healthy together

2011 - 2012
Report to the Community
and a Year in Review

Health Sciences
Centre Achieves
"Gold Standard" of 24/7 Angioplasty Care

Teleophthalmology
Bringing Portable Eye Exams
to Diabetics in the Region

P.A.R.T.Y. Program
Preventing Risk-Related
Trauma in Youth

THUNDER BAY
Regional
Health
SCIENCES CENTRE

Contents

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Responses to this report are encouraged. Please address your comments to the Senior Director of Communications and Engagement.

Cover Photo: Tina Caccamo, RN, Cardiac Catheterization Lab

THUNDER BAY Regional Health SCIENCES CENTRE

OUR VISION

healthy together

OUR MISSION

To advance world-class Patient and Family Centred Care in an academic, research-based, acute care environment.

VALUES

Patients First

Accountability

Respect

Excellence

Report from the Co-Chair, Patient Family Advisory Council

I was surprised to realize it has been over 2 years since a friend called me who works at the Thunder Bay Regional Health Sciences Centre (TBRHSC). She asked if I would become a volunteer Patient Family Advisor (PFA). She explained that exciting changes were coming in the way patients and their families would be integrated as partners in running our Health Sciences Centre: Patient and Family Centred Care (PFCC). I was intrigued and needed to know more. Since then there have been 86 PFAs involved in over 200 working groups and committees at TBRHSC.

I learned that the most recent patient survey (NRC Picker) results showed that we went from below the Ontario Teaching Hospital average to constantly exceeding it in patient satisfaction. This evokes a sense of pride for our Health Sciences Centre, and we, as PFAs, played an important role in this achievement. The true icing on the cake came in late 2011, when Accreditation Canada came for a site visit. We had many PFAs involved in the process and passed our Accreditation with flying colours. We were awarded leading practice for "Patient and Family Centred Care". We are the first and best in the entire country at engaging our patients.

I hope I can speak for patients in saying thank you. First, thank you to the Board of Directors for seeing the future and taking a big step towards this huge and innovative change. Thank you to Senior Management for taking on the challenge to change the culture and for doing so with honest conviction. We know change, even positive change, is no easy task. Thank you especially to the staff, clinical and non-clinical, for embracing the PFCC model of care. The positive outcomes brought TBRHSC to a new level of excellence. TBRHSC is a great facility, modern and full of equipment to keep us healthy. However, if we measure our success based on our staff, our philosophy and our model of care, I see a proverbial giant in healthcare.

What a wonderful philosophy Patient and Family Centred Care (PFCC) is. Patients feel they belong and are a valued part of the overall healthcare experience. I hope we continue to put Patients and their Families at the centre of everything we do.

Keith Taylor

Co-Chair, Patient Family Advisory Council

DEFINITION

Patient and Family Centred Care

The provision of care that is respectful of, and responsive to, individual patient/family preferences, needs and values, and ensures that patient values guide all clinical decisions.

Adapted from the Institute Of Medicine

Patient and Family Centred Care is:

- a change from serving patients to partnering with patients
- working with patients and families, rather than doing things to or for them
- a change in organizational culture, in how we define our work, and how we practice together

The Patient and Family Centred Care model is designed to have Patient Family Advisors (volunteers) involved in all decisions from Food Services to management hiring committees, and more. The philosophy is designed to make patients and their families partners, not only in care, but in day to day operations. After all, patients are experts about themselves and make the best decisions regarding their care.

RESULTS OF PFCC

Before the introduction of PFCC TBRHSC was somewhere in the middle grouping in overall patient satisfaction (approximately 13 hospitals). The direct relationship built with Patient and Families through the PFCC model helped raise scores that are setting a new bar in patient satisfaction.

Click to view video

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Thank you for contributions made by Board Members whose terms completed in 2011-2012:

Dr. William Hettenhausen

Ron Nelson

Stella Rose Osawamick-Hogan

Report from the Chair of the Board of Directors

Our Strategic Plan is well supported. I marvel at the level of dedication constantly demonstrated by our healthcare professionals, staff, volunteers, and donors who work together to do so much more than meet the needs of patients and families. The results of their willingness to go the extra mile are evidenced in patient satisfaction surveys. We were honoured when Accreditation Canada commended our Health Sciences Centre, designating our Patient and Family Centred Care (PFCC) model of care as a Leading Practice in Canada. This distinction confirms what our patients and families have reported.

We were also commended by Accreditation Canada for our leadership in Family Visitation using Telemedicine. In addition, TBRHSC was ranked one of the Top 40 Research Hospitals in Canada by Research Infosource. We are evolving into an Academic Health Sciences Centre.

None of these considerable accomplishments could have been possible without the outstanding support and involvement of our partners. We are leaders in healthcare delivery because we are backed by so many who care about our ability to succeed. Our community is our motivator.

The past year has been one of tremendous change, and a source of great pride for the many people involved. I commend them for setting us on this path. We continue to face challenges on a daily basis; Gridlock occurs as we struggle to provide for the needs of Alternate Level of Care (ALC) patients and acute care patients, and we are faced with difficult financial decisions. However, our focus is on finding solutions with our community partners, so that we may provide the right care at the right place at the right time.

As my term as a Board member and Chair of the Board of Directors comes to a close, I wish to thank my fellow Board members and the Health Sciences Centre team for their support and commitment. I know our Thunder Bay Regional Health Sciences Centre is on a clear path to success. With such capable leaders backed by enthusiastic partners and a dedicated community, healthcare in Northwestern Ontario has the brightest of futures.

Angèle Brunelle

Angèle Brunelle

Chair of the Board,
Thunder Bay Regional Health Sciences Centre

Report from the President & CEO

Through engagement with our community, we learned valuable lessons to apply to our Strategic Plan. We learned that age, ethnicity, background, and personal history are our best assets for comprehensive strategic planning. Together, our multiple perspectives help us to see the whole picture with more clarity, enabling us to understand our present and visualize our future.

Throughout our strategic planning process, we welcomed new perspectives, and now we are realizing the benefits. It is an exciting time in healthcare in Northwestern Ontario.

We are fulfilling our Academic and Research mandates in alignment with our Clinical Services. Adopting a Program Management model allowed us to design healthcare around the needs of our patients and strengthened accountability and transparency. Co-leading with our physicians, patients, and families facilitates a proactive focus on our Strategic Directions.

This annual report is a celebration of the journey of Patient Family Centred Care and our organization's transformation into an Academic Health Sciences Centre. As you read through it, I believe you will be as proud as I am. You will learn of significant accomplishments from each of our four Strategic Directions: Comprehensive Clinical Care, Addiction and Mental Health, Aboriginal Health, and Chronic Disease. Each success is rooted in our commitment to Patient and Family Centred Care (PFCC). For example, we expanded our capacity to help our patients live healthier lives with the opening of the Centre for Complex Diabetes Care.

You will also see highlights from our Quality Improvement Plan and Performance Scorecard. These tools drive change through focused improvement targets and support our commitment to outcomes and accountability to the people of Northwestern Ontario.

Our Thunder Bay Regional Health Sciences Centre belongs to you as a member of our community. I encourage you to embrace the activities that shape your care. We continue to seek input and new ways of conducting the business of healthcare. We saw the possibility this year as we moved toward our new future, and we will continue to realize meaningful successes. We are becoming Healthy Together.

A Robichaud

Andrée G. Robichaud

President and CEO,
Thunder Bay Regional Health Sciences Centre

SENIOR MANAGEMENT TEAM

Andrée G. Robichaud
President and CEO

Dr. George Derbyshire
Chief of Staff

Dr. Rhonda Crocker Ellacott
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Lori Marshall
Executive Vice President, Strategy, Performance and Aboriginal Health

Dr. Gordon Porter
Executive Vice President, Medical & Academic Affairs

Scott Potts
Executive Vice President, Corporate and Diagnostic Services

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Senior Director, Communications & Engagement

Glenn Craig
CEO, Thunder Bay Regional Health Sciences Foundation

Don Halpert
Executive in Residence

Janet Northan
Director, Government Relations

Senior Management Team members who retired in 2011-2012:

Don Edwards

2011 AWARDS

Leading Practice

Patient and Family Centred Care
Accreditation Canada

Leading Practice

Telemedicine
Accreditation Canada

Innovation Award

Cancer Quality Council of Ontario
Cancer Centre research (Ingeborg Zehbe)

Top 40 Research Hospitals in Canada
RE$EARCH Infosource Inc.

Winner National Hand Hygiene Video competition
Canadian Patient Safety Institute

Click to view video

Innovation Award: CNA Certification
The Canadian Nurses Association

2011 - 2012 by the numbers

103,019 Inquiries to the information desk

1,267 Babies Born

95.1% Patient Satisfaction

7,620,653 Lab Tests

209,651 Diagnostic Imaging Exams

1,461,931kgs of Laundry washed

55,013 Physiotherapy Visits

109,179 Emergency Department Visits

3000kgs Bananas Consumed

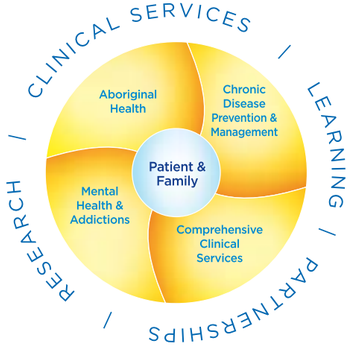
2009: 273
2012: 468
Compliments

85% Surgeries Completed within target timelines

Hand Hygiene compliance rates up **24%** from 2011

Strategic Plan 2015

Click to view video



Alignment of Programs and Services

Through measured examination of the health status of the residents of Northwestern Ontario and with broad partner engagement, Thunder Bay Regional Health Sciences Centre developed the Strategic Plan 2015 to lead us to our Vision: Healthy Together.

To achieve this Vision, we will need to focus on the health needs of the population that we serve, and to provide services in new and innovative ways. With the patient and family at the centre of everything we do, efforts will be focused on Aboriginal Health, Chronic Disease Prevention and Management, Comprehensive Clinical Services and Mental Health and Addictions. As an Academic Health Sciences Centre, providing leading-edge patient care comes from the integration of excellent Clinical Services, Learning and Research.

"We need to change as the needs of our population changes."

Nella Lawrence, Manager Program Planning & Telecommunications, TBRHSC

Health Status

Population Characteristic Highlights

- Census data shows that the North West region has 230,000 individuals which accounts for 2% of the province's population.
- 53% live in the City of Thunder Bay; 27% Kenora District; 11% Thunder Bay District (excluding Thunder Bay); 9% Rainy River District.
- NWLHIN is home to a third of the on-reserve Aboriginal population, a quarter of the off-reserve and just over half of all "Indian Reserves and Indian Settlements" in the province. Aboriginal people are estimated to represent 19.2% of the population in the NWLHIN.

Population Health Status in the Northwest LHIN compared with the Province of Ontario

- Significantly lower percentage of residents perceive their health as excellent or very good.
- Residents have the highest rate of diabetes mortality of all 14 LHINs.
- Residents have significantly higher mortality rates for all circulatory system disease such as heart disease or stroke.
- Life expectancy is the lowest in the province.
- Mortality rates due to all external causes, and suicide specifically, are significantly higher.
- Higher rates for most chronic conditions including arthritis, high blood pressure, other heart disease, asthma and diabetes.

North West Population Health Practices

Significantly Higher Rates of:

- Smoking
- Second Hand Smoke
- Heavy Alcohol Consumption
- Obesity
- Student Substance Use

Significantly Lower Rates of:

- Fruit and vegetable consumption
- Access to a regular medical doctor
- Contact with medical doctor in the past 12 months
- Influenza immunization
- Student physical activity

We have bad habits that contribute to us being sicker than the rest of the Province.

CLINICAL SERVICES

CLINICAL PROGRAMS

- Cardiovascular and Stroke Program
- Chronic Disease Prevention and Management Program
- Mental Health Program
- Regional Cancer Program
- Trauma Program
- Women and Children's Program

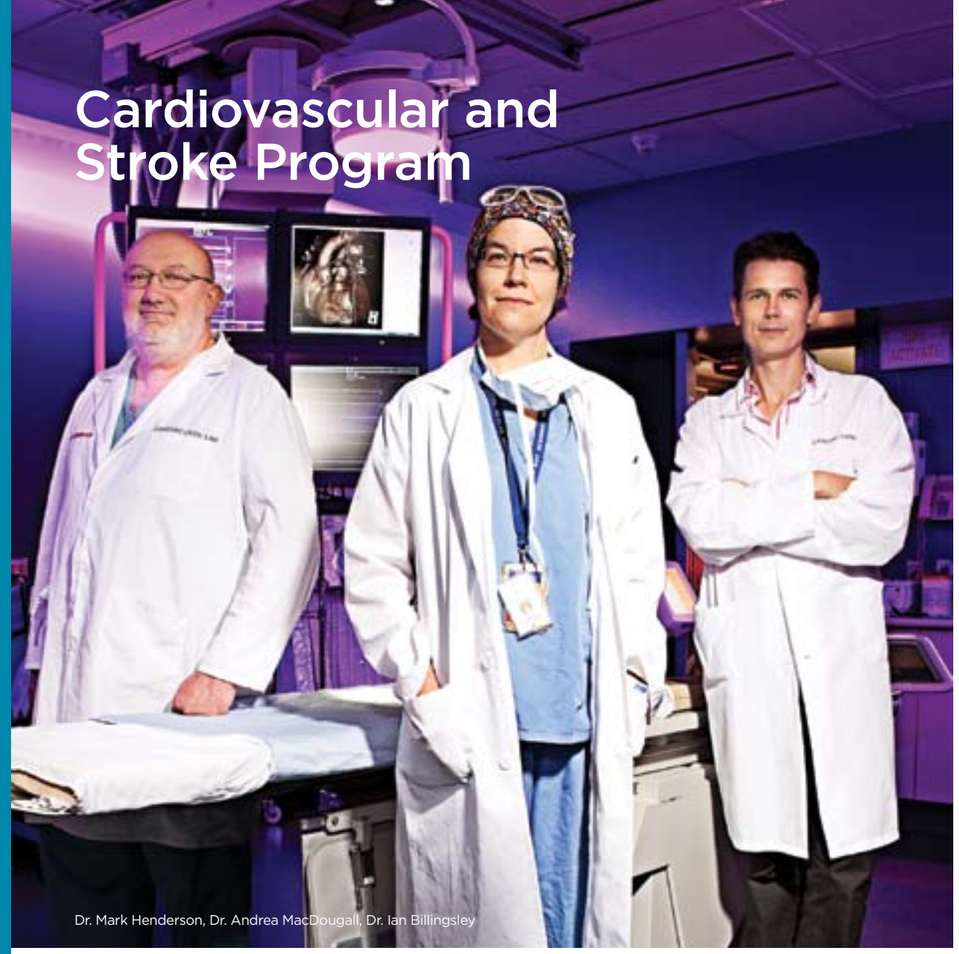
Patient and Family Centred Care
Research and Academics

DEFINITION

The Cardiovascular and Stroke Program leads the delivery, development and implementation of services to prevent, screen, diagnose, treat and rehabilitate patients with a broad spectrum of vascular diseases. Specialty areas include:

- Cardiac care, including the development of Cardiac Surgical and Advanced Rhythm Management programs
- Stroke and Neurology care, including the development of a Neuro-Interventional Program
- Vascular care, including the development of vascular surgical and interventional programs
- Renal vascular access support
- Ensuring safe, effective transport medicine care, in collaboration with EMS providers

Cardiovascular and Stroke Program



Dr. Mark Henderson, Dr. Andrea MacDougall, Dr. Ian Billingsley

Second Cath Lab Means Gold Standard of 24/7 Angioplasty Services

The Angioplasty Program at the Thunder Bay Regional Health Sciences Centre reached a major milestone with the opening of a second Catheterization (Cath) Lab four years after the program first started. With the new Cath Lab officially opened on August 10, 2011, the Angioplasty Program can now offer 24/7 emergency angioplasty services, the Gold Standard for the treatment of heart attacks.

With two suites being utilized, the waiting time for patients to receive an angioplasty is much shorter. We are now far more capable of handling the emergency cases.

The second Cardiac Catheterization Lab was named 'The J. Armand Bombardier Foundation Cardiac Catheterization Lab' in honour of Bombardier's $500,000 contribution towards the project.

James Forbes, who himself had life-saving angioplasty at the Health Sciences Centre, knows first hand how important it is to have angioplasty services here in Thunder Bay rather than having to be sent to Ottawa, Hamilton, or elsewhere.

"I have heard about people's lives being changed 'in a heartbeat', but I didn't think that I would ever be part of the story," Forbes said. "However, here I am, talking to you. How can words express my gratitude? How can my family say thank you? Having the doctors and the teams of healthcare workers so close at my time of need was tremendously comforting. They literally saved my life. It is priceless."

The Angioplasty Program also welcomed its third Interventional Cardiologist in 2011, Dr. Andrea MacDougall, who joined Dr. Mark Henderson and Dr. Ian Billingsley.

Stroke Video Teaches Aboriginal Youth to "Act Fast"

When it comes to stroke, "time is brain". That's especially true in remote areas like First Nation communities where getting stroke patients to a hospital can take longer.

The Northwestern Ontario Regional Stroke Network launched a new video, "Act Fast: 1-2-3!", in March 2012. It was made for and by Aboriginal youth in nine First Nation communities and Thunder Bay. The goal was to help teach young people, 10-13 years old, living in these communities how to recognize the signs of stroke and what to do.

"They told us what they knew about stroke, and how they wanted to learn more about stroke," said Pauline Bodnar, a Community & Long Term Care Specialist at the NWO Regional Stroke Network and the project's co-ordinator.

Dr. Mary Ellen Hill, a Senior Researcher at the Centre for Rural and Northern Health Research, said that the key to the video's success is the fact that they worked so hard on getting the research right.

"I really feel that this video is important, that it will be taken into the communities, and years down the road there will be people who be learning from it," Dr. Hill said.

Foundation Support

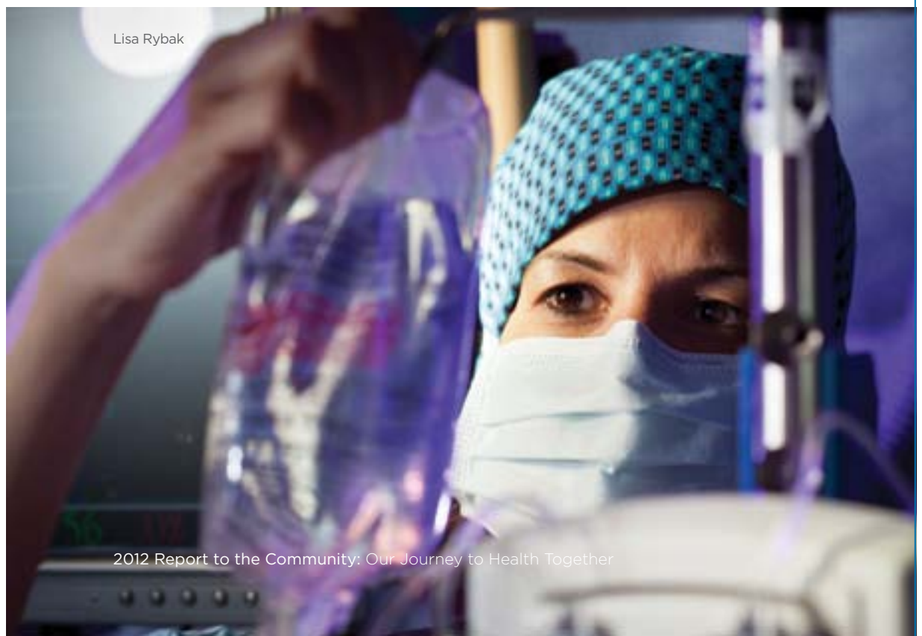
The Thunder Bay Regional Health Sciences Foundation has been critical for the development of the Angioplasty Program, helping achieve 24/7 emergency angioplasty capabilities. "Some believed Angioplasty would never be available here in Northwestern Ontario. Others made sure it was," said Glenn Craig, President & CEO of the Thunder Bay Regional Health Sciences Foundation. The Foundation has contributed approximately $5 million for cardiac care, including for the Angioplasty Program and both Cardiac Catheterization Labs.

