal for Dr. Reznik and her team, she said.

“If we just sell our technology to a manufacturer, then the manufacturing will be moved out of Thunder Bay. But we are committed to our region and even if Radialis is at some point purchased by a larger company, manufacturing will stay in Thunder Bay.”

Some of the proceeds of the Thunder Bay Regional Health Sciences Foundation’s October 2022 Thunder Bay 50/50 draw went directly to building prototypes needed for testing and clinical trials including purchasing component parts.

“Every ticket bought helped fund research that will benefit hundreds of patients in Thunder Bay with a direct way to diagnose breast cancer and a direct way to follow up with their treatment,” Dr. Reznik said.



Radialis Positron Emission Tomography (PET) Imager Supporting Clinical Trials

Through the use of funds provided by the Thunder Bay Regional Health Sciences Foundation, a PET Imager from Radialis Inc. for use in clinical trials was purchased. To support the sponsorship of clinical trials TBRHRI will take on the role and Dr. Olexiy Aseyev, Medical Oncologist will be developing the first research protocol for using the PET Imager. The Radialis PET Imager is intended for medical purposes to image and measure the distribution of injected positron emitting radiopharmaceuticals in human beings for the purpose of determining various metabolic and physiologic functions within the human body. It is anticipated that the recruitment for this research study will begin in early 2023/2024 with the support of Radialis.

Thunder Bay Regional Health Sciences Centre & Thunder Bay Regional Health Research Institute

Thunder Bay Regional Health Sciences Centre (TBRHSC) is a 375-bed acute care facility and academic health sciences centre. As the only tertiary health care provider in the region, Thunder Bay Regional Health Sciences Centre provides comprehensive care to more than 245,000 people in a region the size of France. TBRHSC teaches the next generation of health care providers and advances medical research through the Thunder Bay Regional Health Research Institute (TBRHRI). Patients benefit from interprofessional teams of dedicated health care providers and access to leading-edge medical technology and clinical trials. TBRHSC is proudly affiliated with Lakehead University, Confederation College and NOSM University. TBRHSC operates on sacred land. We respectfully acknowledge that we work on the traditional lands of the people of Fort William First Nation. This land is the territory of the Anishinabek Nation and is home to the Robinson-Superior Treaty of 1850. Today, Thunder Bay is the home to many Indigenous Peoples from across Turtle Island and we are grateful to have the opportunity to work together in this community and on this territory. We are committed to embedding equity, diversity and inclusion in all the care, education and research that we do. We believe that our differences are key to our growth as an organization and a community, and to our ability to develop innovative approaches to deliver exceptional care to patients, every time.



STRATEGIC PLAN



Exceptional care for every patient, every time.

The Strategic Plan 2026 begins a momentous phase for Thunder Bay Regional Health Sciences Centre (TBRHSC) and Thunder Bay Regional Health Research Institute (TBRHRI). As the inaugural joint strategic plan, it is the foundation on which significant progress in patient care and health research will be made. This plan was built on extensive engagement with patients, families, the public, volunteers, staff and health service providers. Updated Mission, Vision and Values statements reflect the input received, while responses were clear that the organizations' philosophy needs to remain the same: patients at the centre of everything we do. TBRHSC is committed to upholding its position as a leader in Patient and Family Centred Care by introducing the principles of co-design into care planning to ensure care better reflects the needs of the patients and families. Strategic Plan 2026 is an evolution that builds on the successes

of the previous strategic plan, with focused strategic directions identified during stakeholder consultations, including Equity, Diversity, & Inclusion, Patient Experience and Staff Experience. A clear emphasis on Research, Innovation, & Learning will help prioritize and integrate research efforts, build research capacity and create an environment that better supports research, innovation, teaching, and learning. The strategic enabler Sustainable Future is critical to the organizations' financial health and future success, and includes supporting expansion of digital health, creation of a clinical services plan, advancing partnerships and system integration, and achieving operational sustainability. With this new strategic plan, TBRHSC and TBRHRI will strive for continuous improvement, driven by the needs of the patients and families served, and the commitment to exceptional care for every patient, every time.

For a closer look at our Strategic Plan 2026, check out this video:

https://youtu.be/3C_LFcYeBo8



MISSION:

We provide quality care to patients and families, supported and advanced by research, innovation, and education that is responsive to the needs of the population of Northwestern Ontario.

VALUES:

DIVERSITY

We foster a people-centred environment that is inclusive of all.

COMPASSION

We show empathy, compassion and respect by acknowledging ourselves as learners in understanding the experiences of others, and by considering the needs, thoughts and feelings of those we serve and with whom we work.

EXCELLENCE

We deliver the highest quality service in every encounter and in all our work.

INNOVATION

We embrace continual learning and improvement to drive positive change.

ACCOUNTABILITY

We sustain and reinvest in our mission and communities by wisely planning for and managing our resources.

PHILOSOPHY:

Patients at the centre of everything we do.

VISION:



OUR STRATEGIC DIRECTIONS:

Equity, Diversity, & Inclusion

We all belong

Patient Experience

Empathy, compassion, and respect in every encounter

Staff Experience

This is where we want to work, grow, and thrive

Research, Innovation, & Learning

Driven by the needs of our patients, our staff, and our communities

Sustainable Future Ensuring our Healthy Future

Equity, Diversity, & Inclusion

We all belong

Indigenous Self-Identification

The Indigenous Self-identification project is where patients are asked upon point of registration or admission if they would like to voluntarily self-identify as Indigenous. There is also an option to identify to staff in the units, or directly on the website. Self-identification allows patients quicker access to Indigenous Care Coordinators (ICCs), other Indigenous health services within the Hospital, government services, discharge planning, and care within their communities.

The target for Indigenous self-identification that was set for 2026 has already been surpassed, and we plan to expand the scope of the project and adjust the final target. Collecting this information enriches the patient experience, improves health services, and supports future planning for resource needs.



Equity, Diversity and Inclusion Training Anti-racism Strategies

On February 24, 2023, Wake the Giant held a media event to launch their Indigenous Culture and Inclusivity Training to support businesses, companies, and organizations in creating more inclusive spaces, free of racism, and where Indigenous Peoples are welcome. As first to commit to this training, TBRHSC participated in the event, with online training to become mandatory for all staff at TBRHSC as of April 1, 2023. Participants learn to identify racism and engage in

anti-Indigenous racism strategies while exploring Indigenous history, culture, and traditions. The training also includes a wealth of crucial information that help participants to understand the harmful processes of colonization in Canada, including the residential school system, the 60s Scoop, and Indian hospitals. Over 5,900 employees and volunteers from the health care organizations are expected to participate in the training by March 2025.