Meet Scientist Dr. Lily Wu

Investigating modern diseases

Our modern diet is causing modern diseases. Dr. Lily Wu and her team are investigating the workings of metabolic syndrome – a combination of disorders including hypertension, diabetes, and obesity – and then finding ways to treat and prevent it.

Click to read more



Lisa Rybak

ACCOMPLISHMENTS

Launched 24/7 access to emergency angioplasty for treatment of heart attacks

Successfully partnered with Emergency Medical Services to ensure rapid transport protocols

Recruited third Interventional Cardiologist, Dr. Andrea McDougall

Led the submission of the Health Sciences Centre's Comprehensive Cardiovascular Surgical Proposal

Received Fort Frances as a partner site for cardiac rehabilitation; exercise therapists program-wide achieved American College of Sports Medicine (ACSM) Specialty Certification.

Produced the "Act FAST, 1-2-3!" DVD and created a stroke care tool kit for care providers in First Nation communities

CHALLENGES

Limited vascular capacity in Ontario and Manitoba to support Northwestern Ontario

Congestive heart failure (CHF) lengths of stay and re-admissions too high

Growing cluster of high-risk patients with infective endocarditis and addiction issues

FOCUS

Reduce death/disability due to vascular diseases

Support healthy lifestyles; our Exercise Rehabilitation Program will become a hub for health promotion

Provide our patients with information to self-manage their diseases

Become a full-service tertiary centre offering cardiac and vascular surgery, Advanced Rhythm Management, and interventional neuro and vascular care

GOALS

Create a comprehensive congestive heart failure pathway to guide care

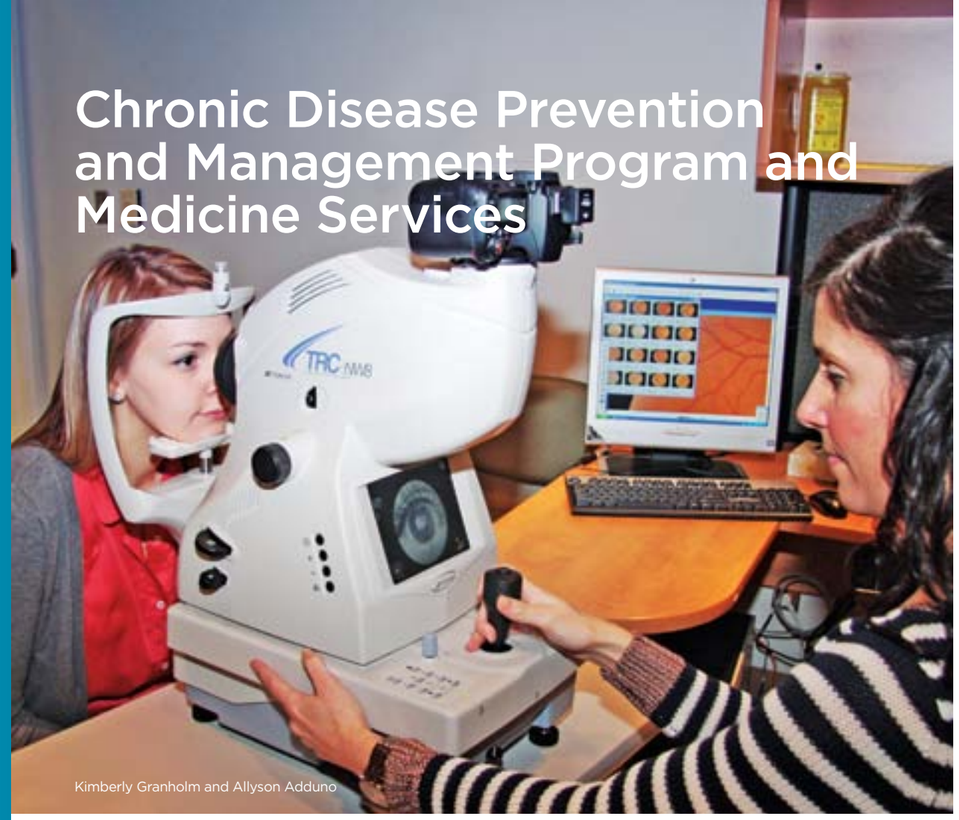
Use technology to support post-discharge follow-up using Interactive Voice Response (IVR) to reduce readmissions

Create dedicated cardiovascular and stroke program beds

Continue planning for advanced cardiac services expansion

Increase outreach/site visits

Chronic Disease Prevention and Management Program and Medicine Services



Kimberly Granholm and Allyson Adduno

DEFINITION

The Chronic Disease Prevention and Management Program includes Northwest Regional Renal Program, the Centre for Complex Diabetes Care, the Bariatric Care Centre and the Internal Medicine Clinics. The Medicine Service includes Inpatient Units 2A Renal and Medicine Care; 2B Chronic Disease, Clinical Teaching Unit and Medicine Care; and 3TM Medical Short Stay Unit, as well as the Hospitalist Service.

The new combined Program and Service focuses on four diseases/conditions: chronic kidney disease, diabetes, obstructive lung diseases (COPD & asthma) and obesity. Our Strategic Direction will be based on Ontario's chronic care model, spanning the full patient continuum and integrating primary to tertiary care assessment and management.

The Program/Service also provides leadership for the Admitting department, administrative coordinators, local ground patient transportation, and the Nurse-Led Outreach teams.

HEALTH STATUS

Northwestern Ontario has higher-than-average incidence of chronic disease including diabetes, pulmonary diseases, and renal disease. Incidence rates are particularly high among Aboriginal peoples. The region also has higher incidence of risk factors including tobacco use, alcohol use and obesity.

Chronic diseases tend to have a compounding effect. Complications of illness can also lead to other serious health issues. For example, diabetes can lead to renal failure, loss of eyesight of amputation.

The Chronic Disease Prevention and Management Program is developing new screening and prevention programs as well as new initiatives to empower patients with the skills and confidence necessary to manage aspects of their chronic diseases with their healthcare providers.

Teleophthalmology Screening Program

Early Detection of Diabetes-Related Blindness

The Ontario Telemedicine Network (OTN)'s new Teleophthalmology screening program detects diabetic retinopathy, a complication of diabetes that affects the retina (the inner lining of the eye). Diabetic retinopathy is the leading cause of legal blindness in North America, and with diabetes on the rise, the number of people affected is expected to rise as well.

To combat this, the Canadian Diabetes Association (CDA) recommends all patients with diabetes undergo retinal screening to detect the early signs of vision loss.

However, distance is a real barrier for people in Northwestern Ontario who need to access this type of care. This is especially true in fly-in First Nation communities where diabetes is widespread but access to care is difficult.

OTN's Teleophthalmology is a web-based screening program that allows patients to get their vision exams faster. The unit is portable so it can travel to the patients rather than vice-versa.

A specially-trained photographer takes a picture of the patient's eyes using a high-end camera attached to a special retinal screening device. These images are transmitted to an ophthalmologist for review.

Locally, Teleophthalmology launched on October 28, 2011. It is provided by the new Centre for Complex Diabetes Care (CCDC) at Thunder Bay Regional Health Sciences Centre and the Canadian National Institute for the Blind (CNIB) Eye Van, and is funded by the Ministry of Health and Long-Term Care. We anticipate 350 new patients with diabetes every year; those who are not already under an ophthalmologist's care will be able to have their annual screening through the CCDC.

Centre for Complex Diabetes Care

An Interdisciplinary Team for Complex Diabetes Care

Diabetes is a growing problem in the region. Provincially, 11% of the population has this chronic disease, and those numbers are even higher in Northwestern Ontario.

In 2011, Thunder Bay Regional Health Sciences Centre, St. Joseph's Care Group, and Sioux Lookout Meno Ya Win Health Centre partnered to launch the Centre for Complex Diabetes Care (CCDC), a program for Level 3 patients (those most affected by the disease).

The CCDC provides a single point of access to specialized interprofessional teams using a coordinated approach to diabetes management and treatment. The CCDC team works directly with an individual's primary care provider to ensure comprehensive services are provided.

"This centre will leave a lasting legacy for many patients and families in Northwestern Ontario as these people cope with a significant healthcare challenge," said Gil Labine, First Vice Chair of the Health Sciences Centre's Board of Directors.

"At the CCDC, we recognize that the medical context of a diabetic patient and family associated with the patient is important. It is knowing that stabilizing diabetes, managing the condition, and appreciating the risk of serious associated conditions means that everyone has to be accountable for care. It doesn't go away because of the complexities. I am excited about the potential of the CCDC to help people at their time of need," said Dr. Saleem Malik, Medical Director for the CCDC.

The Ministry of Health and Long-Term Care will contribute up to $2.6 million to support the operations of the Centre.

Foundation Support

The Thunder Bay Regional Health Sciences Foundation dedicated over $200,000 in the last several years to Northwest Regional Renal Program, including funding for hemodialysis equipment at its Sioux Lookout unit. The Foundation is committed to closer-to-home treatment, which reduces travel time and costs for regional patients and promotes better overall patient care.

Meet Scientist Dr. Mitch Albert

Illuminating parts of the body never seen before

Dr. Mitchell Albert, co-inventor of hyperpolarized (HP) gas MRI, has come to Thunder Bay to realize the full potential of this promising technology for diagnostic imaging and treatment of breathing disorders as well as other diseases including cancer, stroke, and diseases of the brain.

Click to read more

ACCOMPLISHMENTS

Opened Centre for Complex Diabetes Care

Launched Regional Bariatrics Care Centre

Launched Internal Medicine Clinics, which reduce re-admissions and visits to the Emergency Department

CHALLENGES

Higher-than-average rates of chronic disease

High re-admission rates among chronic disease patients contributing to higher demand for acute care beds and higher volume in the Emergency Department

Finding proper supports for discharged patients, especially those without a primary care provider

GOALS

Implement the provincial Chronic Disease Prevention and Management (CDPM) framework

Realize a reduction of re-admission rates for patients with COPD, chronic heart failure and cancer.

Implement Ontario Wait Time Strategy as it relates to vascular access surgery for Chronic Kidney Disease patients

Improve transitions of care to and from community partners through standardized admission and discharge processes

Collaborate to develop a regional healthcare service plan to enable delivery of appropriate care in the most appropriate setting

DEFINITION

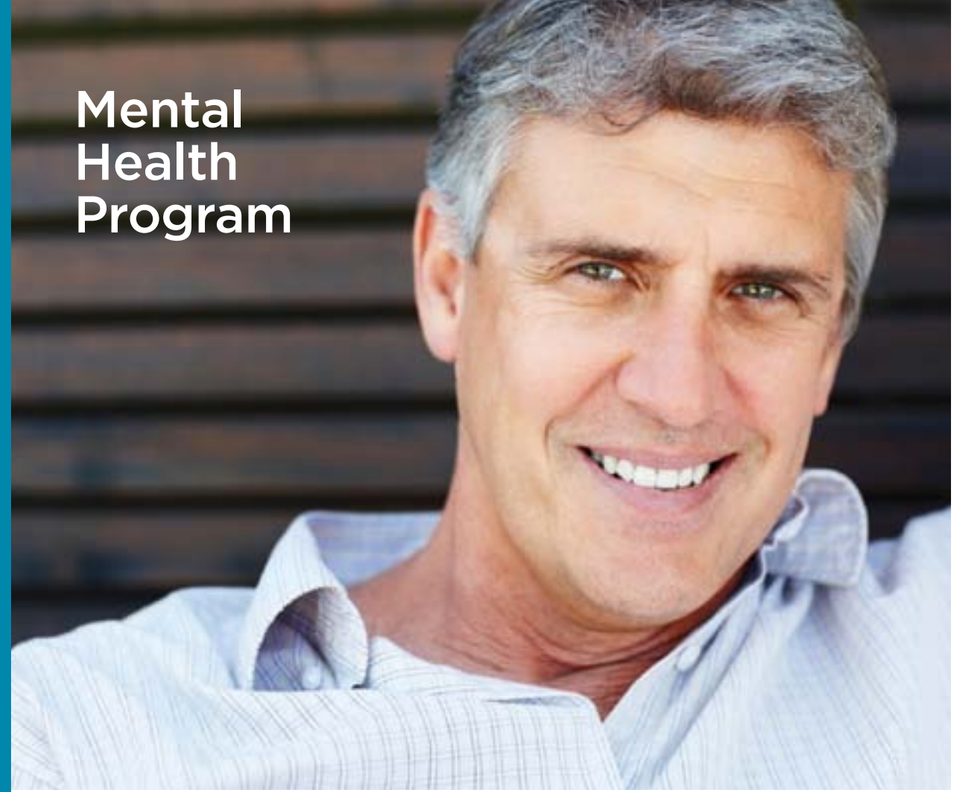
The Mental Health Program provides intensive inpatient and outpatient care including:

- Emergency department assessment services
- Short-term inpatient assessment
- Stabilization treatment
- Discharge planning
- Outpatient assessment and treatment services
- Consultation to other units and mental health education are also offered

The Program includes:

Adult Mental Health

Forensic Mental Health



Mental Health Program

Helping People with Psychiatric Disorders Who Break the Law

There is still a considerable amount of stigma and misunderstanding when it comes to people with mental illness who break the law. It is a complex issue that requires compassion and awareness.

The Thunder Bay Regional Health Sciences Centre Forensic Mental Health Unit, a tertiary service, cares for adult individuals who come into conflict with the law and who may have a psychiatric disorder.

In Ontario, access to the forensic mental health system is almost always provided as a result of court action. At any point during proceedings in a criminal case, the court can order a psychiatric assessment to determine whether due to mental illness a person is (a) Unfit to Stand Trial or (b) Not Criminally Responsible for their actions. That person is then transferred from the criminal justice system to a forensic mental health program for assessment.

If the individual meets either condition, they remain within the forensic mental health system for treatment and rehabilitation. The Ontario Review Board, an independent tribunal established under the Criminal Code of Canada, has jurisdiction over this group of individuals.

The role of forensic mental health is not to punish, but to help rehabilitate and re-integrate people into the community. Staff members working within Forensic Mental Health Services at the Health Sciences Centre understand the issue of stigma, and are committed to treating everyone with respect and dignity. At every stage of the process staff must balance the needs and rights of the patients with that of the public in terms of security requirements.

Most patients – people who are determined not to be a threat to themselves or others – are treated through outpatient services. Currently, the program at the Health Sciences Centre serves 70 outpatients annually. The program also has a secure 20-bed inpatient unit for patients who require supervised treatment.

An interprofessional collaborative practice approach, developed over decades of research and experience, helps ensure that people with mental illness get the support they need and reduces the chance of future conflicts with the law.

Dual Committee Raises Awareness About Mental Health

Mental health is a critical element of holistic care. Yet one of the biggest barriers to promoting good mental health is the stigma surrounding mental illness – both inside and outside healthcare.

As part of the Mental Health Program, a dual committee uses both Mental Health Awareness Week (celebrated nationally in the first week of May) and Mental Illness Awareness Week (first week of October) as a time to address negative perceptions and discrimination, reduce stigma and promote good mental health. In some cases, the committee works in partnership with community agencies. The committee also organizes events within the Health Sciences Centre to highlight mental health issues.

For example, last October Mackinley Steinhoff, a local magician with schizophrenia, staged a show in the cafeteria.

> "One of the biggest things I want to do is use magic as a vehicle to removing stigma about mental illness"
>
> Mackinley Steinhoff

The initiatives of this committee are well aligned with the Health Sciences Centre's Strategic Plan. Our goals include improving the patient care experience for people living with mental illness, and providing staff with education to improve confidence and capability working with individuals with mental illness.

The committee hosts mental health workshops for staff throughout the Health Sciences Centre. Topics have included mindfulness, stress in the workplace, and coping effectively with stress. The committee also put together an interactive exposition highlighting mental health services within the Health Sciences Centre and community agencies. Evaluations of these sessions have been very positive and encourage/request more of the same.

Foundation Support

Sandra MacLean, a nurse in Adult Mental Health Services, realized that many mental health patients being discharged could use extra support to help them transition back to home. She and co-workers put together Compassion Kits to help patients get a start at home. The kits contain various items including bath and toiletry items, a book, a light bulb, and something to eat like stew or chilli.

Community donations cover about half the cost of the kit, with a Volunteer Association / Health Sciences Foundation Family CARE Grant covering the difference.

ACCOMPLISHMENTS

Enhanced assessment services in the Emergency Department for people presenting with psychiatric and/or substance use issues

Increased participation in local and regional planning regarding the management of people with substance use issues

Ongoing efforts to be more patient and family centred, including Televisitation for patients of Forensics and their families and inclusion of Patient Family Advisors in mental health strategic planning

CHALLENGES

High occupancy rates (>100%) in inpatient mental health care

Extended wait times for inpatient and outpatient mental health programs

High return rate to the Emergency Department

Stigma and discrimination associated with mental health and addiction

Fragmentation in care across healthcare, social services and the justice system

Very poor overall health for many people living with mental health and/or substance use issues

Psychiatrist recruitment

FOCUS

Create a physical environment in patient care areas and the Emergency Department that respects privacy, safety and individual needs

Improve accessibility patient and flow

Establish care pathways from the Emergency Department through inpatient care to community services

Build partnerships with primary care to improve access to healthcare services

GOALS

Reduce the impact of addictions by participating in the implementation of the Thunder Bay Drug Strategy

Continue our work with community and regional partners to improve flow and access to services

Improve the experience and outcomes for patients with mental health and/or addictions problems who are being treated on medical or surgical units by providing support and education to staff so that all patients are treated with respect and compassion

DEFINITION

Regional Cancer Care Northwest (RCC) provides comprehensive cancer care services at every step of the cancer journey from prevention, screening, diagnosis, to treatment, recovery and palliative care. Services are provided across Northwestern Ontario, from the Manitoba border in the west to Chapleau in the east, and all points north.

In 2011, the Program delivered care through a variety of programs and services including: Diagnostic Imaging, Radiation Oncology, Northwest Regional Systemic Treatment Program (chemotherapy), Surgical Oncology Network, Supportive Care, Tbaytel Tamarack House, the Nicotine Dependence Centre and other inpatient and outpatient programs.

Our Cancer Program has consistently ranked in the top three cancer programs in the province. With the launch of the new Cancer Plan 2011-2015, the Regional Cancer Program aims to deliver Exceptional Cancer Care in all areas.