Building Equity, Diversity and Inclusion Into Everything We Do

To solidify our commitment in moving forward with embedding equity, diversity, and inclusion in everything we do, we created a new position, Vice President, Indigenous Collaboration, Equity & Inclusion that oversees counsel in advocacy and engagement with Indigenous communities, as well as federal and provincial authorities to improve health delivery and equity

outcomes. Additionally, responsible for advancing diversity, inclusion and health equity objectives, by recommending, developing and leading aspects of the equity, diversity and inclusion to provide expertise, resources, strategies and actions to advance equity and inclusion goals across the organization.

WHAT WE WILL DO

Embed Equity, Diversity, and Inclusion in everything we do.

HOW WE WILL DO IT

- Assess policies and procedures, using an equity lens.
- Create an Equity, Diversity, & Inclusion Steering Committee.
- Recruit Indigenous staff.
- Identify opportunities for education and development of Indigenous individuals.

WHAT WE WILL DO

Provide a culturally safe experience for all patients and staff.

HOW WE WILL DO IT

- Provide cultural safety and equity, diversity, and inclusion training for all staff.
- Conduct a walk-through of the Hospital's physical environment with an equity lens.
- Implement the principles of the Truth & Reconciliation Call to Action.

HOW WE WILL MEASURE IT

- Increase staff engagement in cultural safety and equity, diversity, and inclusion training.
- Increase positive patient experience survey results related to their experience, views, and beliefs being acknowledged as part of care.

Equity, Diversity, & Inclusion

We all belong



Cancer Survivorship Campaign

Grand Council Treaty #3 in collaboration with TBRHSC's North West Regional Cancer Program launched the Cancer Survivorship Campaign. This campaign was created to bring awareness to key types of cancer that currently impact Treaty #3 communities and the message that people do survive cancer, especially if it is caught in the early stages.

This collaborative campaign features the stories of three Treaty #3 survivors who share their lived experiences with prostate, colon and breast cancer. The videos focus on the survivors' story while also educating viewers about provincial, organized screening tests for breast and colon cancer.

Project SEARCH

TBRHSC in collaboration with Thunder Bay Catholic District School Board and Community Living Thunder Bay, launched the first Project SEARCH team in Northern Ontario. Project SEARCH is a ten-month unpaid internship program for students with disabilities in their last year of high school. In tandem with classroom learning, students participate in three ten-week internships over the course of the school year to explore a variety of career paths. The ultimate goal of the program is to prepare the students to be a productive and competent employee who can be hired within our community. In total, seven students joined the Hospital for their placement as part of the first-year program.

Developing Culturally Safe Spaces at TBRHSC



TBRHSC marked the National Day of Truth and Reconciliation by taking steps to develop our Hospital as a more culturally inclusive, safe space. A 20-foot tipi was raised, which serves as a safe, cultural space for gatherings, ceremony, teachings and storytelling. The tipi is a part of our commitment to supporting Indigenous peoples when a time of spiritual connectedness or special time with others is needed. We thank our community partners for assisting in the construction and for their guidance. Special thanks also go out to the generous donors in our community who designated their donations directly to the Thunder Bay Regional Health Sciences

Foundation's Family CARE Grant program, which was instrumental in funding the construction.

Additionally, a large mural by Ojibwe artist Ryan Pooman (member of Fort William First Nation) was unveiled. This mural welcomes patients, families, visitors and staff to the cafeteria. The bright, colourful image showcases traditional Indigenous foods from Northern Ontario.

Providing care that honours our patient's identity, background and experiences will improve health outcomes and quality of care, and these events are one step in developing the Hospital as a more culturally inclusive space.

Sioux Lookout and Area FIT Kit Initiative Kits-on-Hand Launch



As of March 20, 2023, fecal immunochemical test (FIT) kits for colon cancer screening were made available at nursing stations and health centres in Sioux Lookout and Area. This change was in response to a request from Indigenous partners and aims to address barriers to FIT access and to increase colorectal cancer screening participation.

This has been a collaborative effort between the Sioux Lookout First Nations Health Authority, Indigenous Services Canada, TBRHSC's North West Regional Cancer Program, LifeLabs, the Ministry of Health and Ontario Health. Partners have been working together to establish new processes and ensure that nursing stations and health centres are supported in their delivery of this new model.