Regional Cancer Care Northwest

New Diagnostic Assessment Programs (DAPs) Speed Diagnosis

Reaching a cancer diagnosis faster means that patients can start treatment earlier, which in itself can help improve patient outcomes. Diagnosis also plays an important part in patient care: the wait time between finding an abnormality or concerning symptom is found to diagnosis can be one of the most stressful phases of the cancer journey.

We have developed several Diagnostic Assessment Programs (DAPs) to speed up the time to diagnosis. Multidisciplinary teams of care professionals, including physicians, technologists, nurses, support staff and therapists, work together to accelerate time to diagnosis by removing barriers to access and improving communication.

The program launched the new Lung DAP in 2011 to reduce diagnosis wait times by more than half to 6-7 weeks. Previously, diagnosis could take up to 18 weeks.

“The DAP really helps ease anxiety and gives patients and families the support and contact they need through the entire diagnostic phase of care. Our goal is to ensure patients are active participants in the process and that they have access to the information and emotional support they need,” said Joanne Lacourciere, Director of the Cancer Program.

Incidence of lung cancer is approximately 10% higher in Northwestern Ontario than the rest of the province, according to Cancer System Quality Index (CSQI) data reported by Cancer Care Ontario in 2010.

Other DAPs include those for colorectal cancer and malignant lymphoma. The Lymphoma DAP includes an innovative new method developed at the Health Sciences Centre. Diagnosis of lymphoma requires a biopsy of the affected lymph node. Traditionally, this required surgery to obtain the tissue sample.

In some patients it is now possible to get the sample using an image-guided core needle. This outpatient procedure can be booked faster than a surgical procedure, and is less invasive than surgery, which reduces discomfort and recovery time for patients.

Cancer Plan 2011 - 2015

In June 2011, TBRHSC’s Cancer Program launched its five-year plan for Exceptional Cancer Care. The a plan focuses on delivering the highest-quality care for patients, the best possible patient experience, and the latest innovations in cancer care.

“In 2015, we will see new, one-stop cancer screening services, new state-of-the-art equipment in radiation therapy, more personalized medicine and treatment options, new electronic tools for patients, and offer patients access to their own health records, to name some of our plans,” said Michael Power, former Vice President of Cancer and Diagnostic Services.

The program ranks in the top three cancer programs in the province, though the Cancer Plan identifies several areas that could be improved. Specifically, the Plan outlines nine strategic initiatives including an Integrated Cancer Screening Program, new and expanded Diagnostic Assessment Programs (DAPs), new eHealth strategies, a new Palliative Care Program, and easier access to Supportive Care services.

“Our vision is to deliver Exceptional Cancer Care,” said Dr. Dimitrios Vergidis, Chief of Oncology. “We are a top performer in the province. To become ‘exceptional’ we must go above and beyond. That is what this plan sets out to do.”

Read the full Cancer Plan: http://www.tbrhsc.net/programs_&_services/cancer_care/Cancer_Plan_2015.pdf

Foundation Support

The Thunder Bay Regional Health Sciences Foundation couldn’t fund Exceptional Cancer Care – or any healthcare for that matter – without the support of fundraising events like the Kelly McCracken Memorial Golf Fore Hope. Through 2011, this golf tournament has raised over $814,000 for cancer care in Northwestern Ontario. It is typical of the generosity shown by participants, volunteers, and donors at over 70 events held each year in support of the Foundation.

Meet Scientist Dr. Alla Reznik

Making breast imaging better

Dr. Alla Reznik

Dr. Alla Reznik is developing a prototype mammography unit that will use new-generation X-Ray Light Valves (XLV) to improve current breast cancer diagnostic capabilities, reduce radiation exposure, and make breast imaging more comfortable for women.

Click to read more

“Our vision is to deliver Exceptional Cancer Care”

Dr. Dimitrios Vergidis, Chief of Oncology

ACCOMPLISHMENTS

Developed and launched the TBRHSC Cancer Plan, 2011-2015, a five-year plan that provides a road map to Exceptional Cancer Care

Launched new Lung and Lymphoma Diagnostic Assessment Programs (DAPs)

CHALLENGES

Low percentage of eligible adults getting screened for colorectal and cervical cancers; breast screening numbers could be improved

Screening is a low priority for many residents in Northwestern Ontario, especially in rural and Aboriginal communities

High incidence of risk factors for cancer including smoking, obesity, poor diet, poor exercise habits, and alcohol use

Geographical challenges of distance and poor transportation linkages

FOCUS

Exceptional Cancer Care, outlined in the Cancer Plan 2011-2015, has critical mandates to improve patient safety and quality and further development of effective prevention, screening, treatment, and support for cancer patients

GOALS

Recruit outstanding scientists and provide them with the necessary research tools

Appoint a Clinician Scientist in Radiation Oncology

Appoint 50% of Regional Cancer Program oncologists to Clinical Research positions

Streamline chemotherapy to reduce time spent waiting for available treatment chairs

Install two new linear accelerators (Linacs)

Pilot an electronic pathway system for primary care providers and care team to monitor patients’ progress through the diagnostic journey

DEFINITION

The Critical Care Unit (ICU) is a 22-bed Level 3 unit that serves Thunder Bay and Northwestern Ontario. ICU cares for approximately 1350 critically ill patients per year including approximately 20 paediatric patients. Types of patients include respiratory failure, heart failure, stroke, and post-operative patients requiring close observation.

The Emergency Department (ED) provides a wide array of clinical services ranging from acute critical care management (trauma, cardiac arrest) to non-urgent care conditions (sore throats, chronic disease management) for all ages, as well as access to a full range of speciality care. In 2011/2012 there were 109,165 patient visits compared to 103,374 visits the previous year.

The Trauma Program provides coordinated specialized trauma care to patients in Thunder Bay and region. In addition to inpatient services, the trauma team provides outpatient trauma follow-up, expertise in wound care, and is involved with several strategies related to injury prevention. The program provides care to approximately 300 patients per year.

The Northwest Region Base Hospital Program provides medical direction, online medical control, advanced care skills training & certification, quality management, continuing medical education, and guidance to land ambulance paramedics between Manitouwadge and the Manitoba border. This area includes 29 land ambulance service stations and over 300 Primary Care (PCP) and Advanced Care (ACP) paramedics.

Trauma Program, Base Hospital, Emergency and Critical Care Services

Shonath Kajorinne, ER nurse

P.A.R.T.Y. Program
About Reducing Risks

About 90% of so-called accidents are not accidents at all – they are predictable and preventable events. Yet injury is the leading killer of youth, claiming the lives of more people between the ages of 1 and 44 than all other causes of death combined. In many cases, alcohol is a factor.

Telling youth these facts doesn't seem to reduce incidence. The P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) Program takes a different approach to educating teenagers about the dangers of mixing alcohol with dangerous activities, including driving.

"We're not preaching about not taking risks, because we've seen that doesn't necessarily work – especially for teenagers," said Shelley Chisholm, Regional Injury Prevention Coordinator at the Health Sciences Centre. "But what we can do is educate them about what has happened to others, help them realize what the real risks are, and then give them tools to make better decisions."

Drinking and driving represents the largest area of alcohol-related injuries in teenagers, but the program focuses on other high-risk activities as well. It highlights five "positive choices" for teenagers to consider: Buckle Up (seat belts, helmets, safety gear), Look First (consider possible hidden dangers like rocks in a shallow lake), Wear the Gear (helmets when biking, skateboarding, snowboarding, etc.), Get Trained (for any activity that requires expertise like ATVs, snowmobiles, and on job sites), and Drive Sober.

As part of the program, Grade 11 students tour different areas of the Health Sciences Centre including the Emergency Department. They listen to presentations from several speakers including police officers, EMS workers, and physiotherapists who see the results of poor decisions every day. They also hear from a car crash survivor who has dealt with brain injury and physical disability for 20 years.

"We can teach our youth some basic decision-making skills that will help them avoid crossing what we call 'the Stupid Line,'" Chisholm said.

On the web: www.partyprogram.com

Emergency Department Visits

Last year, there were 109,179 patient visits to our Emergency Department. We are proud to be one of the highest provincial performers for certain wait times, and strive to improve in other areas. Strategies, including establishing a Psychiatric Emergency Service, have been identified to address challenges such as prolonged lengths of stay for admitted patients and increasing demand for service in the ED.

Improved PFCC Strategies for ICU

Based on feedback, the Critical Care Unit (ICU) is changing the way it interacts with families, incorporating them more into the treatment process. This aligns with the Health Sciences Centre's model of care, addressing the needs of the family during what is a traumatic time, and ultimately providing better patient care.

Specific initiatives include customized directional maps, a resource list of staff who can be called upon to help families find their way to the Critical Care Unit, and strategies to improve communication with family members. These include bedside whiteboards and bedside signs to remind staff of the goal to have an initial visit with the family within 30 minutes of their arrival to the Critical Care waiting room. Staff will also orientate families to the critical care environment so that they feel more welcome.

Plans are in development to build on this concept by improving the transfer process from ICU to inpatient units for smoother transitions.

Meet Scientist-Clinician Dr. David Kisselgoff
Improving quality of portable x-rays

Dr. Kisselgoff is working on an improved Mobile Radiography Unit that could significantly improve the quality of portable radiography images. The system would be used in areas where physicians need quick access to information to better treat patients.

Click to read more

Foundation Support

Children get bored in the Emergency Department waiting area, but playing or sitting on the floors exposes them to a higher risk of injury or infection. Thanks to a Volunteer Association / Health Sciences Foundation Family CARE Grant, children have a safe, family-friendly play area with chairs and tables designed from hospital-grade materials that are easy to clean and maintain.

ACCOMPLISHMENTS

Surge Capacity Management Planning put in place

The Emergency Department (ED) is one of the highest performers in Ontario for wait times related to non-admitted lengths of stay and physician initial assessment

A fast-track triage process for non-acute patients developed

Launched the STEMI program in partnership with the Base Hospital Program and Superior EMS to identify STEMI heart attacks in the field

Equipment and space enhancements in the non-acute area of the ED

Created the ED-Quality Clinical Nursing Practice Coordinator position, resulting in several quality and process improvements

Expanded hours for injury prevention and social work

Completion of approximately 10 P.A.R.T.Y. Program sessions for local high school students

CHALLENGES

For the ED, prolonged length of stays for admitted patients and increasing volume, as well as staff recruitment/ retention and space issues

Providing trauma education to regional partners

Delays in patient transfers for patients who are ready to transfer to the next level of care

FOCUS

Regional critical care outreach to serve critically ill patients in the region using Telemedicine and other technologies.

Improved ICU to ward transitioning

Participation in additional trauma-related research projects

Implement Medication Reconciliation in the ED

Co-lead the development and implementation of a Psychiatric Emergency Service

Redesign the physical space in the ED

GOALS

Expand Critical Care support to region using Telemedicine

Revise resuscitation "code policy" throughout the Health Sciences Centre and the region

Reduce ED overcrowding

Develop strategies to reduce avoidable ED visits

Create a process for interprofessional rounds for trauma patients

DEFINITION
The Women and Children's Program provides a range of services to children and families requiring care in an acute care setting for medical, surgical, or mental health illnesses using a Patient and Family Centred Care (PFCC) approach.

The Program includes the following:

- Maternity Centre
- Labour/Delivery Birthing Unit
- Maternal Newborn Unit
- Neonatal Intensive Care
- Paediatric Inpatient Unit
- Paediatric Outpatient Clinic
- Child and Adolescent Mental Health Unit

Women and Children's Program

William Genyk

Helping William

In a lot of ways, William Genyk is a normal three-year-old boy: active, boisterous, certainly gregarious. Unfortunately, being so animated can get him into trouble. William has a blood disorder called hemophilia, a disease that prevents blood clotting. Even a simple fall can result in a trip to the Paediatrics Outpatient Unit at the Health Sciences Centre for special medicine. How often does he go?

"A lot of times, probably. My parents keep telling me and telling me and telling me..." William said, trailing off as he gets distracted again.

"We were coming here every single day for the longest time," said his father, Lyle Genyk. "Now we pretty much do everything out of home."

Home care is the goal, said Wendy Kostick, a nurse at the Paediatric Outpatient Unit. Wendy took advanced training in October so she can help kids with severe hemophilia. A big part of what she does is teach families how to incorporate hemophilia into their lifestyle.

"Kids are more active and prone to accident than adults," Wendy said. Hemophiliacs have had the disorder from birth, so "by the time they get older, they have developed those skills."

It's a service that Lyle, for one, is grateful for.

"The way they treat William, it's unbelievable," Lyle said. "It's like being amongst family."

> "The way they treat William, it's unbelievable," Lyle said. "It's like being amongst family."

Youth Suicide Prevention Task Force Recognized

Angela Hill, Coordinator of the Child and Adolescent Mental Health Unit and co-chair Sheila Hansen, Public Health Nurse with the Thunder Bay District Health Unit, were the recipients of the Canadian Injury Prevention & Safety Promotion Conference's Leadership Award in 2011 for their role in the development of the Thunder Bay Youth Suicide Prevention Task Force.

The Health Sciences Centre played a leadership role in the development of the Task Force, a collaborative effort involving 26 community mental health and education organizations including Francophone and First Nation partners. The Task Force has developed awareness tools for teachers, parents, coaches (in development) and youths themselves. These include brochures, help cards, and a website www.heresthedeal.ca that outline the warning signs and provide information about where to seek help.

Another component is the Youth Suicide Rapid Response Protocol or "fan out" to help local schools cope with a suicide or other tragedy. Member organizations provide different services. For the Child and Adolescent Mental Health Unit's part, it provides assessments and safety services for those identified as being high risk for suicide themselves. "The thing with youth suicide is that there is often a ripple effect – after the suicide of one youth, other youths may start feeling suicidal or overwhelmed," Hill said. The fan out has been used five times since 2009.

Public Health Ontario has recognized the Task Force and its youth suicide prevention strategy as a "Best Practice" model.

Foundation Support

Labour and Delivery received a grant from the Thunder Bay Regional Health Sciences Foundation for new infant warmers, to give baby the best welcome to his/her new world. These are special beds where newborns can be cared for and examined in a warm, safe, and lighted area. The warmers are equipped with oxygen, suction, and temperature regulation.

Meet Scientist Dr. Laura Curiel

Incisionless surgery using HIFU

Dr. Laura Curiel and her team test the safety and effectiveness of MRI-guided, High Intensity Focused Ultrasound (HIFU) to treat uterine fibroids. Current treatment options for uterine fibroids involve traditional surgery but with this new approach, fibroids are eradicated with heat, reducing side-effects and risk.

Click to read more

ACCOMPLISHMENTS

Developed an Antenatal Electronic Health Record (AEHR) at the Maternity Centre

Transitioned Labour and Delivery, Maternal Newborn, and NICU to the provincial BORN (Better Outcomes Registry Network) database

Operated a Respiratory Syncytial Virus (RSV) immunization clinic for preterm or at-risk infants through Pediatrics Outpatient Department and Pharmacy

CHALLENGES

Addressing gaps in service related to Neonatal Abstinence Syndrome (withdrawal from opiates)

Managing bed capacity and transfers between units for admissions of less than 24 hours

Recruitment of Child Psychiatrist

FOCUS

Establish relationships with community partners and strengthen existing ones to develop care pathways for substance-using pregnant women and their infants

Collect data on short-stay paediatric admissions to find ways of reducing or avoiding admissions

Continue to work with Patient Family Advisors (PFAs) to continually improve the care experience

Continue to work with community partners to raise the awareness of issues related to mental illness and youth suicide

Continue to teach physicians, nurses, and other allied health professionals

GOALS

Increase prenatal care to methadone-using women who do not have a primary healthcare provider via a bi-weekly prenatal clinical at the methadone clinic sites

Incorporate Provincial Council for Maternal Child Health (PCMCH) guidelines into our current practice relating to Neonatal Abstinence Syndrome

Use a new screening tool to help postpartum mothers and infants transition home and to community service providers, in partnership with the Thunder Bay District Health Unit

Implement and evaluate the new Neonatal Resuscitation Program (NRP) guidelines and train the interdisciplinary team that provides care for critically ill newborns

DEFINITION
The Prevention & Screening Service provides leadership and services in disease prevention and screening. The Service has increased its mandate to encompass the general well-being of residents of Northwestern Ontario. By promoting healthy lifestyles to reduce the risk of cancer, we also reduce the risk for other conditions including heart disease, diabetes, COPD, renal disease, and other chronic diseases.

ACCOMPLISHMENTS
Established the new Service to provide prevention and awareness as well as screening services for a wide range of diseases and conditions

Continue to develop specific screening programs including breast, cervical, and colorectal screening

CHALLENGES
Identifying the needs of a broader mandate, and creating a screening and prevention strategy that meets those needs

Providing prevention and screening services to a large geographic area, especially remote Aboriginal communities throughout Northwestern Ontario

FOCUS
Develop a comprehensive prevention and screening strategy for Thunder Bay and all of Northwestern Ontario

GOALS
Launch the Integrated Screening Program, which includes three Cancer Care Ontario (CCO) screening programs: ColonCancerCheck, the Ontario Breast Screening Program (OBSP), and the Ontario Cervical Screening (OCS) Program

Launch the new Integrated Screening Program coach in 2012

Increase screening in each of the three CCO screening programs by 10% each year for the next four years

Streamline the process by which patients access results in cases of abnormal screening results

Prevention & Screening Services

Under/Never Screened Initiative Targets Earlier Detection

In Northwestern Ontario, rates for chronic diseases continue to be the highest in the province. While the region is doing well in breast screening with higher than provincial survival rates, the region has one of the lowest rates for eligible men and women who participate in ColonCancerCheck, the province's organized colorectal screening program. As a result, men and women are often diagnosed with later stage illness and colon cancer survival rates are below those in the rest of the province. Less than one in three women in the region are up-to-date with cancer screening for breast, cervical and colorectal screening.

As part of our strategy to improve the health of our population, we launched the two-year Under and Never Screened Initiative in 2010 to reach eligible adults who do not currently participate in organized screening for breast, colorectal, and cervical cancers.

Programming to support prevention and screening for all chronic diseases is underway, including Your Health Matters, a workplace and community-based healthy lifestyles program. Training for lay leaders and health care providers has included volunteers who delivered the program in seven remote communities.

New technology is assisting us to better understand the health profiles of specific neighbourhoods and communities across the region. We can use Cancer Care Ontario's Geo Mapping system to pinpoint regional sites for mobile coach visits and screening drop-in locations, based on the specific demographics and screening rates of adults living in these areas.

Sioux Lookout's Meno Ya Win Health Centre is a significant partner in the development of long-term strategies to improve access for chronic disease prevention and early detection for residents of northern, rural, and remote communities.

Meet Scientist Dr. Ingeborg Zehbe

New HPV screening methods for Aboriginal women

Dr. Zehbe and her team conducted an HPV self-sampling pilot test involving 49 Aboriginal women. The group is now working on the second phase of the study involving over 1000 participants from 10 First Nations communities in the region.

Click to read more

Diagnostic Services

Top row: Janet Loucks, Carrie Rubin, Craig Willson, Cathy Costanzo
Bottom row: Michelle Opaski, Debbie Ricci

128-Slice CT Scanner Provides Hi-Res, Low Dose Images

The new 128-slice CT scanner will significantly improve patient care, providing higher resolution images faster and at a lower dose of radiation.