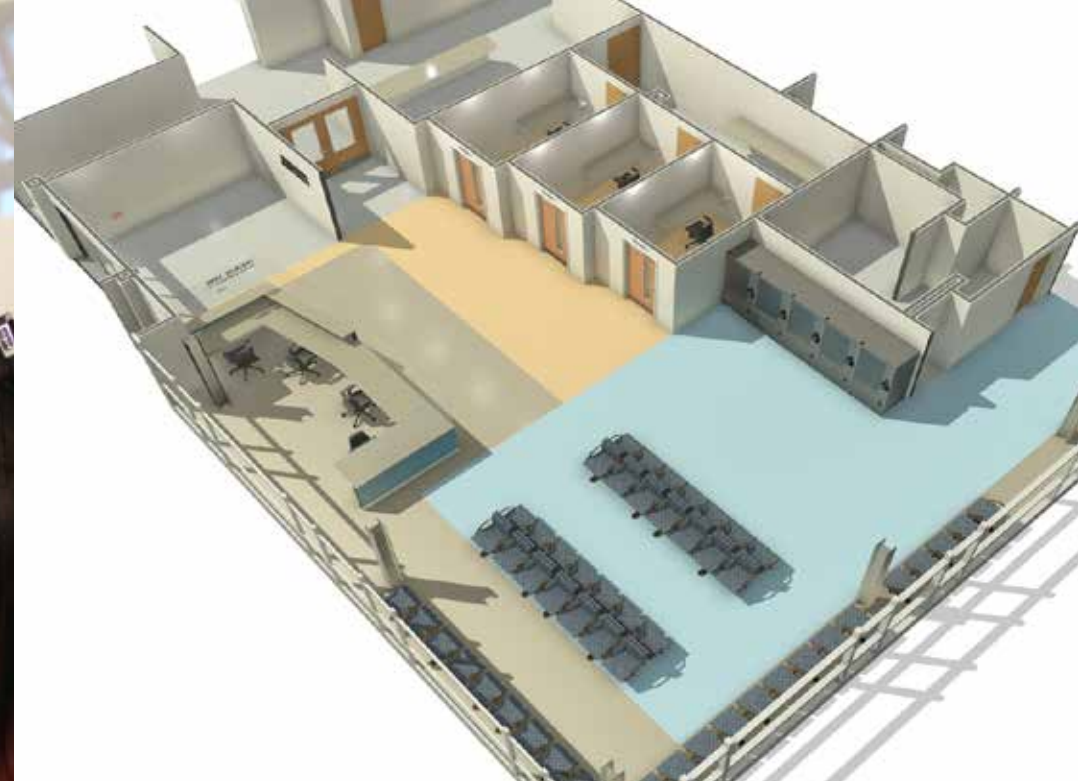
Patient Experience

Empathy, compassion, and respect in every encounter



Co-designed Care Evolution of Patient and Family Centred Care

Our vision at TBRHSC is to provide exceptional care for every patient, every time. In order to achieve this, we are designing and implementing a framework for patient and family co-design of care. This framework will provide us with the methods and tools to receive feedback from patients and families and to improve our services in such a way that really meets their needs, because they have contributed to the design. We have made strong progress in Year 1 with the development of the Co-design Committee, with a robust representation of all levels of staff, professional staff, and Patient Family Advisors. The next step is to design and implement a co-design framework that embraces our principles of patient and family centred care.



Emergency Department Triage Improvement Project

Renovations to the Emergency Department (ED) triage and waiting room area advanced to the functional programming stage this spring. The planned space changes will enhance patient observation, streamline registration and create confidential triage interview stations to improve patient safety and flow. Additionally, updated screening,

security and liaison reception areas will improve patient and family navigation and the overall care experience. Having adequate space will improve the comfort and safety of all patients and provides an area for future expansion for patients coming in to the ED with mental health and addictions needs.



STRATEGIC PLAN

2026

WHAT WE WILL DO

Treat each person with compassion, respect, and empathy.

HOW WE WILL DO IT

- Develop and implement the framework for co-design.
- Embrace patient-centred communication principles.

WHAT WE WILL DO

Focus relentlessly on quality.

HOW WE WILL DO IT

- Develop an annual Quality Improvement Plan.
- Incorporate quality best practices.
- Review a summary of patient safety events.
- Assess current services through the lenses of consistency, coordination, and transitions.

WHAT WE WILL DO

Become experts in caring for patients with complex care needs.

HOW WE WILL DO IT

- Improve coordination, care, and support for patients with complex health issues.
- Develop a Substance Use and Addictions Strategy.

HOW WE WILL MEASURE IT

- Increase positive patient experience survey results.
- Improve quality of care and reduce preventable harm.
- Improve access, care, and support for patients with complex care needs in collaboration with our partners.

Patient Experience

Empathy, compassion, and respect in every encounter



Boost to Cancer Care in Northwestern Ontario

With funding from the Ontario government, Cancer Care Ontario and the Thunder Bay Regional Health Sciences Foundation, people who live in Northwestern Ontario will soon have access to improved cancer care services closer to home.

TBRHSC welcomes the addition of a new, third Linear Accelerator (LINAC) and a new state of the art Positron Emission Tomography (PET/CT) CT scanner that will address gaps in radiation therapy treatment capacity in the region, while keeping up with state of the art technology to accurately diagnose and manage best cancer care. The PET/CT and LINAC are essential components of leading edge cancer diagnosis and treatment. The total project costs come in at just over \$13.2M, and the new PET/CT scanner is anticipated to be operational and in use by August 2023, while the third new Linear Accelerator is expected to be in service for use by December 2023.

Surgical Recovery Strategy Improving Wait Time

Since the start of the pandemic, Ontario hospital surgical wait lists and wait times have increased considerably due to reduced hospital capacity as a result of COVID-19 restrictions. As of December 31, 2022, we have reduced our long-waiting cases by 990, which is much better than the Provincial reduction target of 794 cases. Our efforts have also improved data quality and will contribute to reduced future wait times. To achieve the March 31, 2023 target we needed to reduce long-waiting cases by a further 599 cases and prioritize long-waiting cases if ready for surgery -- or if not ready then adjust cases in the wait time system to reflect this. This extensive work was supported by a Regional Central Intake Coordinator and was well managed through a coordinated effort with our Hospital, surgeons and their office staff. As expected, the efforts improved our overall wait times and our longer term plan is to improve surgical efficiency and to increase our surgical volumes to reflect the ongoing surgical demand.



Cardiovascular Surgery Project

This past year, TBRHSC and Peter Munk Cardiac Centre at the University Health Network continued its incredible partnership working on bringing cardiovascular surgery closer to home for the people of Northwestern Ontario. Stage 2.1 (formerly 3.1), the detailed planning

stage of the capital planning process, was submitted to the Ministry of Health in December 2022. Once approval is received, the team will proceed to stage 2.2 which involves the development of the Sketch Plan Report and costing based on this stage's scope of work. When

complete, this project will result in an approximately 70,000 sq. ft. addition off the existing main entrance at TBRHSC. It will house a comprehensive cardiovascular clinic, a Cardiovascular Surgery Unit, Coronary Care Unit, and a hybrid Operating Room.

Staff Experience

This is where we want to work, grow, and thrive



Workplace Violence Prevention Committee

Like other hospitals, we are experiencing increased and unacceptable patterns of violence and abuse. We have responded by increasing the security and police presence within the Hospital, including the Emergency Department (ED). We have added 13 new security positions and now have a total of 46 full-time equivalent security roles at TBRHSC. We have four security personnel in the ED at all times. We have also collaborated with local police to hire two police officers to have on-site during our busiest times of the day. As well, we are providing additional security during times that our past experiences show the level of violent incidents may be higher. We are continually working to ensure our environment is safe, for our patients and our staff. We will continue to monitor, assess and adapt our model as needed.

Additionally, our Workplace Violence Prevention Committee has been instrumental in improving our Emergency Department and we are building on many of the initiatives to apply to other areas of our Hospital. This team of staff, senior leaders and patient family advisors (PFAs) are involved in other workplace violence prevention initiatives including engagement, education and redesign.

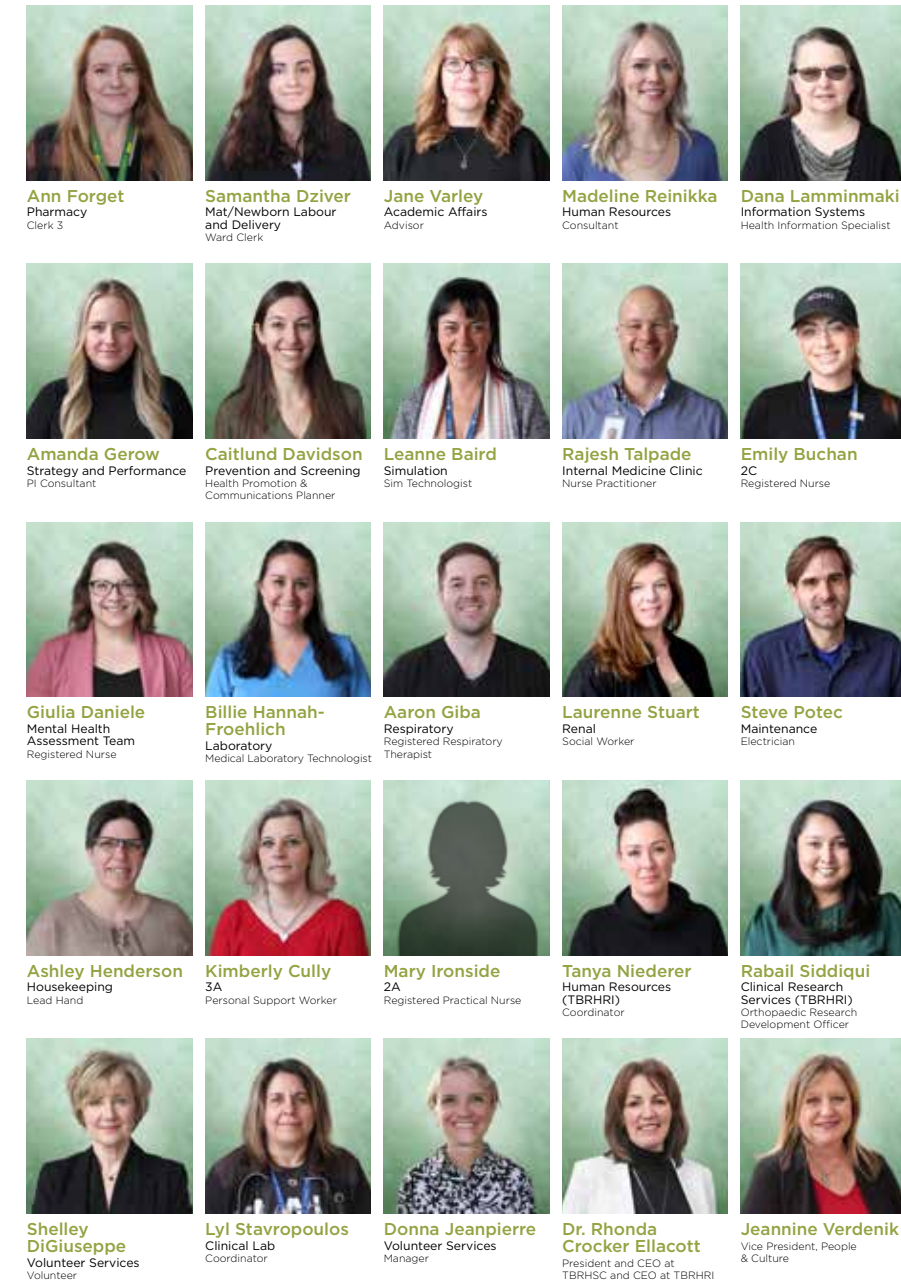
The Workplace Violence Prevention Committee, is a staff-led committee that was initiated to identify solutions to create a safer work environment for our staff and for patients who visit our ED. The primary functions of the committee are to engage with the ED staff to integrate feedback and ideas into workplace violence improvement initiatives, report results and to keep their colleagues informed on progress, execute change initiatives on the front line, and regularly report and provide feedback and ideas to the Workplace Violence Prevention Committee. The Workplace Violence Prevention Committee continues to work on strategies to improve the overall safety of the ED and we will apply many of the practices to our Hospital as a whole.

Staff Advisory Committee

This year, the Staff Advisory Committee was created to support the priorities of Patient Experience and Staff Experience by participating in forums to review and provide feedback on new and existing initiatives to make our organization better. This committee will work to address the features of a healthy workplace: culture, environment, and supportive technology.

The Staff Advisory Committee had their first meeting on February 28, 2023, with members from across

the Hospital and Research Institute. The initial meeting set the stage for the group and we know the cross-representation of members will pave the way for success. We remain steadfast in our goal of making our organizations a place where people want to work, grow and thrive. The committee will reflect the broader thoughts of staff and channels are in place to ensure representation will be all-encompassing. Our efforts align to our Strategic Plan 2026 and this committee will be an important factor in meeting our goals.



STRATEGIC PLAN



WHAT WE WILL DO

Retain, recruit and support the people needed to shape our future.

HOW WE WILL DO IT

- Improve physical and emotional safety, and violence prevention.
- Achieve a safe and just culture that encourages open dialogue.
- Update our current wellness plan.
- Monitor our staff vacancy rates and enhance recruitment processes.
- Implement recruitment processes to reflect Equity, Diversity, & Inclusion.
- Implement an Interprofessional Collaborative Model of Practice.

WHAT WE WILL DO

Support the ongoing development of our current and future leaders.

HOW WE WILL DO IT

- Ensure staff have access to professional development resources and opportunities.
- Implement a leadership development framework.

HOW WE WILL MEASURE IT

- Increase positive staff experience survey results.
- Improve staff engagement.
- Recruit and retain necessary staff.