Stephen Exley, Manager of Molecular Imaging at the Health Sciences Centre, said that minimizing radiation dose to the patient was a priority.

"Every patient, from the paediatric patient to the bariatric patient, will get the lowest possible dose," Exley said.

It does this by actually gauging body size and mass, even adjusting dose rates as it passes over different parts of the body so that "thinner" parts of your body will receive less radiation.

Resolution is also greatly improved. For CT scanners, the number of slices is similar to the number of mega pixels for digital cameras. Going from a 16-slice scanner to a 128-slice gives you an idea of the jump in image quality.

The higher resolution allows for certain procedures like CT-guided biopsies. Faster scanning time means that patients need to hold their breath for seconds instead of minutes, and will also contribute to higher image resolution.

"It doesn't matter your age, it doesn't matter your size, we can provide a quality image at the lowest dose possible," Exley said.

Foundation Support

For certain women at high-risk of breast cancer, breast MRI is a highly sensitive imaging device (88%-100%) that can detect abnormalities that other tests cannot. The Thunder Bay Regional Health Sciences Foundation dedicated $185,000 – raised at the Bearskin Airlines Hope Classic curling bonspiel – to purchase the dedicated breast MRI coil and MRI-safe biopsy devices.


Dr. Panu

DEFINITION
Diagnostic Services include Clinical Laboratory and Pathology, Cardio/Respiratory, and Diagnostic Imaging. Services are provided to inpatients, patients admitted to the Emergency Department, and outpatients referred from Thunder Bay and region.

ACCOMPLISHMENTS
Installed new 128-slice Computerized Tomography (CT) scanner

Launched 'Powerscribe', which enables physicians to dictate reports using voice recognition software

Recruited Dr. Richard Bitar, whose focus will be on imaging and cancer mapping, and Dr. Jonathan Boekhoud in Nuclear Medicine

Implemented new Immunohistochemistry (IHO) stainer for faster cancer diagnosis

Introduced a Compassionate Burial policy to respect the cultural beliefs of Aboriginal communities and others

Launched flow cytometry program to help diagnosis lymphomas and leukemias

Launched Lymphoma Diagnostic Assessment Program (DAP) for faster lymphoma diagnoses

Improved bone marrow collection procedures

Improved quality audits in Haematology

Improved computerized cross-matches for Transfusion Medicine

Improved test utilization to eliminate redundant tests in areas like cardiac, thyroid, and blood work

Became Synoptic Lead for cancer reporting via standardized College of American Pathologists checklists

CHALLENGES
The number of diagnostic tests ordered exceeded provincial averages

FOCUS
Continual improvement of our quality assurance policies, including upgrading reporting software with feedback review as part of its processes

GOALS
Create partnerships with primary care physicians and teams in Thunder Bay and elsewhere

Join a Magnetic Resonance Imaging (MRI) and Computerized Tomography (CT) pilot project in partnership with local and regional care providers

Surgical and Ambulatory Services

DEFINITION

The Surgical Service provides inpatient and outpatient services for general, neurosurgical, orthopedics, ENT (Ear, Nose, and Throat), gynecological, plastic, oral and dental, ophthalmology, thoracic, vascular, urology and endoscopic services in a comprehensive care environment delivered by an interprofessional team.

The Service works closely with community partners, planning and providing preoperative and postoperative assessments as well as coordinating follow-up care to help improve patient outcomes.

The Ambulatory Care Unit (ACU) oversees several clinics including colposcopy, urology, urodynamics, dressing/wound care assessment clinic, intravenous therapy, cystoscopy, dermatology, fracture clinic, laser clinic, medical surgical (Minor Medical/Surgical Procedures), ophthalmology, and PICC Line Services. In addition, ACU oversees the Sexual Assault/ Domestic Violence Treatment Centre and operates the Pre-Admission Clinic.

The ACU also coordinates a variety of Health Sciences Centre resources for procedures that need to be performed in an acute care setting. The ACU operates completely on a referral basis from area physicians with the exception of the Fracture Clinic which accepts referrals from physicians in the Emergency Department.

ACCOMPLISHMENTS

Met wait times targets for surgeries

Secured funding for bariatric surgery

CHALLENGES

Recruiting staff

"Right sizing" of services to ensure a high level of patient care through the most efficient use of human resources

FOCUS

Analyze services provided matched against wait times, patient needs, funding models to enhance patient care

GOALS

Increase the focus on research and teaching with residents and medical students

First Carotid Stent Implanted

Dr. Greame Marchuk

In what might loosely be called "angioplasty for stroke prevention", Dr. Greame Marchuk performed the Health Sciences Centre's first carotid stenting procedure on September 12, 2011. This procedure helps reduce the risk of stroke in a patient by compressing plaque in the carotid artery. "It's a step forward for local stroke management and patient care," said Dr. Marchuk.

Stroke is essentially some form of blockage that prevents blood – and therefore the oxygen it carries – from reaching the brain. Plaque can build up over time or a piece of plaque can break away and lodge in a narrow artery, restricting blood flow.

The carotid artery is a major trouble spot. Plaque tends to build up where the artery branches in two in the neck, one supplying blood to the face and the other directly to the brain. Placing a stent at this fork opens the artery and reduces the risk of plaque breaking away. It is less invasive than the traditional method of surgically removing plaque.

In the first month of the program, Dr. Marchuk did four carotid stenting procedures including one from the region. He expects to see about two to three patients per month on average, he said.

Foundation Support

Surgery can be stressful for anyone, but for children it can be especially scary. Now, children can ride to the OR in a brand new red Radio Flyer wagon, purchased with a Volunteer Association / Health Sciences Foundation Family CARE Grant. Twelve-year-old Connor Ferguson helped put the idea into action. "It takes the kids' minds off of surgery," Connor said.

Supportive & Palliative Care, and Telemedicine Services

DEFINITION

Supportive & Palliative Care, and Telemedicine Services focuses on a whole-person and Patient and Family Centred Care (PFCC) approach, addressing the social, psychological, emotional, spiritual, and functional aspects of a patient throughout his or her journey.

Each program within the Service provides for the unmet needs of its patient population with the help of an inter-professional team. The Service also provides urgent psycho-social/spiritual care in response to a sudden, tragic, or traumatic event.

The Service now includes Telemedicine, which provides consultations, education, and meeting capabilities via videoconferencing as part of the Ontario Telemedicine Network (OTN).

ACCOMPLISHMENTS

Expanded the mandate to include all Health Sciences Centre Programs

Added Palliative Care to the Service

Developed a system of secondary reporting to Professional Practice Leads for Psychology, Social Work, and Spiritual Care

Arranged training for five Spiritual Care Clinicians Added Telemedicine to the Service

CHALLENGES

Identify the "best mix" of the care professionals for each Program

Identifying and meeting the continuing education needs of our professionals

FOCUS

Coordinate and match our expertise with program needs to provide PFCC-driven supportive care, palliative care, and Telemedicine services

GOALS

Build a Telemedicine Strategic Plan. Lay the groundwork through engagement for the development of a comprehensive five-year Palliative Care plan

Ensure that excellent psychosocial and spiritual-care professional practice methods are imbedded in every Program that include interns, residents, and students

Televisitation

A Key Supportive & Palliative Care Tool

Geography is one of the major barriers to healthcare we face in Northwestern Ontario. For patients, travelling to get healthcare can be costly, time-consuming, and stressful.

Telemedicine aims to overcome that barrier by allowing patients and clinicians to connect via videoconference. That means that instead of travelling to Ottawa for a 15-minute appointment with a specialist, you could request the appointment be made through Telemedicine, saving the time and expense to travel.

This is just one example. In fact, Telemedicine was used in over 30 programs last year for different types of events like clinical consultations as well as educational sessions and administrative meetings. At one point, it was estimated that Telemedicine saved approximately 45 million kilometres in patient travel, and $18 million in associated costs.

In 2011/2012, 96 providers from a number of professions (e.g., physicians, nurses, social workers) at the Health Sciences Centre used Telemedicine for a total of 9,179 Telemedicine events, up from 8,374 events the previous year. There are 22 Telemedicine suites in the Health Sciences Centre that can connect with 54 communities in Northwestern Ontario including 28 First Nations communities, as well as with major centres in Ontario and elsewhere.

One area in particular – Televisitation – was designated an Accreditation Canada "Leading Practice" in 2011. Primarily, this is used to connect regional patients at the Health Sciences Centre to their family and loved ones in their home communities. It has also been used in other circumstances, including in one situation when a family member was quarantined. Televisitaton reduces loneliness and isolation for better patient care – and possibly better outcomes.

Foundation Support

The Tbaytel Tamarack House on the fifth floor of the Medical Building is a "home away from home" for regional patients undergoing cancer treatments in Thunder Bay. The Health Sciences Foundation continually provides equipment and amenities to make their stay more comfortable. This past Christmas, the Foundation surprised residents with two flat screen TVs thanks to a gift from the Dryden Rotary Charity Foundation.

World Class healthcare and our accomplishments are possible through the hard work and dedication of all of our physicians, staff, volunteers, patients and families, and the support of the following departments:

- Administrative Staff
- Admitting
- Capital Program Planning
- Chief of Staff Office
- Clinical Trials
- Communications & Engagement
- Corporate Services
- Financial Services
- Health Records
- Housekeeping
- Human Resources & Organizational Development
- Infection Control
- Information Systems
- Information Technology
- Labour Relations
- Laundry and Linen Services
- Library
- Mail Service
- Material Distribution
- Medical & Academic Affairs
- Northwest Regional Supply Chain - Sourcing and Contracting
- Nutrition and Food Services
- Occupational Health & Safety
- Patient and Family Advisors
- Patient Care Services
- Pharmacy
- Physical Plant and Biomedical
- Quality Management
- Research Ethics
- Security
- Strategy & Performance Management
- Supply Process Distribution
- Telecommunications
- Thunder Bay Regional Health Sciences Foundation
- Volunteer Association to Thunder Bay Regional Health Sciences Centre
- Volunteer Services

Support Departments

Top row: Chris Hudema, Jan Ahonen, Walter Kocuba, Joanne Gothard, Joanne Hergott, Nick Cavezza, Darlene Kuzior, Sherry Hrychuk, Scot Montgomery, Noreen Kivi. **Bottom row:** Tanis Blais, Deb Fredrickson, Suzanne Plante, Jolene Gaudette

Laundry and Linen Services

An integral part of patient care

Imagine the task faced by Laundry and Linen Services at Thunder Bay Regional Health Sciences Centre. The department serves all patient care areas and processes over a million kgs of laundry each year.

It takes a dedicated team to get the job done. “Laundry and Linen is one of the ‘invisible’ services integral to patient care,” says Nick Cavezza, department manager. “We’re part of the healthcare team contributing towards effective and efficient patient care at our Health Sciences Centre.”

Laundry and Linen Services is comprised of 28 full and part time employees, as well as a volunteer Patient and Family Advisor (PFA) who provides input to enhance the patient experience. “The PFA provides a new perspective to help us better meet the needs of patients through suggestions regarding our services and products. For example, the PFA can tell us if our towels are large enough or blankets are warm enough,” explains Cavezza.

The department is also focused on infection control. “Soiled linen must be collected and sorted, and until it is cleaned, it is all considered contaminated,” says Cavezza. Procedures are in place to protect patients and employees. There are separate areas for soiled linens, and employees must wear isolation gowns and gloves where soiled linens are sorted.

Contributing to patient care also means implementing new technologies. “We constantly look for opportunities to reduce costs while enhancing service,” notes Cavezza. For example, energy-efficient bedspreads with improved heat retention values reduce the number of spreads required and keep patients warmer. The result is more effective care, reduced workload and cost-savings.

DID YOU KNOW...

Work in Laundry and Linen Services begins at 5:00 am daily.

The majority of linens are folded by automated equipment.

All loads of laundry are washed at 170˚C.

All cleaning chemicals are automatically injected into laundry machines.

Financial Statements

Thunder Bay Regional Health Sciences Centre continues to manage resources responsibly and has a history of operating in a surplus financial position. In 2012 TBRHSC finished in a deficit position of $1.9 million compared to a deficit of $2.3 million in the prior year. The shortfall over the last two years is a result of the Health Sciences Centre providing services to the community and region above our funding corridor. The Health Sciences Centre serviced 2,300 weighted cases above our funded activity. TBRHSC has one of the lowest administrative and support service expense levels in the province, demonstrating our efficiency and commitment to maximizing resources towards patient care. TBRHSC continues to work with the Local Health Integration Network (LHIN) to resolve this issue.

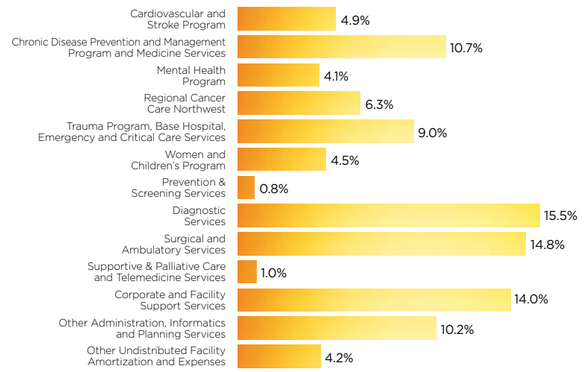
Statement Of Financial Position

March 31, 2012 (Amounts in $ thousands)	2012	2011
ASSETS		
Current assets	28,982	28,779
Non-current assets	246,473	256,185
Total Assets	275,455	284,964
Liabilities and Fund Balances		
Current liabilities	40,339	40,175
Non-current liabilities	222,717	230,323
Total liabilities	263,056	270,498
Fund Balances	12,399	14,466
Total Liabilities and Fund Balances	275,455	284,964

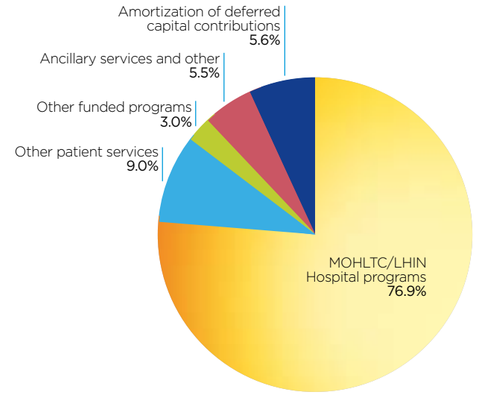
Statement Of Operations

For the year ended March 31, 2012 (Amounts in $ thousands)	2012	2011
REVENUE		
Ontario Ministry of Health and Long-Term Care / North West Local Health Integration Network	227,104	221,085
Other patient services	26,716	26,721
Other funded programs	8,727	7,312
Ancillary services and other	16,246	15,117
Amortization of deferred capital contributions	16,420	19,738
	295,213	289,973
EXPENSES		
Salaries and benefits	199,003	195,068
Medical, surgical supplies and drugs	34,919	33,866
Supplies and other	22,666	21,665
Other funded programs	8,744	7,226
Plant operations and equipment maintenance	10,517	13,614
Amortization	21,245	20,868
	297,094	292,307
Deficiency of revenue over expenses	(1,881)	(2,334)

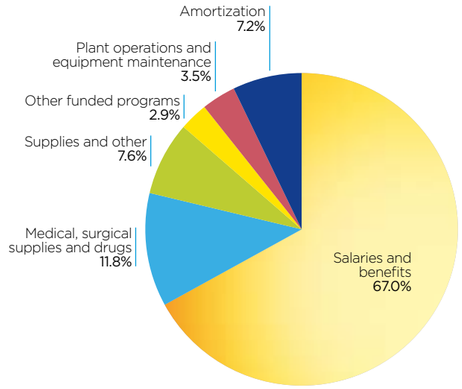
Expenses by Program and Service



Revenue



Expenses



Academic

The Thunder Bay Regional Health Sciences Centre and the hospitals that came before it have a long tradition of teaching the next generation of healthcare providers. We are the largest facility in the region for physician students from the Northern Ontario School of Medicine (NOSM) – and other medical schools – who require practical, hands-on experience.

But it's not just doctors. It's also nurses, physiotherapists, social workers, dieticians, physician assistants, counsellors, and care providers from almost every healthcare profession. Patients get immediate benefits as well: several studies have shown that teaching hospitals tend to provide better patient care. Research thrives in an academic environment too.

The Health Sciences Centre is one of only 24 members of the Council of Academic Hospitals of Ontario (CAHO), which provide the most complex and urgent care, teach the next generation of healthcare providers, and foster healthcare innovation through research and discovery. We are proud to be part of such an elite group.

Health

The Thunder Bay Regional Health Sciences Centre is continually improving its programs and services to meet the needs of Northwestern Ontario. In order to do that more efficiently, we recently adopted a Patient and Family Centred Care (PFCC) model of healthcare. In short, it means treating the patient – and their families – instead of treating the disease. This philosophy literally changes our approach to everything we do.

Central to this is the Patient and Family Advisor (PFA) program. Over 85 former patients and family members of patients sit on more than 200 committees that determine everything from forming new policies to hiring program directors. Despite their lack of formal medical knowledge – or perhaps because of it – PFAs offer new insights into patient care.

Healthcare doesn't start and stop at the Health Sciences Centre doorways either. We are continually developing community partnerships throughout the region to improve our continuity of care for a smoother transition in and out of our programs to meet our Vision of being "Healthy Together."

Sciences

The Thunder Bay Regional Health Sciences Centre has worked hard to develop the growing scientific community we have today. From the early days of cancer research 20 years ago funded by the Northern Cancer Research Foundation, to developing partnerships with Lakehead University, other researchers around the world through clinical trials, and now the Thunder Bay Regional Research Institute, the Health Sciences Centre has become known as a world-class centre for research in a very short time. We are listed in the Top 40 Research Hospitals in Canada as one of the fastest growing programs.

That's important for many reasons. Of course, there are the economic benefits to the region. But there are clear patient benefits as well including new equipment like the PET scanner, the opportunity to join cutting-edge clinical trials, and other advantages that being a research centre brings. We are also attracting some of the best care providers because of our emphasis on research.

Centre

The Thunder Bay Regional Health Sciences Centre serves the largest region in Ontario, and indeed one of the largest areas in the world. Distance is a real barrier to providing timely, quality care to an area the size of France, but with a population that's about 10% that of Toronto.

We're finding innovative ways to overcome that barrier. We deliver a number of programs and services to the region that are becoming recognized world-wide. Our Regional Cancer Program supports 13 satellite sites throughout the region where patients can receive chemotherapy and in some cases other cancer services closer to home. We were pioneers in what has now become our Telemedicine Program, providing consultations, education, and even meetings to benefit patients via videoconference by connecting with over 50 sites in the region and countless others around the province and elsewhere.

Most importantly, we have become a leader in the region, creating a model of quality, timely, closer-to-home patient care for everyone in Thunder Bay and across Northwestern Ontario.