Staff Experience

This is where we want to work, grow, and thrive



Health Human Resources

Our committed staff are vital to delivering excellent patient care. Through various Ministry program supports and innovative staffing models, we have been successful in recruiting and retaining health human resources to our Hospital. This spring, the Community Commitment Program for Nurses (CCPN) provided us 145 grants to distribute for new nursing hires, some of which were applied retroactively

to nurses hired in 2022. Additionally, we were notified earlier this year that funding for the Enhanced Extern Program is extended to March 31, 2024. This funding allows us to employ Unit Care Aides, who are clinical learners working as unregulated care providers under the direction of regulated providers. More than half of our new nursing hires were employed as Unit Care Aides in 2022. Recruitment of both

of these valuable roles will assist us in stabilizing our staffing needs and allow for more focused clinical care, thereby enhancing the patient experience.

Through changes to staffing models and incentives, we have re-evaluated the way we provide care and services. Innovative staffing changes and incentives bring on big rewards and gains.

For a closer look at our Staff Experience priority, check out this video:

<https://youtu.be/eXXM1PxQUT4>



Research, Innovation, & Learning

Driven by the needs of our patients, our staff, and our communities



Truth & Reconciliation with Dr. Janet Smylie: Emergency Department Assessment

TBRHSC was fortunate to have Dr. Janet Smylie working with a team to review key organizational policies in the Emergency Department (ED) to improve the care experience for Indigenous people.

Dr. Smylie is a respected international leader in the field of Indigenous health. One of Canada's first Métis physicians, her 25-year career focuses on addressing inequities in the health of Indigenous peoples in Canada by bridging gaps in health knowledge and practice. Trained in medicine at Queen's University, the University of Ottawa, and the University of Toronto, Dr. Smylie has practiced and taught family medicine in diverse Indigenous communities - urban, rural and remote.

The review focused on incorporating best practices, embedding cultural considerations and leveraging de-escalation techniques to increase safety in the workplace. As a next step, a Working Group will learn how to create therapeutic alliances and eliminate practices that enable systemic racism or inequities. Topics such as the impact of power dynamics, intergenerational trauma and social determinates of health will be discussed and considered when reviewing current protocols.



FedNor Invests in Medical Technology and Research at TBRHSC

TBRHSC received \$1,228,005 to enhance and expand its Radiopharmacy/Cyclotron technology, which makes radioactive isotopes for medical imaging and research. This funding will enable our Hospital to supply markets outside Thunder Bay with radio-chemicals and isotopes, improving access to diagnostic imaging for patients, and generating revenue streams to assist with sustainability and growth.

In addition, TBRHSC received \$684,110 to renovate and upgrade its medical imaging suite and purchase cutting-edge equipment to expand the research and development capacity. This funding will support both upgrades and additions to Magnetic Resonance Imaging (MRI) equipment, installation of a new spectrometer, commercialization of new technologies and products, and created six new jobs.

Awards

2022 CPA Clinical Section Award for Clinical Excellence.

Led by Dr. Martin Drapeau (Lead Researcher, McGill University) and Dr. Maxine Holmqvist (Lead Clinician, University of Manitoba), Dr. Mushquash contributed to the development of the Best Practices in Psychology Portal.

2023 Canada Gairdner Momentum Award

Dr. Mushquash was recognized for his work in Indigenous-led mental health and substance use research.

Research

A record high of 51 studies were approved in fiscal year 2022 - 2023:

36 Clinical (studies involving patients)

7 Health Systems & Services (research seeking to improve the efficiency and effectiveness of health professionals and the health care system itself through changes to practice and policy)

8 Social, Cultural, Environmental and Population Health (research working to enhance the health of the Canadian population by understanding how social, cultural, environmental, work-related, and economic factors affect people's health)

As of March 31, 2023 there are 166 open studies.

STRATEGIC PLAN

2026

WHAT WE WILL DO

Assess and prioritize our research efforts.

HOW WE WILL DO IT

- Prioritize research and assess current research initiatives.
- Enable opportunities for knowledge translation.

WHAT WE WILL DO

Enhance staff capacity and capability for research success.

HOW WE WILL DO IT

- Recruit researchers to address staffing gaps.
- Retain current staff and mentor new researchers.
- Establish an evaluation framework.

WHAT WE WILL DO

Create an environment supportive of research, innovation, and learning.

HOW WE WILL DO IT

- Encourage staff to lead and participate in research, innovation, and learning.
- Support continuous education and professional development.

HOW WE WILL MEASURE IT

- Increase patients enrolled or involved in research studies.
- Increase number of research publications, grants, and external funding.
- Increase number of learners.

Research, Innovation, & Learning

Driven by the needs of our patients, our staff, and our communities



Research and Clinical Care

Our urology program continues to excel in treatment, training and research. Over the past two years, Dr. Hazem Elmansy co-authored guidance documents for the Canadian Urological Association (CUA) guidelines. The latest guidelines on male lower urinary tract symptoms/benign prostatic hyperplasia and management of ureteral calculi are now available to support urological care services. With the support of colleagues at

TBRHSC and NOSM University, the urology program's vision of world-class care as a leader in surgical management and clinical research for larger-sized prostates has become a reality for us at TBRHSC and for Dr. Elmansy.

One of the largest and most comprehensive cancer studies done locally to date is being conducted on improving cancer treatment pathways in our region. Dr. Walid Shahrour, a reconstructive urologist,

and team are researching cancer treatment and outcomes to identify system gaps and barriers. The goal is to identify where improvements can be made to ensure better access to care for those living in remote rural areas. With our Health Research Institute and urology program we will continue to expand the vision of excellence and providing world class urology treatment.

Dr. Christopher Mushquash Part of Team Nationally Recognized for Contributions to Clinical Psychology



As part of the team awarded the 2022 CPA Clinical Section Award for Clinical Excellence for work developing the Best Practices in Psychology Portal, Dr. Christopher Mushquash was nationally recognized for these contributions.

The Best Practices in Psychology Portal is an online hub for psychologists and trainees in psychology across Canada.

The portal connects research and practice by providing the latest evidence-based resources, information, and tools.

The portal contains videos that allow psychologists and trainees to learn from other clinicians, researchers, and students, and the ability to download tools and measures that can be implemented in clinical practice. Dr. Mushquash contributed to the development of a video resource discussing considerations for when applying evidence-based psychological practice with Indigenous people.

"It was an honour to be a part of the development of the Best Practices in

Psychology Portal, and for the work to be awarded by the CPA," said Dr. Mushquash. "This online resource for psychologists and trainees allows them to view examples and considerations for incorporating the most up-to-date, evidence-based practice and clinical tools into clinical work, so that they in turn can provide the best possible care to their patients."

"Dr. Mushquash is a true champion for culturally and contextually appropriate mental health and addiction services for First Nations peoples, and for individuals living in rural and northern communities," said Dr. Rhonda Crocker Ellacott, President and CEO of TBRHSC and CEO of TBRHRI. "Congratulations to him and the team for all their incredible work."

"Congratulations to Dr. Mushquash and his team for being recognized as this year's winner of the CPA Clinical Section Award for Clinical Excellence," said Dr. Andrew P. Dean, Lakehead University's Vice-President, Research and Innovation.

"The development of the portal for clinical psychologists is unique and very forward thinking. Providing tools and resources through this method will allow for appropriate and current resources for practicing psychologists. The team and Dr. Mushquash truly are worthy recipients for this important award," added Dr. Dean.

You can find out more about Dr. Mushquash's work at <https://www.christophermushquash.com/>. To learn more about the Best Practices in Psychology portal, visit <https://www.mcgill.ca/psy/>.

The CPA is a national association for the science, practice and education of psychology in Canada. This not-for profit organization is Canada's largest professional association for psychology and has more than 7,000 members and affiliates. Each year, the CPA honours clinical psychologists who advance the understanding and amelioration of suffering and the promotion of psychological wellness with the Clinical Section Award for Clinical Excellence.

ROMEIO Research Portal

TBRHSC and TBRHRI have transitioned to the ROMEIO Research Portal. This electronic research administration and application system manages clinical research needs including reviews, approvals, tracking, and reporting.

The system streamlines the ethics and institutional authorization

process for research by reducing administrative data entry, tracking deliverables and auto-reminders for re-approvals.

While the application itself will feel similar, researchers are now able to complete a single, combined application for both ethics and institutional approvals. The goal is

to reduce overall review times and continue to enhance the quality and clarity of our applications and forms. This system has allowed for quicker turn around times from all parties, meaning studies can open faster and in turn, more opportunities for patients.

Sustainable Future

Ensuring our Healthy Future



Regional Paediatrics, Regional Neonatal Patient Transport

TBRHSC has received funding to establish a dedicated Infant and Neonatal Transport Team. Once established, this specialized team will be available 24 hours a day, 365 days a year to deliver timely transport services across the North to acutely ill neonatal and paediatric patients up to age one. The dedicated team will work in partnership with ORNGE and the other provincial neonatal and paediatric transport teams to ensure these patients within our region have their clinical needs addressed more quickly.

Transport medicine is a new and exciting endeavour for TBRHSC, particularly for this patient population. Use of specialized transport equipment is required along with a significant amount of clinical training and skills building, and extensive aeromedical training will start in September. Once developed, the team will be responsible for assisting our small and rural regional partners in the stabilization of acutely ill infants, as well as the delivery of high-quality care throughout the entirety of the transport. These patients will be transported to a higher level of care, including TBRHSC or other tertiary centres as appropriate. This team will also support transportation from TBRHSC to tertiary hospitals as well as can assist with patient repatriation.

Currently patients often face lengthy transfer times, which often exceed the provincial benchmark. The addition of the TBRHSC Infant and Neonatal Transport Team will ensure paediatric patients within our region have access to quality care in a timely manner and will have a very positive impact on infant health across the north, particularly those in remote communities. The team is planning to be ready to transport their first patient in the spring of 2024.



Ontario Health Teams and Partnerships

The City and District of Thunder Bay Ontario Health Team (OHT) has made significant progress over the past year, including the establishment of OHT governance and leadership which includes the formation of a consensus based Collaboration Council with Indigenous and non-Indigenous Co-leadership. As well, establishment of the People-Centred Advisory Council (PCAC), to empower and embed the voice of patients, clients, residents, families and caregivers into the system planning and co-design of the OHT. Through development of a Collaborative Quality Improvement Plan (cQIP), the OHT worked closely with the Thunder Bay Regional Health Sciences Centre Prevention and Screening Program to identify action plans related to the required cancer screening metrics. As a long-term vision, from a digital perspective, the OHT developed a Harmonized Information Management Plan which outlines a plan for data governance and data stewardship, so the OHT can meet the goals of integrated care while protecting privacy where further engagement with Primary Care providers will be done to review their needs and together find opportunities to move the business case forward.

STRATEGIC PLAN



WHAT WE WILL DO

Advance digital health to improve patient and staff experiences.

HOW WE WILL DO IT

- Secure and implement the electronic health record.
- Determine required data systems.
- Implement a plan to meet information needs.

WHAT WE WILL DO

Develop a Hospital Clinical Services Plan to clarify our acute care and academic mandates.

HOW WE WILL DO IT

- Determine which current services are consistent with our mandates.
- Estimate our short and long-term service demand.

WHAT WE WILL DO

Advance Partnerships and System Integration.

HOW WE WILL DO IT

- Advance existing regional partnerships and programs.
- Pursue strategic partnership and integration opportunities.
- Be a voice and advocate for the needs of our entire region.

WHAT WE WILL DO

Achieve Operational Sustainability and Accountability.

HOW WE WILL DO IT

- Create an accountability framework.
- Provide training and supports to improve accountability.

HOW WE WILL MEASURE IT

- Prioritize our services and find operational efficiencies.
- Increase partnerships to improve and integrate care for patients.

Sustainable Future

Ensuring our Healthy Future



Blood on Board Program

TBRHSC and ORNGE announced Northern Ontario's first 'Blood on Board' program. ORNGE paramedics will have the ability to transport blood products from base directly to the scene of a traumatic injury by air and administering them to a patient. Hemorrhage is a leading cause of death in traumatically injured patients, and research shows that early blood

transfusion can improve patient outcomes. A timely transfusion is particularly important for patients who face long transport times to definitive care.

The collaboration between TBRHSC and ORNGE launched in April 2023. The blood bank at TBRHSC will supply ORNGE with blood products in specialized coolers designed for

the storage and transport of blood. Blood temperatures are monitored carefully during storage and on board the aircraft up to the time of transfusion, ensuring the highest safety standards are met.