Bringing
Discovery to Life

Thunder Bay Regional
Research Institute

In partnership with
Thunder Bay Regional Health Sciences Centre
Affiliated with Lakehead University

Patients Guide the Research Journey

THUNDER BAY REGIONAL RESEARCH INSTITUTE / 2011 - 2012

Cyclotron is coming to town

Medical isotopes will fuel research, patient care, and sustainability

Revolutionizing non-invasive imaging

HP gas MRI breathes deep for new look at lungs

Labours of the Mind Have Value

Nurturing good ideas first step on road to commercial and social return

Also in this issue:

Contents

Thunder Bay Regional
Research Institute

In partnership with
Thunder Bay Regional Health Sciences Centre
Affiliated with Lakehead University

Tel. 807 684 7223

ICR Discoveries
290 Munro Street
Thunder Bay, ON P7A 7T1

Translational Research Office
980 Oliver Road
Thunder Bay, ON P7B 6V4

www.tbrri.com

Thunder Bay Regional Research Institute – an independent, not-for-profit corporation – is the research arm of the Thunder Bay Regional Health Sciences Centre. Our scientists work closely with clinicians, medical professionals, and academic and industry partners to improve healthcare through excellence in patient-centred research focused on three molecular imaging-based platforms.

Research is advanced through discovery and development of new technologies and processes that are brought to patients through clinical trials. With successful trial validation, discoveries proceed to commercialization for the benefit of patients everywhere.

MISSION:

to advance healthcare through excellence in patient-centred research.

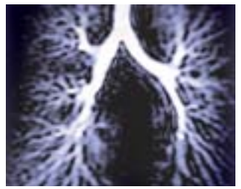
COMMITMENT:

to advance new standards of excellence in the clinical investigation of novel molecular imaging-based diagnostic technologies.

PROMISE:

to bring discovery to life through translational research and world-class patient care.

Research Themes

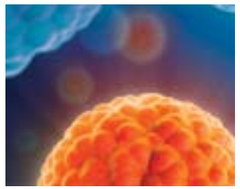


ADVANCED DETECTION DEVICES

Advanced detection devices, including x-ray, Positron Emission Tomography (PET), and Magnetic Resonance Imaging (MRI), can better detect small tumours in the body and improve treatment planning.

IMAGING GUIDED INTERVENTIONS

By using an imaging technique like MRI, imaging guided interventions can improve surgical procedures to guide new treatments that result in better outcomes and faster recovery for patients. Currently, High Intensity Focused Ultrasound (HIFU) is being used to destroy tumours using heat without the need for surgical incision.



PROBE DEVELOPMENT AND BIOMARKER EXPLORATION

Probes, or biomarkers, are radioactive isotopes or drugs inserted into the body to seek out cancer cells at the molecular level. Using MRI or PET, cancer cells "light up" making early detection possible with non-invasive techniques.

Message from the Chair of the Board

FIVE YEARS OF SUCCESS

I am proud to serve as Chair of an organization that has grown in leaps and bounds over the past five years thanks to overwhelming faith and support from leaders in government, academia, business development, industry, the community, and funders such as the Thunder Bay Regional Health Sciences Foundation.

My pride was bolstered when the Thunder Bay Chamber of Commerce awarded TBRRI the Not-for-Profit Business Excellence Award at the annual awards gala in May. I am continually amazed at the research drive and global vision of this persistent, creative group. As our City and region struggle to restore our resource-based economy, I believe more firmly than ever that it is intellectual capital – bright minds – that will catalyze our strengths, step by step, to ensure our sustainability.

Tornado Medical Systems, a medical imaging company with offices in Thunder Bay, is working in tandem with Clinician Scientist Dr. Jae Kim to build a prototype of an imaging device that will revolutionize breast cancer surgery outcomes for women everywhere. Also underway, is collaboration with MaRS Innovation to commercialize Dr. John Rowlands' X-ray Light Valve system that produces lower-cost higher-quality digital X-ray images with four times less radiation exposure.

This is the kind of global thinking and solutions that our community is capable of creating.

Our research talent is superlative and they have come here from all over the world because Thunder Bay offers the best of many worlds – a state-of-the-art academic work environment, unique and progressive research programs, and a wonderful quality of life.

This year, the Board says thank you and good bye to members Lyn McLeod, Fred Gilbert, and Wayne Schnarr, and remembers with great respect and admiration, Michael Gourley, an exceptional Board member who passed away in March of this year.

Finally, we wish outgoing CEO Michael Power every success as he takes on a new role with a major medical firm, and heartily welcome Dr. Michael Wood as the CEO of TBRRI.

I am fortunate to work with dedicated and passionate colleagues who push the limits of research as we work to develop cutting-edge technology to detect and diagnose disease to enhance the healthcare of people worldwide.

Keith Jobbitt, BA, LLB

Chair of the Board, TBRRI

Message from the Chief Executive Officer

FUTURE LOOKS BRIGHT

As we near the close of our first five-year plan, the future looks bright.

Thunder Bay Regional Research Institute (TBRRI) has experienced an excellent growth trajectory for almost five years now and we continue to attract scientists, research staff, and students. This year, we welcomed two new scientists: Dr. Lily Wu, who focuses on the causes and treatment of cardiovascular disease, and Dr. Jane Lawrence-Dewar, who uses functional MRI to understand how brain reorganization during stroke rehabilitation leads to motor recovery.

Most Canadians believe that Canada should be a global leader in health and medical research, and Northwestern Ontario's medical healthcare cluster is at the forefront of that ambition. Our scientists are entrepreneurs, drivers of change, and their work is poised to have global significance. Despite being one of Canada's newest and youngest research institutes and academic health sciences centres, Thunder Bay Regional Health Sciences Centre was named one of Canada's Top 40 research hospitals this year by Research Infosource.

We believe that excellent healthcare is vital to our growth as a community and we are proud to partner with other organizations who share our vision. And, I can't say enough about the support and investments of our local, provincial, and federal governments — Mayor Keith Hobbs, Minister Michael Gravelle and MPP Bill Mauro, MP Greg Rickford and Minister Glen Murray, and the Honourable Minister Tony Clement who travelled to Thunder Bay in March to cement final funding for our new cyclotron facility and bring good news to Tornado Medical Systems and Lakehead University that will help strengthen our growing research and healthcare cluster.

This year, Thunder Bay welcomed the first satellite office of Cancer Care Ontario to join the collaborative environment at ICR Discoveries. Our clinical trials program is working with the Ontario Institute for Cancer Research to ensure that patients in Northwestern Ontario have access to additional treatment options. And, Dr. Ingeborg Zehbe and her team were awarded TBRRI's first CIHR operating grant for their work in an Aboriginal population.

The Institute is indebted to the vision, hard work and determination of outgoing CEO Michael Power. As I take over the CEO reins, I am confident that TBRRI will continue to develop a reputation for scientific excellence, grow clinical trials, and contribute to the knowledge economy to ensure a vibrant, sustainable future for the Institute and for the people of Northwestern Ontario.

Michael Wood, PhD

Chief Executive Officer, TBRRI

Vice President Research,
Thunder Bay Regional Health Sciences Centre

2011 - 2012 Goals and Accomplishments

EMPLOYMENT/ RECRUITMENT/ LEADERSHIP

Establish a scientific program that is recognized for excellence internationally.

Two new scientists, Dr. Lawrence-Dewar and Dr. Wu, recruited

New Director of Research Operations, Dr. Michael Campbell, recruited

TBRRI CEO Dr. Michael Wood appointed to Clinical Trials Ontario Board

Dr. Chris Phenix invited to serve on review panel for Canadian Breast Cancer Foundation application panel for early detection

Dr. Mitch Albert's research featured in Research Canada's News to Parliamentarians

Hosted the Ministry of Economic Development and Innovation's Advanced Medical Devices International Media Tour

TANGIBLE SUCCESS

Within 3-5 years, ensure that at least one technology is co-developed with industry partners and enters clinical trials.

Dr. Alla Reznik received $100,000 MaRS Innovation PoP Grant for Mammography Using New Generation X-ray Light Valves – Clinical Prototype

XLV Diagnostics Inc. received $200,000 in new financing from OICR and partners TBRRI, Sunnybrook Research Institute (SRI) and MaRS Innovation

HTX provided $750,000 in funding through the Technology Acceleration Program to Tornado Medical Systems Inc., a TBRRI spinoff company, to support the commercialization of Dr. Kim's research

Tornado Medical Systems Inc. received $363,348 from FedNor to advance the Tumour Margin Project of TBRRI scientist Dr. Jae Kim

TRANSLATIONAL FOUNDATION

Build a foundation for translational research at the Thunder Bay Regional Health Sciences Centre.

Thunder Bay participates in the Ontario Institute for Cancer Research (OICR) High Impact Clinical Trials Program – Genomics Cohort Study for Ontario Clinical Trials

Dr. Ingeborg Zehbe won a 2011 CQCO Quality and Innovation Award for the Aboriginal Human Papillomavirus (HPV) Screening Trial

New Director of Clinical Trials, Sandra Stoger, recruited

New Master Research Agreements with industry partners under development

ECONOMIC GROWTH

Work actively with local, regional, provincial, federal and industry partners to build health research and commercialization capacity in Northwestern Ontario.

Provincial funds of $1M support R+D xenon polarizer platform to revolutionize HP gas MRI non-invasive imaging

New Director of Business Development and Commercialization, Scott Gillis, recruited

Thunder Bay Chamber of Commerce Award for Not-for-Profit Excellence

TBRHSC named one of Canada's Top 40 Research Hospitals

Janet Northan, Director, Government Relations, appointed to Thunder Bay Chamber of Commerce

SUSTAINABILITY

Ensure that TBRRI is scientifically and financially sustainable by 2012.

$9.4 million in funding secured for cyclotron facility and radiopharmacy

Cancer Care Ontario established a satellite office at TBRRI facility

Dr. Ingeborg Zehbe receives $600,000 CIHR grant to support cervical screening research study focused on Northwestern Ontario First Nations women

Secured over $14M in scientific research grants since 2007

79 scientific publications in peer-reviewed journals

Celebrating Five Years of Success

Research Dedicated Lab and Support **Staff**

15 (2008) >100 (2012)

Supported **Scientists**

3 (2008) 14 (2012)

More than **72** **Students** have the opportunity to work with scientists

550+ **Patients** from NWO participated in 60+ trials opened since 2008

New **Medical Biophysics Graduate Program** to be launched in 2013

3 **Medical Physics Courses** offered

$128M in economic activity

3 **Lakehead University** Appointed Research Chairs

7 Homegrown **patents** in 3 areas of research

$14M **Scientific research grants** since 2007

2 Spin-Off **Companies**

30 Spin-Off **Jobs**

TBRHSC one of Canada's **TOP 40** Research Hospitals in 2011

CYCLOTRON

IS COMING TO TOWN

Thunder Bay's medical cluster is hot and getting hotter with ground breaking for the new cyclotron facility scheduled in the fall of 2012. With funding commitments from all levels of government ($3.9M Government of Canada, $4M Province of Ontario, $1.5M City of Thunder Bay), the Thunder Bay Regional Research Institute (TBRRI) cyclotron project has a green light to go ahead. Site selection is made, drawings are being completed, and the project is moving forward at full speed.

NOT ALL CYCLOTRONS ARE CREATED EQUAL

Cyclotrons used in hospitals produce F-18 FDG, the isotope needed for Positron-Emission Tomography (PET) imaging. The Thunder Bay cyclotron, a TR-24 from Advanced Cyclotron Systems Inc. in Richmond, BC, is a high energy cyclotron capable of making common PET isotopes plus a full spectrum of Single Photon Emission Computed Tomography (SPECT) isotopes such as Tc-99m, Ga-67, Cu-64 and I-123.

In addition to fueling an important radiopharmacy operation to produce medical isotopes for use in diagnostic testing at Thunder Bay Regional Health Sciences Centre, the cyclotron will allow scientists like Dr. Chris Phenix to conduct world leading research to discover new and better radiopharmaceuticals that will aid in earlier detection of diseases, identifying where cancer cells have spread, and targeting drug delivery to tumours. Cyclotron production can help ensure the future growth and diversity of nuclear medicine in Canada and facilitate research and innovation.

"It is very clear that the future of healthcare is tied to enhanced diagnostics. We're moving away from anatomical images using CT and MRI scanners which take pictures of bone and muscle, to imaging techniques like PET that literally seek out and light-up the area of disease and identify disease function at the cellular level."

Dr. Christopher P Phenix, TBRRI Scientist

Dr. Chris Phenix, TBRRI Scientist
Dr. Michael Campbell, TBRRI Director of Research Operations

WHAT IS A CYCLOTRON?

A cyclotron is a machine that makes short-lived radioisotopes for medical imaging. A cyclotron takes hydride atoms (the same as hydrogen atoms that make up water but with a negative charge) and accelerates them to very high speed. When they have enough energy (the TR-24 can accelerate a hydride atom to about 68,000 km/second, or just under a quarter of the speed of light), the atoms are directed at a target. In much the same way that the cue ball transfers its energy to a pool ball and sends it on its way, the now positively charged hydrogen atom (proton) knocks out a neutron in the target material to produce a new radioactive element to be used for patient care and research.

THE MOST VALUABLE RESOURCE A PROVINCE HAS IS ITS PEOPLE

The cyclotron facility will ensure that educated, highly skilled individuals are trained, developed, and retained in Northwestern Ontario and support the already collaborative environment that exists in Thunder Bay among public and private partners, clinicians, and learners.

MADE-IN-CANADA SOLUTION FOR ISOTOPE DEMAND

Many people remember the isotope shortage that hit Canada and the rest of the world when the NRU reactor at Chalk River was shut down for repairs. The nuclear medicine community heard this as a wakeup call and realized that reliance on a handful of aging reactors for vital medical isotopes is too risky. With the decommissioning of the Chalk River reactor only a few years away, it is clear that a new approach is needed. The Government of Canada challenged the nation's scientists to come up with alternative methods of supplying the country with Technetium-99m, the main isotope produced by Chalk River and used in over 1.8M nuclear medicine procedures every year in Canada.

NATIONAL CYCLOTRON NETWORK

In response to the call, TBRRI partnered with several centres to propose the National Cyclotron Network – a Canada-wide network of medium energy cyclotrons that could create a distributed supply chain to meet all of Canada's isotope needs. The cyclotron coming to Thunder Bay should supply approximately one eighth of Canada's daily Technetium-99m requirements for use in bone, thyroid, brain, stomach, liver, and other applications including cardiac perfusion stress tests.

CYCLOTRON JUST BEGINNING TO REALIZE FULL POTENTIAL

Michael Campbell, TBRRI's Director of Research Operations says, "The new TR-24 cyclotron can easily meet our own nuclear medicine needs and still have capacity to supply isotopes for other sites. But the true potential of the cyclotron has yet to be discovered. We are committed to making sure the cyclotron is used to its fullest capacity and excited about collaborating with researchers from all sectors."

"This is an excellent opportunity for Thunder Bay to take a lead position in the production of medical isotopes for Canada and North America."

Dr. Michael Campbell, TBRRI Director of Research Operations.

Christopher P. Phenix, PhD

TBRRI Scientist – Probe Development and Biomarker Exploration

EDUCATION

Postdoctoral Fellowship, University of British Columbia/TRIUMF, 2009

PhD Chemistry, University of Saskatchewan, 2006

BSc Dual Major, Chemistry and Biochemistry, University of Regina, 2000

APPOINTMENTS AND AFFILIATIONS

Adjunct Professor of Chemistry, Lakehead University

TBRHSF Research Fellow

RESEARCH FOCUS

Positron Emission Tomography (PET) is a powerful nuclear-based imaging technique that allows the functional, quantitative, kinetic, and tomographic (3D) visualization of physiological and biochemical processes. Radiopharmaceutical probes are designed to interact with specific biomolecules (known as biomarkers) that play an important role in a disease process.

Targeting specific biomarkers provides scientists and physicians with vital information for diagnosing, characterization, staging, and treatment of a particular disease. Next generation PET imaging agents are in high demand as personalized medicine begins to revolutionize healthcare.

Dr. Phenix and his team are working to develop new PET imaging agents to enable the functional and diagnostic imaging of disease with a primary focus on cancer. His laboratory research focuses on:

- Chemical chaperones for treatment of Gaucher disease
- Prodrug inspired probes for imaging enzymatic biomarkers
- Mechanisms of Herceptin resistance in HER2 positive breast cancer
- Imaging of enzyme replacement therapy in lysosomal storage disorders

Dr. Phenix's research team receives interdisciplinary training in molecular biology, enzymology, synthetic chemistry, radiochemistry, bioconjugation chemistry, animal biodistribution studies, and PET imaging.

Dr. Chris Phenix

Creating custom radioactive probes

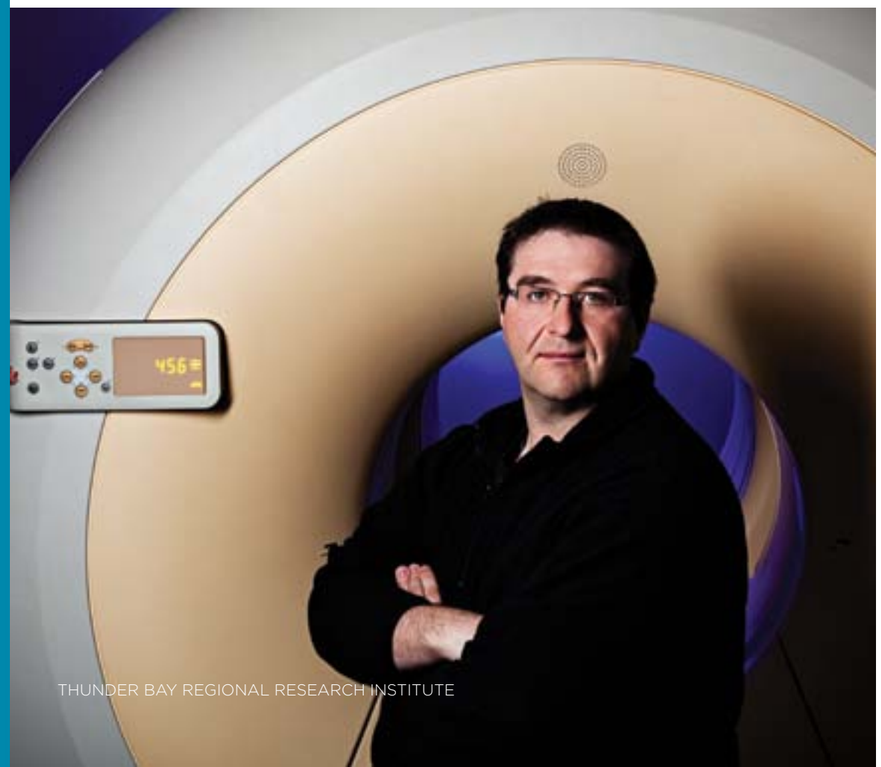
Dr. Phenix's group works in probe and biomarker exploration where one of their focus areas is breast cancer. About 30% of breast cancer patients have too much of a receptor protein that comes from the HER2 gene. Patients who overproduce this protein have higher disease recurrence rates and poor prognosis because these proteins control molecular signals that regulate cell growth and survival.

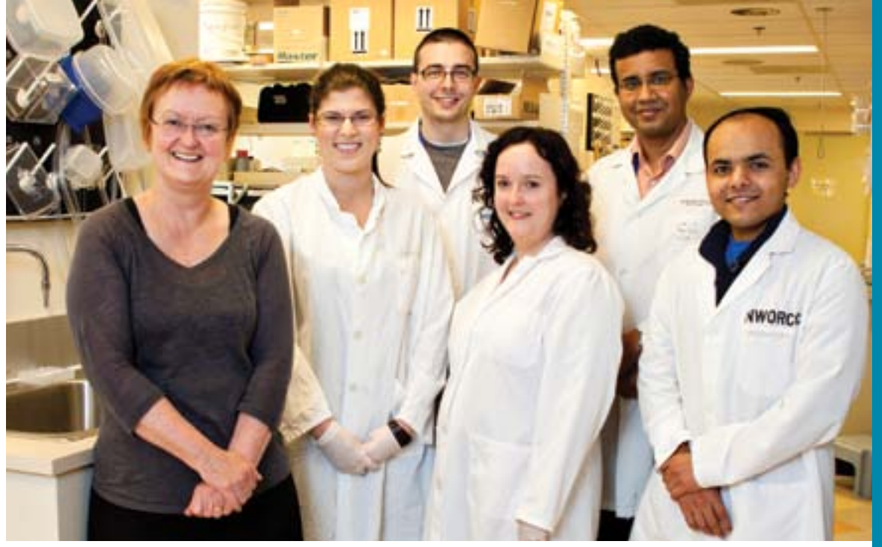
A therapeutic antibody has been developed – Herceptin – that is able to bind to the HER2 proteins and slow or stop the aggressive breast cell growth. Because Herceptin has been associated with cardiac toxicity, it is extremely important that breast cancer patients are tested for HER2 to assess prognosis and to determine suitability for Herceptin therapy because for women with HER2-negative tumours, the risks of Herceptin clearly outweigh the benefits.

Dr. Phenix and his team are creating new custom radioactive probes to discover why some women never respond to Herceptin therapy and to determine why those that do eventually become Herceptin resistant. The probes will enter the body, find the HER2 target biomarker, and light up on PET/CT scans. The precise imaging information will help determine which breast cancer patients will respond well to therapy.

Hopefully, understanding overexpression of receptor proteins in breast cancer will apply to research in ovarian, stomach, and uterine cancer, where the same overexpression occurs.

"Molecular medicine is exciting. It allows scientists and clinicians to target disease at the very fundamental root of biology – at the molecular level."





It's been a winning year for Dr. Ingeborg Zehbe and her research team

Dr. Zehbe was the primary investigator in the first pilot study to systematically address human papillomavirus (HPV) testing based on self-sampling in Aboriginal women in Northwestern Ontario. In December 2011 Dr. Ingeborg Zehbe and her team were recognized for their pivotal work by a Cancer Care Ontario Quality & Innovation Award – one of only four in the province. The annual awards recognize the development of bold new processes, products, or programs that enhance cancer care in Ontario.

Following the successful pilot study that found self-sampling was an embraced screening strategy, the Canadian Institutes of Health Research (CIHR) awarded funds of $600,000 to support expansion of the study to include 1000 women living on-reserve in ten Robinson-Superior First Nations communities.

In the expanded study, Engaging First Nations Women in Cervical Cancer Screening: Assessing Factors Related to Screening and Uptake of Self-Sampling, Dr. Zehbe and her research team will help determine culturally safe approaches to promote increased participation in cervical cancer screening and determine whether a self-sampling test could become a viable screening strategy for First Nations women who live in rural and remote communities.

"Our research focuses on Aboriginal women because they have a 73% higher incidence of cervical cancer compared to women in the rest of Ontario," says Dr. Zehbe, "and Aboriginal women are twice as likely to die from cervical cancer. We hope this study will increase women's curiosity and knowledge about screening, not just for cervical cancer, but for other types of cancer that can be screened and detected early, such as breast and colorectal cancer."

Dr. Zehbe's project is a stellar example of good partnerships. The interdisciplinary study combines the expertise of cancer biologists, virologists, epidemiologists and medical anthropologists from several Canadian universities including University of British Columbia, University of Manitoba, University of Ottawa, and Northern Ontario School of Medicine. The team also includes members of TBRRI and public health care workers from First Nations communities in the region.

DISCOVERY FUND FUELS GLOBAL IDEAS

The Thunder Bay Regional Health Sciences Foundation has a dedicated Health Sciences Discovery Fund that supports bright scientists like Dr. Zehbe. Foundation Chair, Brian McKinnon, says, "Generous donations to our Health Sciences Discovery Fund can advance medical research here in Northwestern Ontario, and around the world."

Health Sciences Discovery Fund
Thunder Bay Regional Health Sciences Foundation

Ingeborg Zehbe, PhD, DSc

TBRRI Scientist – Probe Development and Biomarker Exploration

EDUCATION

BA Anthropology and Archaeology, University of Uppsala, Sweden, 1987

PhD Molecular Pathology, University of Uppsala, Sweden, 1996

DSc Molecular Pathology, University of Uppsala, Sweden, 1999

APPOINTMENTS AND AFFILIATIONS

Associate Professor, Northern Ontario School of Medicine West Campus

Adjunct Professor, Biology, Lakehead University

RESEARCH FOCUS

Dr. Zehbe's research focuses on infectious agents such as bacteria or viruses which have been identified as carcinogens. Her lab is interested in virus-related cancer using high-risk human papillomavirus (HPV) and skin or mucosa as a model.

Previous epidemiological, functional, and structural studies strongly suggest that intratype variants of the E6 oncoprotein lead to diverse cancer susceptibility. Dr. Zehbe's team wants to substantiate this evidence by systematically testing the biological activity of naturally occurring E6 variants.

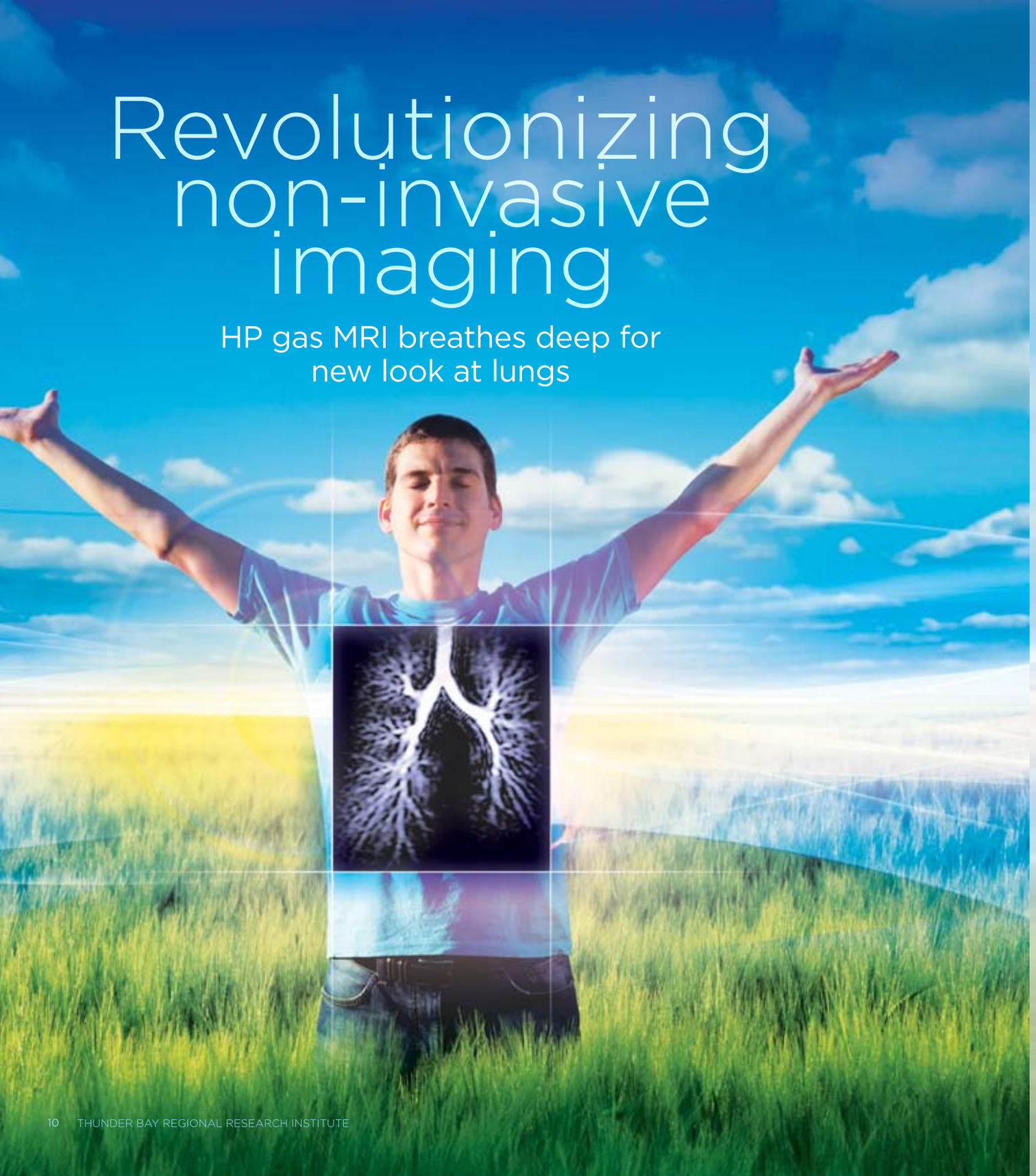
Multi-disciplinary approaches such as global transcriptomics and proteomics, three-dimensional organotypic cultures, animal models, and image-guided technologies are used. This work will substantially advance knowledge in tumour virus research, tumour biology, and tumour immunology. Other projects include the role of a novel interferon in cervical carcinogenesis and integrin receptors as potential targets for therapy. Results will benefit the development and commercialization of biomarkers and individual treatment regimens.

Dr. Zehbe's current research projects include:

- Qualitative HPV screening study
- Cervical cancer screening study of HPV self-sampling in First Nations Women
- Basic DNA tumour HPV virus research (funded by NSERC)
- Two studies that aim to improve the treatment of HPV and cervical cancer, including a preclinical screening and treatment study using High Intensity Focused Ultrasound sponsored by Philips Healthcare, and a pre-cancer treatment in partnership with colleagues in Manchester

Revolutionizing non-invasive imaging

HP gas MRI breathes deep for new look at lungs



"I once had a professor, Dilip Balamore at SUNY, who told me I should look at xenon gas because it had interesting properties that were not fully understood. His advice has borne fruit in unexpected ways — with persistent pursuit, a new diagnostic technology has emerged."

These are the words of Dr. Mitchell Albert, recently recruited scientist at the Thunder Bay Regional Research Institute (TBRRI), Joint Lakehead University/ TBRRI Research Chair, and Professor of Chemistry at Lakehead University. Albert co-invented a powerful new diagnostic technology – hyperpolarized (HP) gas MRI. Since last year, Dr. Albert has assembled and is leading a team who are taking this breakthrough method to the next level by developing new technology that will improve imaging for asthma, Chronic Obstructive Pulmonary Disease, cystic fibrosis, pulmonary embolism, lung and breast cancer, stroke, atherosclerosis, and diseases of the brain.

In a nutshell, HP gas MRI uses the process of hyperpolarization to manipulate xenon gas atoms to enhance MRI signal by 100,000 times. This technique can produce images that delineate, in great detail and clarity, physiological changes occurring in body tissue, including the lungs and brain, which have traditionally resisted conventional MRI. HP gas MRI is non-invasive, avoids the use of ionizing radiation, and is tremendously valuable to medical science.

"I get excited when I can see how this technique can inform treatment decisions for patients," says Dr. Albert. "When I was still working in the United States I had the opportunity to image a 5-year old girl with cystic fibrosis who couldn't perform the only diagnostic test available to her – a pulmonary function test. So we used HP gas MRI and learned that this little girl, who wasn't being treated for her disease because her clinicians thought she was asymptomatic, actually had symptoms and needed treatment."

The ability to visualize lung function with HP gas MRI gave the girl's doctors more information so they could start treatment to improve the quality and length of her life. It's experiences like this that spur researchers to keep looking for better and more innovative ways to meet unmet clinical needs.

Hyperpolarized MRI imaging is poised to become a main-stream diagnostic method to detect, diagnose, and optimize treatment of lung disease, as well as other applications for stroke and cancer.

Mitchell Albert, PhD

TBRRI Scientist –
Advanced Detection Devices

EDUCATION

BSc Experimental Psychology, State University of New York, Purchase, 1985

PhD Physical Chemistry, State University of New York, Stony Brook, 1993

Research Fellow in Radiology, University Hospital at Stony Brook, NY, 1993-1994

APPOINTMENTS AND AFFILIATIONS

Professor, Chemistry,
Lakehead University

Joint TBRRI/Lakehead University Research Chair

RESEARCH FOCUS

Dr. Mitchell Albert, co-inventor of hyperpolarized (HP) gas MRI, is establishing a platform to conduct R+D in HP gas MRI to advance research and commercialize products such as a smaller scale HP gas MRI for broad distribution world-wide.

Dr. Albert, one of an estimated 12 researchers in this space globally, will take hyperpolarized gas MRI technology to the next level by developing a new imaging modality for diagnosis and treatment of breathing disorders such as asthma, COPD, cystic fibrosis, and lung cancer, as well as other diseases including cancer, stroke, and diseases of the brain. HP gas MRI technology is currently used in research labs, but existing MRI scanners can easily be adjusted to measure xenon and helium, making this technology readily and widely available.

Dr. Albert joined the faculties of TBRRI and Lakehead University in May 2011. His research group focuses on developing HP 3He and 129Xe MRI to image ventilation in the airways and alveoli of the lungs. In addition, his group has been developing the use of HP 129Xe MRI to image stroke, to probe for brain injury using xenon biosensors that permit imaging of the distribution of peripheral benzodiazepine receptors (PBR) in the brains of living animals, and to image breast tumours using specific anti-tumour antibodies.

Dr. Mitch Albert, TBRRI Scientist with Respirologist Dr. Birubi Biman in the MRI suite at TBRHSC.

New imaging technique is changing thinking around lung diseases

Readily available, patient friendly, ground-breaking

HP gas MRI technology is currently used only in research labs, but existing MRI scanners can easily be adjusted to image xenon and helium, making this technology readily and widely available once it is approved for use. The potential medical and economic impacts of HP gas MRI are immense.

Thunder Bay Respirologist Dr. Birubi Biman is enthusiastic about the future prospects this research offers for her patients, "HP gas MRI can produce high-quality images that reveal physiological processes that we couldn't see before. This will be a great help in testing and evaluating new treatments."

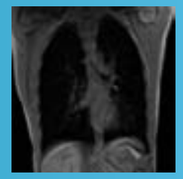
Both Dr. Albert and Dr. Biman are excited by the possibility of testing new drugs that can more accurately target and treat affected areas in the lung. With HP gas MRI, researchers can see immediately if a new drug is having the desired effect, opening air passageways for instance, so that beneficial drugs can make the move to market more swiftly.

"We need more Mitch Alberts to strengthen the Collaborative Health Research Partnership and to advance health research at TBRRI and Lakehead."

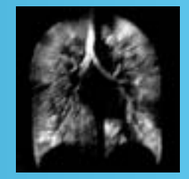
Dr. Rui Wang, Lakehead University's Vice President of Research, Economic Development, and Innovation.

CONVENTIONAL MRI VERSUS HP GAS MRI

Although conventional MRI reveals anatomical features in great detail, it does not depict physiological function. It would be impossible to determine whether the patient in the conventional MRI image had asthma. By using HP gas MRI, which images the lungs by showing where the gas is able to penetrate, we can actually see where areas of the lung are damaged or not functioning. This new imaging modality will help clinicians determine when to treat, how to treat, and what to treat.



Conventional MRI



HP Gas MRI

Research transforms patient care

Cancer is currently the leading cause of death in Canada, stroke is third, and chronic lower respiratory disease is fourth. Advances in imaging technology that can better detect and assist in more effective treatment of these conditions will have significant benefits to our society. Dr. Albert is collaborating with oncologists to optimize radiation treatment for lung cancer using x-ray beam guidance, colorectal cancer screening using HP gas MRI, and breast cancer screening using molecular biosensors that can be imaged with HP xenon MRI. These techniques provide detailed physiological information about how well therapy is working so that oncologists can tailor treatment plans that are more targeted and can spare healthy tissue.

What is the upshot of all this hard work? Earlier detection, better treatment plans, and improved patient outcomes. TBRRI is transforming patient care at TBRHSC as researchers and clinicians work together to develop diagnostic tools and treatments that save lives.

Ontario leads the pack in HP gas MRI

Dr. Albert is one of an estimated 12 researchers globally who are devoted to the study of HP gas MRI, and Ontario is fortunate enough to have three of these top scientists living within its borders. While several locations are performing excellent research – Universities of Virginia and Wisconsin (US), University of Sheffield (UK), University of Mainz (Germany), and others – no region in the world is as fortunate as Ontario to host such a concentration of scientific excellence.

Don't think the government hasn't noticed. With Ontario as the "go-to" place for HP gas MRI, the province recently awarded $1M in funding to offset the cost of establishing a platform to conduct research & development in Thunder Bay. Support was provided for the purchase of a state-of-the-art xenon polarizer to help develop the new technology, translate good ideas to clinical trials, and ultimately commercialize products such as smaller scale HP gas MRI products for broad distribution in Canada and world-wide.

Lakehead University + TBRRI work together

Fostering world-class healthcare research

Dr. Mitch Albert, the first-ever tenure-track research chair of the Lakehead University/TBRRI Collaborative Health Research Partnership, has a foot firmly planted on each side of Oliver Road. He inspires and recruits students in his position as Professor of Chemistry at Lakehead University, while pursuing research as a scientist at Thunder Bay Regional Research Institute. This dual position is the mark of a community committed to building an environment where research and innovation can thrive.

Northwestern Ontario businesses, organizations, and leaders are embracing a burgeoning research, innovation and knowledge-based economy. The rest of the country is beginning to wonder - what in the world is going on up here? Our response: come see for yourself. Mitch Albert did.

Nurturing good ideas

labours of the mind have value

"What is intellectual property? It is a good idea inspired by an unmet patient need that becomes an invention. We patent scientists' discoveries to ensure positive impact for patients and the Institute. TBRRI's sustainability depends on achieving return on investments that support the work of our scientists."

Scott Gillis, TBRRI Director of Business Development and Commercialization

Scott Gillis, BBA, CCPE

TBRRI Director of Business Development and Commercialization

Scott Gillis, a native of Nova Scotia, came to Thunder Bay in August of 2011 as the first Director of Business Development and Commercialization at Thunder Bay Regional Research Institute (TBRRI). TBRRI is a key contributor to Northwestern Ontario's burgeoning medical healthcare sector as it works to advance healthcare through excellence in patient-centred research.

With over 23 years of experience in the pharmaceutical and health industry, Gillis will identify unique business and commercialization opportunities for TBRRI through strategic planning and partnerships. Through TBRRI's membership in MaRS Innovation, Gillis keeps his finger on the pulse of provincial discovery.

During many years spent with GlaxoSmithKline (Canada), Scott was instrumental in creating nine private/public partnerships in chronic disease management in the Atlantic Provinces. Gillis specializes in strategic marketing, chronic disease management, customer management, deal negotiations, and sales management/team building. He holds a business degree from the University of New Brunswick and additional education through the Council for Continuing Pharmaceutical Education and studies at St. Mary's University and the Rotman School of Business.