This program is one of a number of initiatives aimed at improving health equity in Northern Ontario communities.

Surgical Remote Patient Monitoring A Game-Changer in Patient Care

The impact the pandemic has had on reshaping health care is undeniable. With expanding the use of digital platforms and health technologies, innovation has improved the health care experience for both patients and providers. One example is the Surgical Remote Patient Monitoring (RPM) team at Thunder Bay Regional Health Sciences Centre (TBRHSC), who is using a web-based platform to offer pre- and post-operative health care to patients from wherever they connect to the internet.

As Caroline Fanti, Director of Regional Surgical Services explains, "We introduced Surgical RPM in November 2020 as a means to enhance TBRHSC's pandemic response. Our team utilizes a digital tool [SeamlessMD] to engage and monitor surgical patients across Northwestern Ontario."

Initiating the program during the height of the pandemic was a means to protect patients and manage limited hospital resources, shares Dr. David Puskas, Medical Director of Musculoskeletal Health and Senior Orthopaedic Surgeon at TBRHSC.

"Hospitals are great places when they are necessary, but also, quite frankly, patients can experience a heightened risk of infection while they are admitted. With the challenges of flu seasons, COVID-19 and admission restrictions, Caroline Fanti and I looked for a solution where we can provide the kind of surveillance that patients require, that connection with their care team, and not have patients expose themselves to the risk of hospitalization."

The digital tool has personalized information for preparing for surgery through recovery with a digital library, daily tracking and remote monitoring. Dr. Puskas says the response from his patients has been overwhelmingly positive.

"Our pilot study showed patient satisfaction was far higher than it was before we started to reduce length of stay," states Dr. Puskas. "We are using technology in a way that gives patients confidence and control over their own health care. And also facilitates staying out of the hospital, which is good for everybody."

For Dr. Travis Marion, Orthopaedic Surgeon and Medical Lead for Spinal Surgery, surgical RPM has been a game-changer.

"It has empowered my patients by providing them with a significant amount of knowledge at their fingertips, daily questionnaires, exercises and information patients may want to have perioperatively," says Dr. Marion. "They come in better informed and prepared for their procedure and the course of their care."

The key to the success of Surgical RPM is that it is a shared model of care. The team has a continuum of providers including the clerical staff who aid with the institution of SeamlessMD, the nurse practitioners (NPs) who answer daily queries and the surgeon, who is available as required.

Nurse practitioners Kayley Heppler and Stephanie Tempelman explain they act as a patient advocate and liaison for thirty days post-op.

"As NPs, we are able operate

autonomously in our role," remarks Heppler. "We perform comprehensive assessments, diagnose, order and interpret diagnostics, prescribe pharmacological and therapeutic interventions and refer to interdisciplinary team members. We rule out complications and work closely with surgeons to meet patient needs."

"We use SeamlessMD on a daily basis to support patients with internet access in Thunder Bay and across Northwestern Ontario" adds Tempelman. "We monitor concerns that are reported by the patient and it helps us to connect with them to support them. For example, with wound care, if patients are concerned about bruising, redness or swelling, they can submit photos for us to review. The ability to video chat and connect with people in their homes is a huge asset of this program."

The Surgical RPM team at TBRHSC now supports certain orthopedic, bariatric, gynecological, urological, spine, colorectal and breast surgeries while using technology to narrow the distance between provider and the patient.

"And the faster we can get patients out of the hospital, the more rapidly they will recover the function and the ability to be in their home environment," summarizes Dr. Puskas. "Remote patient monitoring is a crucial part of bridging that gap. They have the best of both worlds – they are out of the hospital and they have contact with their surgical team, at all levels of that team.

"It's the future and it's a bright one."



Overall – Status Report

We have successfully launched and made progress on 13 of 26 strategic initiatives in Year 1, across all of our Strategic Directions.

Equity, Diversity & Inclusion On Track
2 initiatives underway

Patient Experience On Track
4 initiatives underway

Staff Experience On Track
3 initiatives underway

Research, Innovation & Learning On Track
1 initiative underway

Sustainable Future On Track
3 initiatives underway

At or better than target

Slightly below target

Considerably below target

Strategic Indicators

A total of 10 strategic indicators were developed and approved by the TBRHSC and TBRHRI Boards to measure overall progress on SP2026. In Year 1, four of those indicators were launched, with progress reported below.

■ Increased number of patients who **self-identify as Indigenous**; have already exceeded 2026 target.

■ Exceeding targets for improving **quality of care and reducing preventable harm**.

■ Increased partnerships to improve and integrate care for patients. Exceeding targets for the **proportion of patients aligned with regional programs/services**.

■ Ongoing financial challenges. **Percent operating gross margin remains worse than target**.

NOTE: Additional indicators are in development, with measurement and reporting methodologies being investigated. Expected to launch and report in Year 2.

Our Plan Forward: Years 2 – 5

Based on our Annual Review cycle, we have made some minor refinements to project timelines and scope. We are excited to launch our upcoming strategic initiatives.

Strategic Directions / Enablers & Projects

	2022/3				2023/4				2024/5				2025/6				2026/27		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Equity, Diversity & Inclusion																			
EDI Steering Committee Development																			
Truth & Reconciliation Call to Action Principles																			
EDI Policy & Procedure Review & Adjustment																			
Cultural Safety Training for Staff																			
EDI Physical Environment Review																			
EDI Experience Sharing to Build Understanding & Respect																			
Indigenous Recruitment, Education Support & Related Strategies																			
Patient Experience																			
Seamless Transitions - Assess & Improve																			
Implement Substance Use and Addictions Strategies																			
Evolve Patient & Family Centred Care Using Co-Design																			
Focus on Quality																			
Support Improved Coordination & Support for Frequent Users																			
Staff Experience																			
Staffing, Vacancy Reporting & Recruitment																			
Enhance Leadership Development																			
Value Based Recruitment																			
Implement Healthy Workplace Strategies																			
Organizational Workplace Violence Prevention																			
Design & Implement Interprofessional Collaborative Model of Practice																			
Implement Strategies to Support a Safe & Just Culture																			
Research, Innovation & Learning																			
Research Prioritization & Operationalization																			
Researcher Staffing & Recruitment																			
Establish a Culture to Support Learning & Professional Development																			
Sustainable Future																			
Digital Health - Shared Vision, Electronic Health Record, and Ongoing Development																			
Build and Enhance Regional Partnerships																			
Develop Clinical Services Plan to Project Future Service Demand and Required Capacities																			
Develop Framework and Strategies to Support Sustainability & Accountability																			