Scott Gillis represents Northwestern Ontario on the Life Sciences Ontario Board and is a member of the Board for the Northwestern Ontario Innovation Centre.

Paving the way for sustainability

Scott Gillis, TBRRI's new Director of Business Development and Commercialization, is dedicated to ensuring that research results lead to positive impact and technologies in Thunder Bay and globally. By partnering with industry and investors, TBRRI is moving science and technology from the lab to mainstream by licensing discoveries to companies and creating spinoff companies in Thunder Bay.

TBRRI capitalizes on specialized business expertise through its membership in MaRS Innovation, a non-profit commercialization agent supported by the Government of Canada. TBRRI is the only partner outside the Greater Toronto Area and joins 16 members working in the Ontario life sciences industry including the likes of Sunnybrook Health Sciences Centre, Sick Kids, and University Health Network – three of the top ten research hospitals in Canada.

We know that successful commercialization depends on strong leadership, sufficient capitalization, good partners, a strong business plan, and the resources necessary for bringing the innovation to market. TBRRI is working together with MaRS Innovation right now to ensure these elements are in place to bring Dr. John Rowland's X-ray Light Valve (XLV) technology to market. XLV has the potential to provide lower-cost x-rays to masses of people around the world who do not have access now.

"It is my goal to pave the road for our scientists, the Institute, and our region to benefit – socially and economically," says Gillis. "Our focus is sustainable economic development in Thunder Bay and Northwestern Ontario that will lead to improved community outcomes. We are doing good things – and good things take time."

Commercializing a world of discovery

TBRRI shares MaRS Innovation's vision of maximizing the commercial and social return on research investments made by member institutions. Together, MaRS Innovation's members are converting great science into commercially viable products and services that make a significant contribution to Canada's economic outlook and the quality of life of Canadians and others around the world. As MaRS Innovation accelerates commercialization of leading technologies, Ontario is able to attract and retain top talent; strengthen its innovation capacity and competitiveness; create, grow, and retain companies; and incite investment from a variety of sources. On average, its 16 member institutions bring 300+ disclosures to MaRS Innovation annually – a number similar to MIT and Stanford, two US research powerhouses.

Creations of the mind

HOW DOES ESTABLISHING A PATENT LEAD TO COMMERCIALIZATION?

The word patent originates from the Latin patere, which means "to lay open." This form of intellectual property grants a set of exclusive rights to an inventor or their assignee for a limited period of time in exchange for the public disclosure of an invention. During this time, the patent holder can invest in research & development that increases the possibility of technological advances or breakthroughs and bring them to market without danger of exploitation by other parties.

Lily Wu, MD, PhD

TBRRI Scientist – Probe Development + Biomarker Exploration

EDUCATION

MD, Shandong University, PR China, 1982

MSc, University of Alberta, Edmonton, 1991

PhD, Université de Montréal, 1999

APPOINTMENTS AND AFFILIATIONS

Professor, Department of Health Sciences, Lakehead University

Adjunct Professor, Department of Pharmacology, College of Medicine, University of Saskatchewan

RESEARCH FOCUS

Modern diets can cause modern diseases. Research has linked a metabolite of sugar – methylglyoxal (MG) – to the development of diabetic complications. Dr. Wu and her team hypothesize that over-production of MG also contributes to the development of insulin resistance including hypertension, a common life-threatening disease that in 95% of cases has no clear cause.

Dr. Wu's research aims to establish that high levels of MG promote the development of hypertension. Since hypertension may result from diet, her research could lead to new methods for its prevention and management.

Her team also investigates the role of peroxisome proliferator-activated receptor gamma (PPAR gama) in hypertension. More specifically, the correlation between the altered PPAR gama function to the development of hypertension and the correlation between the impaired PPAR gama function to the enhanced vascular contractility in hypertension. This project has the potential to elucidate an important role for PPAR gama in the homeostatic control of blood pressure. In addition, Dr. Wu is interested in the application of natural compounds such as broccoli/berry in the prevention of hypertension and stroke.

Dr. Lily Wu

Creative, collaborative, caring

Our modern diet is causing modern diseases. High-fat, high-sugar foods create many problems within our bodies. Metabolic syndrome – a combination of disorders including hypertension, diabetes, and obesity – is rising dramatically. Nearly one billion people around the world have hypertension and 250 million people live with type 2 diabetes. By 2025, global numbers are expected to increase by over 50%.

Nobody really understands how metabolic syndrome happens, but Dr. Lily Wu has some theories. She believes that when the body processes high-fat, high-sugar foods, it makes side-products like methylglyoxal (MG). MG has been linked to diabetes and might also be a cause of hypertension. Dr. Wu and her team are also investigating a possible link between hypertension and peroxisome proliferator-activated receptor gamma, a type of protein that regulates glucose and fatty acids.

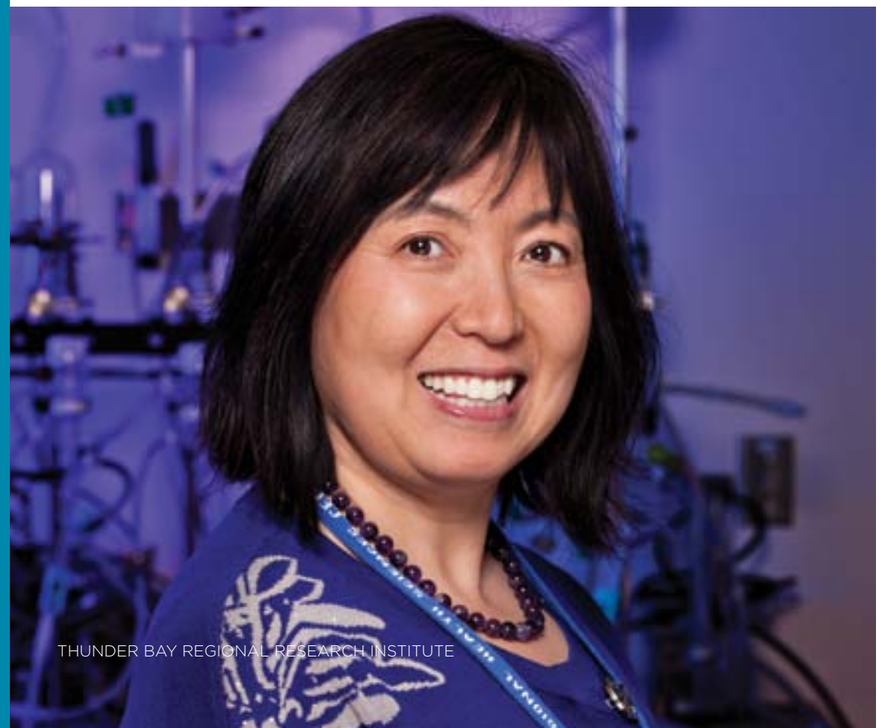
Dr. Wu and her team are working to determine how metabolic syndrome works, and then find ways to treat and prevent it.

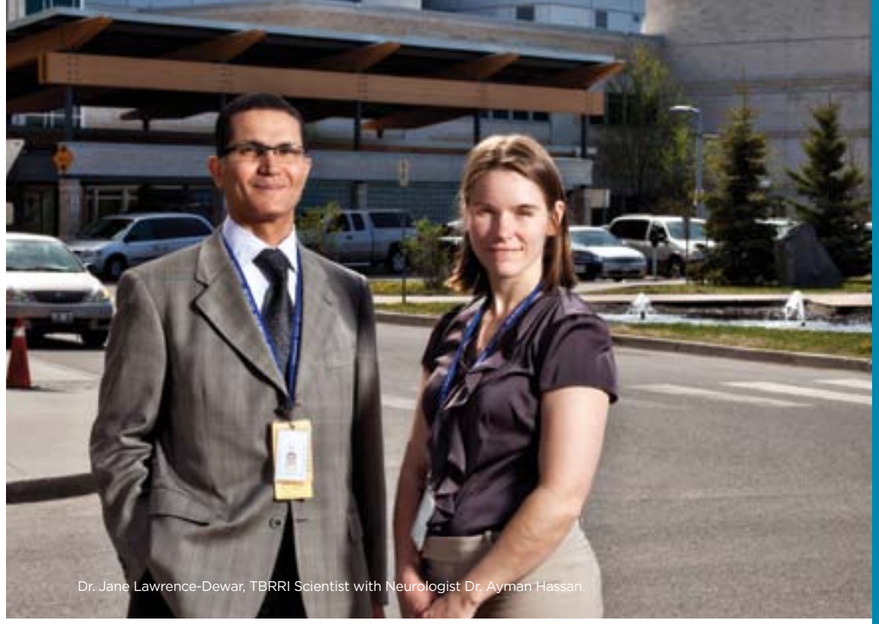
Until a short while ago, Dr. Wu conducted her investigations at the University of Saskatchewan. She is now in Thunder Bay taking advantage of the collaborative research opportunities at TBRRI and is a full professor in the Department of Health Sciences at Lakehead University.

"I was seeking new opportunities to expand my research scope and interests, with an emphasis on bridging laboratory bench research with clinical bedside practice by developing and applying novel biomarkers for different disease situations," Dr. Wu says. She will collaborate with cardiac care professionals like Dr. Chris Lai to bring new treatments and screening approaches to patients through new clinical trials.

Coming from Saskatoon, Dr. Wu appreciates the stellar access to water that living on Lake Superior's north shore offers. But Dr. Wu hasn't had much leisure time lately — this summer, she hopes to have time to read for pleasure with Steve Jobs' biography high on her list. Thunder Bay's lifestyle was a definitive draw for Dr. Wu, but the dynamic research community, partnership opportunities, and ready access to a growing clinical trials program at TBRRI and TBRHSC were the clinchers.

Dr. Wu is happy in her new place. "My joint position at TBRRI and Lakehead University creates an opportune environment for my research and gives me excellent access to bright, passionate students."





Dr. Jane Lawrence-Dewar, TBRRI Scientist with Neurologist Dr. Ayman Hassan.

TBRRI continues to attract outstanding research talent

New scientist focuses on fMRI to target stroke rehabilitation

Dr. Lawrence-Dewar came to Thunder Bay because, she says, "the right ingredients are in place here for a successful research program that allows enormous opportunity for collaboration and partnership." She adds that "with NOSM, Lakehead University, the Health Sciences Centre, TBRRI, and a number of spinoff companies working to commercialize research, I feel that Thunder Bay has a lot to offer a young researcher like myself. From what I've seen so far, the work environment is excellent and dedication to patient need is very high."

Neuroscientists like Jane Lawrence-Dewar are gaining a deeper understanding of the brain through functional Magnetic Resonance Imaging (fMRI) and the pace is furious: each day almost 10 new publications appear in medical and scientific journals around the world. This revolutionary imaging technique is rapidly influencing the practice of medicine at many hospitals, especially in neurology and neurosurgery.

Lawrence-Dewar's research plan at TBRRI will use fMRI to understand how brain reorganization during stroke rehabilitation leads to motor recovery. Her ultimate goal is to use this knowledge to develop better targeted rehabilitation methods and tools for patients who have suffered a stroke.

People are coming to appreciate that fMRI is for mental health like x-rays are for broken bones. fMRI studies have demonstrated, for example, that real physical changes take place in the brain during the treatment of depression. Once technology is in place, TBRRI, Lakehead University, and Northern Ontario School of Medicine researchers can use the fMRI research & development platform to advance their work in areas such as brain injury, pain control, neurosurgical procedures, mental health and addictions, youth suicide, and more.

Local neurologist Dr. Ayman Hassan, is very pleased to welcome an fMRI scientist to Thunder Bay. "Dr. Jane Lawrence-Dewar's research will offer opportunity to learn more about improving patient outcomes with more targeted treatment options and therapies. It will be good to have a researcher like Jane as a member of the team."

She's only just arrived but already Jane is pleased and surprised by her new home, "One misconception I had about Thunder Bay was the size. I thought Thunder Bay was much smaller. What I really enjoy is the small town feel of Thunder Bay in terms of the friendliness of the residents and proximity to nature, but the city still has many amenities that you find in a larger city. I think my family will be happy here."

Jane Lawrence-Dewar, PhD

TBRRI Scientist – Advanced Detection Devices

EDUCATION

PhD Physiology, University of Manitoba, 2007

BSc Biology, University of Winnipeg, 2002

APPOINTMENTS AND AFFILIATIONS

Adjunct Professor, Department of Health Sciences, Lakehead University (pending senate approval)

Research Affiliate, Centre for Education and Research on Aging and Health, Lakehead University

RESEARCH AREAS OF FOCUS

Stroke has devastating consequences for thousands of Canadians each year. Often, patients are left with motor impairments that greatly affect their quality of life. In order to regain hand use, patients must be able to change or correct their motor movements. While stroke injury can impair a patient's ability to perform these adaptations, we now know that the brain has a remarkable ability to reorganize or remap itself and that many patients are able to regain function through rehabilitation techniques. Dr. Lawrence-Dewar will use structural and functional magnetic resonance imaging (fMRI) of the brain and spinal cord to help understand the disruption and reorganization of neural networks in the brain following injury due to stroke and recovering motor control and adaptation during rehabilitation.

Projects that Dr. Lawrence-Dewar will guide include:

- The role of observational learning (mirror neurons)
- Visuomotor adaptation following stroke
- Changes in the neural networks of stroke patients following rehabilitation

Jae K. Kim, MD, PhD, FRCPC

TBRRI Clinician Scientist –
Imaging Guided Interventions

EDUCATION

Fellow, Cardiovascular Tomography (MR,CT), Department of Radiology, Cleveland Clinic Foundation, 2002-2003

Resident, Diagnostic Radiology Department of Medical Imaging, University of Toronto, 1998-2002

Rotating Internship Faculty of Medicine, University of Toronto, 1997-1998

Doctor of Medicine (MD), Faculty of Medicine, University of Toronto, 1995-1997

PhD Medical Biophysics, University of Toronto, 1990-1995

MSc Electrical Engineering, Massachusetts Institute of Technology, 1986-1998

BSc Electrical Engineering, Massachusetts Institute of Technology, 1982-1986

APPOINTMENTS AND AFFILIATIONS

Radiologist, Diagnostic Imaging, Thunder Bay Regional Health Sciences Centre

TBRHSF Research Fellow

Adjunct Professor, Physics, Lakehead University

Adjunct Professor, Systems Design Engineering, University Waterloo

RESEARCH FOCUS

Dr. Kim, TBRRI's first clinician scientist, works as a TBRRI scientist and a Radiologist at TBRHSC – performing diagnostic radiology at TBRHSC and medical research at TBRRI. Dr. Kim is an expert in cardiovascular imaging, musculoskeletal imaging, and magnetic resonance angiography. He is an advocate of the unique patient-centred research focus of TBRRI and a strong promoter of research that leads to commercialization for patient benefit. His research specializes in the detection and characterization of cancer using MRI and optical techniques.

Currently, Dr. Kim is working on a new method to help determine tumour margins in the OR to improve lumpectomy success rates. His optical technique will help surgeons determine – while the patient is still on the operating table – whether the entire tumour has been removed. His Tumour Margin Project will build and test a device that uses high resolution optical sensing to provide a much clearer distinction between healthy and cancerous tissue in the breast.

Dr. Jae K. Kim

Working to improve surgical outcomes for women with breast cancer

Clinician Scientist Dr. Kim is working on the Tumour Margin Project, a new method to help determine tumour margins in the operating room to improve lumpectomy success rates. Although lumpectomies are less invasive than mastectomies for treating breast cancer, it is difficult for a surgeon to tell the difference between tumour and healthy tissue in the breast. A high number of women (10–60%) have to undergo a second surgery to remove cancer cells that are left behind.

Dr. Kim's optical technique will help surgeons determine – while the patient is still on the operating table – whether the entire tumour has been removed. This new technique has the potential to reduce the number of women who need to undergo a second surgery by literally tens of thousands every year in North America alone. It will also likely shorten the time to radiation therapy for many patients after lumpectomy. Thunder Bay women will be among the first to have access to this new technology that will change the way breast cancer surgery is performed – and it's happening in Ontario.

In November 2011, HTX provided $750,000 in funding through the Technology Acceleration Program to Tornado Medical Systems Inc., a TBRRI spinoff company, to support the commercialization of Dr. Kim's research. The device is called the tumour Margin Assessment Machine (MAM). HTX is a provincially supported company that helps emerging and established Ontario-based companies to develop, produce, and commercialize innovative health technologies.

HTX's funding is part of a $3.7M project which includes funding support from the Northern Ontario Heritage Fund Corporation and in-kind contributions from the Thunder Bay Regional Research Institute for development, testing, and clinical studies of the MAM.

Tornado Medical Systems is a growing biomedical engineering company in Thunder Bay with a head office in Toronto — close to the health sciences hub on University Avenue — and a research and development arm in Ithaca, NY, home to Cornell University. Former TBRRI CEO Michael Power compares the emerging medical research market in the city to countries like South Korea, or Israel, which has more US patents than any other counrty in the world.

Dr. Kim emphasizes that collaboration and invention can happen anywhere to turn good ideas into business opportunities that can flourish in a global open market. "With digital communication you can establish yourself anywhere, at any time, and be fully connected. One must always think on a global level," says Kim.

Currently, Dr. Kim is the principal investigator on a TBRRI experimental treatment research trial: Breast Cancer Surgical Margin Assessment with Optical Coherence Tomography (OCT). The trial, expected to take 12-18 months to complete, hopes to improve understanding of the assessment of surgical samples with OCT to improve patient outcomes and reduce financial cost to the healthcare system.

Dr. David Kisselgoff

Clinician Scientist interested in teaching, research and clinical care

What brought a leading-edge medical scientist and clinician, originally from the mountainous Ural region of Russia and a practicing radiologist with several academic positions at teaching hospitals in Jerusalem, to Northwestern Ontario? Opportunity, opportunity, opportunity.

Dr. David Kisselgoff, originally from Chelyabinsk, Russia, known for its steel production, hockey teams and high level education centres, moved his family across the globe to advance patient care through clinical care, research, and teaching. Through a partnership and joint appointment with the Thunder Bay Regional Health Sciences Centre, Thunder Bay Regional Research Institute, and the Northern Ontario School of Medicine, Kisselgoff is able to split his time between clinical radiology, imaging research, and teaching.

"It's a very exciting and unique opportunity to be involved in research, academics and clinical care as one position. It is challenging, and also very rewarding," said Kisselgoff, who loves the natural beauty of Thunder Bay combined with the advanced healthcare, research and academic facilities found here.

Dr. Kisselgoff has a special interest in the imaging of the musculoskeletal system and cancer. His research focuses on the use of MRI-guided High Intensity Focused Ultrasound (HIFU) treatment for cancer, as well as applications related to Diffusion MRI techniques in whole body imaging of cancer patients.

"Here, because I have the opportunity to be both a radiologist and a scientist, I can work to identify patient needs and create solutions," Dr. Kisselgoff says.

To that end, Dr. Kisselgoff is working on an improved Mobile Radiography Unit that would significantly improve the quality of portable radiography unit images. The upgraded system could be installed in areas where physicians need superior information for patients who need to be treated quickly – in Intensive Care or the Emergency Department for instance.