Ensuring Accountability, Alignment and Focus

At the initiation of SP2026, we implemented an annual review cycle to ensure that we regularly seek and consider data and feedback to guide our plan. Near the end of Year 1 of SP2026 we conducted stakeholder engagements and an annual scan of the environment to ensure our plan is still relevant and focused as we proceed on our SP2026 path. The annual review resulted in the following findings and recommended refinements:

- Directions and initiatives remain relevant – no directional changes made
- Prioritization and focus is key – made refinements to project timelines and scope (enhanced focus on staff

experience and EDI; refined our scope for Clinical Services Plan); implemented internal prioritization processes to remain focused

- Communication and engagement – internal and external communications plan being enhanced
- The joint TBRHSC and TBRHRI plan shows value to advancing collective goals

Robust feedback was provided by stakeholders and partners related to partnership opportunities/enhancements, community and regional needs, communication and engagement, etc. All feedback has been noted and is being considered by Project Teams for ongoing implementation.

Our Cascading and Monitoring Plan

Senior Leadership

1. Monthly progress reports and monitoring
2. Quarterly deep-dive sessions

Management and Staff

1. Weekly Strategic Alignment meetings
2. Director and manager-led discussions and monitoring with teams
3. Quarterly performance debriefs + Town Halls

Board

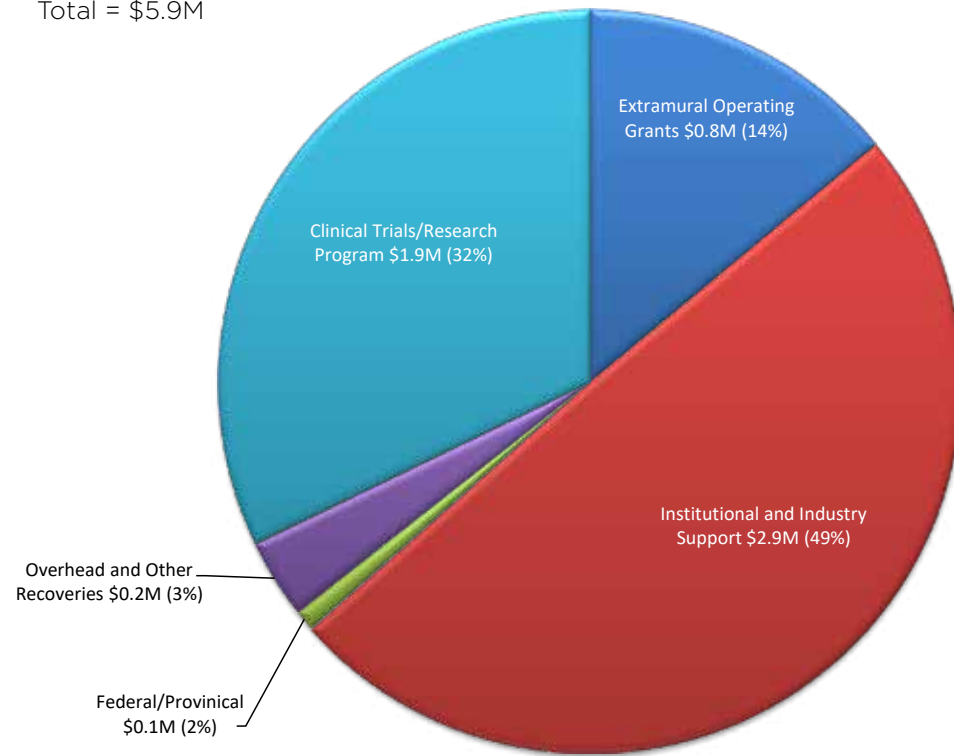
1. Quarterly reporting
2. Annual environmental scan and refinements

Annual Community Partner Session

2022-2023 Financials

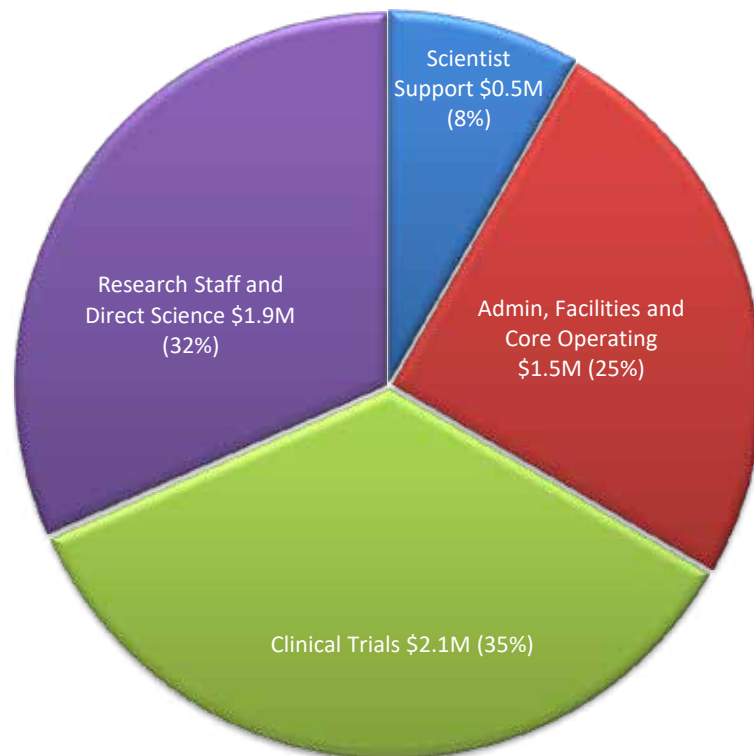
REVENUE SOURCES

Total = \$5.9M



EXPENSES

Total = \$6M



Funders and Partners

GOVERNMENT:



ABORIGINAL HEALTH ACCESS CENTRES (AHACS):



ACADEMICS:



NOT FOR PROFIT:



INDUSTRY:





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