"It's a unique idea, it's innovative and to my knowledge nobody in the world is doing it. It's very practical and it will likely cut costs," says Dr. Kisselgoff. "State of the art technology can be more efficient at providing fast and appropriate care, and for the patient, better quality means fewer images and less exposure to radiation."

David Kisselgoff, MD

TBRRI Clinician Scientist –
Imaging Guided Interventions

EDUCATION

Doctor of Medicine (MD), Chelyabinsk State Medical Institute, Russia, 1994

Residency in Diagnostic Radiology with Board Certification, Hadassah Hebrew University Medical Center, Jerusalem, 2003

Visiting Scholarship in Musculoskeletal Radiology, University of Chicago Hospitals, 2004

Clinical Fellowship in Musculoskeletal Radiology, McMaster University, Hamilton, Ontario, 2007- 2008

APPOINTMENTS AND AFFILIATIONS

Cancer Care Ontario Research Chair

Chief Radiologist, Thunder Bay Regional Health Sciences Centre

Assistant Professor, Clinical Sciences Division, Northern Ontario School of Medicine

RESEARCH AREAS OF FOCUS

Dr. Kisselgoff is interested in imaging of the musculoskeletal and cancer, particularly MSK ultrasounds and peripheral nerve imaging, general and abdominal imaging, and imaging guided procedures including bone and soft tissue biopsy. His research focuses on MRI guided HIFU treatment for disease and cancer, as well as applications related to Diffusion MRI techniques in imaging of cancer patients.

Dr. Kisselgoff, the first clinician scientist to hold a tripartite appointment at TBBRI, TBRHSC, and the Northern Ontario School of Medicine, is working on an improved Mobile Radiography Unit which would significantly increase the quality of mobile radiography unit images. The improved system would offer superior information to physicians, especially useful when patients need to be treated quickly such as trauma or ICU patients.

His unique idea would likely cut costs and provide better quality with fewer images, and less exposure to radiation.

John A. Rowlands, PhD, FCCPM

TBRRI Founding Scientific Director – Advanced Detection Devices

EDUCATION

BSc Special Studies Physics, First Class Honours, Leeds University, 1967

PhD Physics, Leeds University, 1971

APPOINTMENTS AND AFFILIATIONS

Adjunct Professor, Physics, Lakehead University

Senior Scientist, Imaging Research, Sunnybrook Health Sciences Centre

Head of Medical Physics Research, Odette Cancer Centre, Sunnybrook Health Sciences Centre

Professor, Radiation Oncology, Medical Biophysics and Medical Imaging, University of Toronto

Adjunct Full Professor, Electrical and Computer Engineering, University of Waterloo

RESEARCH FOCUS

Medical imaging and physics have been a common thread throughout Dr. Rowlands' research and professorial experience. His most recent contribution to research/practice is a novel optical detector for Positron Emission Tomography (PET) based on avalanche multiplication in amorphous selenium which potentially has the capability to improve the resolution of PET from 10 mm to 1 mm.

Now he is breaking new ground with a research project called the X-ray Light Valve (XLV) – an inexpensive, efficient, and portable alternative to digital X-rays. In 2010, Dr. Rowlands received a prestigious $500,000 grant from the Ontario Institute for Cancer Research (OICR) to assist in commercializing the XLV concept. Under his leadership, TBRRI became the first member outside of the Greater Toronto Area to partner with MaRS Innovation.

Dr. Rowlands guides other projects at TBRRI that include a novel approach to incisionless surgery made possible by the guidance of high intensity focused ultrasound (HIFU) with MRI (magnetic resonance imaging) as a means of treating cancerous tumours deep in the body using heat instead of conventional surgery. He is the creator of an advanced direct conversion flat panel detector that is now used around the world in digital radiography to produce digital mammograms and fluoroscopy.

Dr. John Rowlands

Taking the world by storm – again

In Thunder Bay, Dr. John Rowlands will forever be known as TBRRI's Founding Scientific Director. But he was world-renowned long before that, inventing a flat panel detector that is used around the world in digital radiography. And, if all goes as planned, his greatest invention is yet to come.

X-Ray Light Valve (XLV) is a revolutionary new way to produce X-rays that are much higher quality at a fraction of the cost. This makes the technology ideal for rural and remote communities, not to mention developing countries. "Right now we use costly, cumbersome machines to provide digital X-ray images," Dr. Rowlands said. "By comparison, XLV technology is a fraction of the cost to manufacture, it produces a better image, and it allows more people to have access to digital X-rays."

Currently, the technology is being developed for use in mammography but the ultimate goal is to use if for all types of radiography – an X-ray for the people – in emerging countries like India and China. "When I travelled to India it had a profound impact on me," Rowlands said. "I have been working in this field for 30 years and this is an opportunity to provide X-rays to the masses, many of whom do not have access now."

Inventing X-ray Light Valve technology is one thing, but to benefit people around the world it needs to be tested and then developed into a finished product. XLV Diagnostics, the spin-off company resulting from this innovative research, will bring XLV to market, tapping into the $1 billion spent globally for mammography, and a staggering $10 billion spent in general radiography.

XLV Diagnostics, supported by TBRRI, Sunnybrook Research Institute (SRI), Ontario Institute for Cancer Research (OICR), and MaRS Innovation, has recently received $200,000 in new financing from OICR and the other shareholders.

"This new company is helping to bring XLV to the next phase of commercialization," Rowlands said. "The idea is based on real patient need." And it's all happening here, in Thunder Bay.

> "This new company is helping to bring XLV to the next phase of commercialization. The idea is based on real patient need."

Dr. Alla Reznik

Developing the next generation of digital mammography

Early detection of breast cancer improves chances for survival. But mammography can be uncomfortable, to say the least. That, coupled with worries of radiation-induced breast cancer from annual mammography, might be a deterrent to screening for some women.

Dr. Alla Reznik is hoping to change that. She recently received almost $100,000 from MaRS Innovation to develop a prototype mammography unit that will use new-generation X-Ray Light Valves (XLV) with avalanche multiplication gain. If successful, this will both improve current breast cancer diagnostic capabilities and reduce radiation exposure by up to ten times. More importantly for women, it will be far more comfortable than current digital mammography techniques requiring breast compression.

This project is the next step in what has been a long and successful career for Dr. Reznik. As a PhD student, Dr. Reznik saw first-hand what a difference advanced imaging detectors make when she was working with an experimental imaging technique that found a cancer that conventional tests had missed. Even though she never met the patient, Dr. Reznik says that she was touched by the experience, knowing that the imaging technique potentially saved the patient's life.

Since then, Dr. Reznik has investigated the properties of wide band-gap semiconductors, and she is an expert in photoconducting materials for x-ray and gamma-ray detector applications. Broadly, her current goal is to improve sensitivity of advanced radiation imaging detectors to detect and diagnose cancer earlier, starting with breast cancer. She joined TBRRI in 2008, is a Canada Research Chair in Physics of Molecular Imaging, and an Assistant Professor of Physics at Lakehead University.

"As a researcher I have a couple of inventions, and this makes me happy because I know that my inventions will result in better diagnoses of different diseases for the benefit of Canadian healthcare," Dr. Reznik says. "But, if I'm ever in the position to say I have a true discovery, I will really feel that my life was worth something."

Alla Reznik, PhD

TBRRI Scientist – Advanced Detection Devices

EDUCATION

MSc, Kiev State University, Radio-Physics, Kiev, Ukraine, 1985

Postgraduate courses, Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kiev, 1991

PhD Physics, Technion - Israel Institute of Technology, Haifa, Israel, 2000

Postdoctorate, Medical Biophysics, University of Toronto, 2003

APPOINTMENTS AND AFFILIATIONS

Canada Research Chair in Physics of Molecular Imaging

Assistant Professor, Physics, Lakehead University

RESEARCH FOCUS

Dr. Alla Reznik performs research in advanced photoconductive materials for x-ray and gamma ray detector applications. She works in collaboration with Drs. Rowlands and Rubel, TBRRI; Dr. S. Baranovski, Philipps University, Marburg, Germany; Dr. S. Kasap, University of Saskatchewan, Dr. K. Karim, University of Waterloo and industrial partners NHK Science and Technical Laboratories (Japan), Philips Research Labs (Germany), ANRAD Corporation (Canada), and Weinberg Medical Systems (USA).

Dr. Reznik is working on the development of novel high-gain avalanche amorphous selenium (a-Se) photosensors for use in Positron Emission Tomography (PET) technology using small-animal and breast-dedicated PET imagers. Her research is funded by ORF-RE Round 3 and Round 4 grants with in-kind contributions from ANRAD ($100k) and Weinberg Medical Systems ($100k). Dr. Reznik and her group are focused on improvement in a-Se technology and development of the first prototype of a solid-state a-Se photosensor with metal pixel readout. This is a significant breakthrough in the PET technology.

Dr. Reznik is also involved with Philips Medical Systems (Canada) in the development of next generation digital detectors for fluoroscopic imaging based on lead oxide (PbO) as x-ray-to-charge transducer. Dr. Reznik and her group, with financial support from Philips, installed an advanced evaporation system dedicated to PbO growth and have grown first samples of "Canadian" PbO. First samples of PbO grown at TBRRI have shown improved characteristics (suppressed dark current and increased optical sensitivity) in comparison with PbO grown at Philips Research in Germany.

Patient, clinical trial participant, and a woman who seizes every day

Random act of kindness comes to Cathy Pineau

Cathy Pineau has been living with cancer for 14 years. She was first diagnosed with Stage III ovarian cancer in spring of 1998 (ovarian cancer is often diagnosed at an advanced state because it is relatively slow-growing and has few, if any, symptoms). After surgery and six courses of chemo, Cathy felt lucky to have an eleven year remission.

At the end of Cathy's initial treatment she was offered the chance to be part of a clinical trial. Cathy says, "I jumped at the chance because I had read that people in treatment trials had better experiences because of how closely they were monitored." Dr. Margaret Anthes supervised Cathy's follow-up and provided excellent care and great moral support.

Cathy has great praise both for Clinical Trials and for our Regional Cancer Program. "The Cancer Centre, which in my opinion is one of the best in the province, followed me every 3 months, then 6 months, and eventually, after 10 years of close follow-up, I still receive annual check-ups even though the trial ended years ago."

During those years of remission Cathy resumed her work as manager of the Lakehead Regional Family Centre, welcomed three grandchildren, and began gardening with a passion. "Gardening is so beneficial both mentally and physically," Cathy says with enthusiasm. "How much my passion for gardening kept me cancer-free is impossible to say, although I know for certain that I am physically and spiritually stronger because of it." Her garden reflects her spirit and care: it has been enjoyed on Thunder Bay garden tours and been featured as a contest winner in Gardening Life magazine.

Despite her cancer recurring in May 2009, Jim and Cathy continued to travel to Arizona around her chemotherapy treatments because, Cathy says, "I want treatment, but I still need to live. You have to balance having a life and I made the decision to travel even though cancer was still present. Some time ago, I read an article about a woman living with breast cancer that said 'We don't choose how we're going to die, but we can choose how we are going to live,' and I've made that my own credo."

"I hope that I will have the chance to participate in another clinical trial when and if my current chemo ends," says Cathy, "both as a chance to give back to the Cancer Centre and selfishly, to perhaps improve the chances of extending my life."

A good sign to take home to Cathy

While still in Arizona, Jim and his brother went for a walk – the walk that Cathy and Jim took every day, about 4 miles on lakeside trails. On the way back, Jim spied something hanging from a branch and knew, before he reached up to retrieve it, that it was a Ben's Bell.

BEN'S BELLS

In memory of their beautiful two year old Ben who died suddenly, parents Jeanette and Dean and their 6-year old son Matthew began to make clay wind chimes in their Tucson backyard with friends. Clay therapy was helping, so they made hundreds of Ben's Bells to distribute on the first anniversary of his death throughout their community. Hung in trees, on bike paths, and in parks, the bells contained a simple message: take one home and pass on the kindness.

To date, over 26,859 Ben's Bells have been released but they are not for sale. The only way to get a Ben's Bell is to find one or to be "belled." Each week a person who makes Tucson a kinder place is belled with a Ben's Bell: they are a gentle, beautiful way to remind people how much power they have to make the world a better place – simply by being kind.

They say that people don't just find a Ben's Bell, the bell finds its own way to people in need. And Cathy and Jim know it's true. The odds of Jim finding that bell, on that day, just before returning home to Cathy, were exceptional. The bell, for them, is truly a herald of good things to come.

Even without Jim's careful transport of his bell, Ben's Bells have made their way to Canada. You can find out more about spreading kindness at www.bensbells.org.

Why do people participate in clinical trials?

When asked to identify the largest barrier to increasing patient participation in clinical trials, Director of Clinical Trials Sandra Stoger replied, "People simply aren't asked." Her advice? "Don't hesitate to ask your primary care provider about clinical trials – they're voluntary, you can choose to leave at any time, and participants may experience many benefits."

CLINICAL TRIALS:

- Build in a process called informed consent that teaches people about their condition or disease
- Give participants access to intensive monitoring and follow-up
- Support the advancement of research by expanding knowledge since anyone, including people in good health, can participate in clinical trials
- Make promising new treatments accessible that are not yet widely available to the public
- Offer gravely ill people the chance to get relief where other treatments have failed
- Provide an opportunity for patients to play a more active role in their healthcare

CORE TEAM

Clinical Lead: TBRHSC Chief of Oncology Dr. Dimitrios Vergidis

Scientific Lead: TBRRI Scientist Dr. Laura Curiel

Administrative Lead: TBRRI Katherine Andriash

Management Lead: TBRRI Director of Clinical Trials Sandra Stoger

Medical Director, Translational Research Program: Dr. Christopher Lai

Dr. Laura Curiel and Dr. Samuel Pichardo

Removing the barrier of distance in a shared vision of future healthcare

On November 10, 2010 Sunnybrook Health Sciences Centre and Thunder Bay Regional Health Sciences Centre launched the world's first dual-site High Intensity Focused Ultrasound (HIFU) surgery centre. The two mirror facilities pair a Philips 3T magnetic resonance imaging (MRI) device with focused ultrasound technology.

HIFU is based on the groundbreaking work of Dr. Kullervo Hynynen, director of imaging at Sunnybrook Research Institute and a Canada Research Chair in Imaging Systems and Image-Guided Therapy. Leading the research at Thunder Bay Regional Research Institute are Dr. Laura Curiel and Dr. Sam Pichardo, together with radiologist Dr. Neety Panu and obstetrician and gynecologist Dr. Andrew Siren.

The first clinical trial for HIFU conducted in Toronto and Thunder Bay evaluated the safety of using a Philips MRI-guided focused ultrasound system for treating uterine fibroids: noncancerous tumours affecting up to 50% of women of childbearing age.

WHAT DOES THIS MEAN FOR PATIENTS?
Uterine fibroid treatment is an outpatient incision-less procedure that requires no general anesthetic. Patients go home the same day, and can quickly return to family and work. Sites in Thunder Bay and Toronto are working to bring HIFU access to patients across the province in the near future.

WHAT'S NEXT?
Teams of clinicians and researchers at both Ontario sites are progressing toward trials in breast, bone, head and neck, and rectal cancer. While this work is still at the research stage, the road to patient implementation is getting shorter. HIFU treatment of prostate cancer is an approved therapy in many countries including Canada, and MR-guided HIFU is an approved therapeutic procedure to treat uterine fibroids in Asia, Australia, Canada, Europe, Israel and the United States.

WHAT IS HIFU SURGERY?
High-Intensity Focused Ultrasound is a highly precise medical procedure that applies MR-guided high-intensity focused sonic energy to heat and destroy diseased or damaged tissue. This scalpel-less surgery is revolutionizing medicine as a non-invasive way to destroy tumours.

Ultrasound energy is applied to a specific target in the body, such as a tumour, where it uses heat to cause cell death and destroy the tissue. MR is the "map" used to identify the target, plan the treatment, guide application of the focused ultrasound, and to immediately determine if treatment was successful.

Laura Curiel, PhD

TBRRI Scientist –
Imaging Guided Interventions

EDUCATION
BEng Electronic Systems, Instituto Tecnologico y de Estudios Superiores de Monterrey, Estado de Mexico, 1995

MSc Biomedical Engineering, Universite de Lyon I Claude Bernard, Lyon, France, 1997

PhD Imaging and Systems, Institut National de Sciences Appliquees, Lyon, France, 2001

APPOINTMENTS AND AFFILIATIONS
Adjunct Professor, Electrical and Computer Engineering, Lakehead University

TBRHSF Research Fellow

RESEARCH FOCUS
Dr. Curiel's research is centered in High Intensity Focused Ultrasound (HIFU) therapy. HIFU has the potential for minimally invasive treatments that selectively destroy or interact with cells located in a targeted zone. Her research activities comprise three different directions: new therapeutic devices design, ultrasound lesion formation study, and treatment monitoring.

Her collaborative work with Philips Healthcare, TBRHSC, and Sunnybrook Health Sciences Centre led to the first-ever HIFU clinical trials testing the efficacy of the HIFU device by ablating uterine fibroids under MRI guidance at Thunder Bay Regional Health Sciences Centre.

Dr. Curiel is working to develope HIFU therapy for other disease site such as prostate and cervix. This includes investigation of bioeffects, design of new therapeutic devices, and exploration of different monitoring to achieve the safest and most effective treatment result. During previous research work, Dr. Curiel designed and tested new HIFU probes for prostate cancer, used modeling to improve clinical outcomes, and clinically evaluated elastographic imaging techniques for HIFU treatment evaluation and lesion formation control.

Her research is based on patient need and she is committed to continuous improvement of HIFU as a therapeutic approach with the ultimate aim of translating her research results to clinical practice. TBRRI has complete infrastructure for performing clinical HIFU treatments in an open research environment that will encourage development of new devices within the hospital structure and multiply collaboration opportunities for patient benefit.

Samuel Pichardo, PhD

TBRRI Scientist –
Imaging Guided Interventions

EDUCATION
BEng Electronic Systems, Instituto Tecnologico y de Estudios Superiores de Monterrey, Estado de Mexico, 1995

MSc Imaging and Systems, Institut National de Sciences Appliquees, Lyon, France, 2001

PhD Imaging and Systems, Institut National de Sciences Appliquees, Lyon, France, 2005

APPOINTMENTS AND AFFILIATIONS
Adjunct Professor, Electrical and Computer Engineering, Lakehead University

RESEARCH FOCUS
Dr. Pichardo's research is centred on the use of high intensity focused ultrasound (HIFU) to propose minimally invasive therapeutic applications. Focused ultrasound can concentrate energy inside tissue using a non-ionizing energy delivery. Dr. Pichardo's previous work includes using focused ultrasound to treat superficial venous insufficiency and prostate cancer, new modalities for treatment and imaging of brain tumours, and minimally invasive treatment of atrial fibrillation.

At TBRRI, Dr. Pichardo explores new applications of HIFU for the treatment of cardiovascular and immunology-related diseases. His collaborations with colleagues at TBRRI and abroad include projects for exploring treatment options for cervical cancer, new materials and electronics for HIFU, and treatment planning software development.

He is particularly interested in developing research that balances a good understanding of the basic effects of ultrasound in tissue, laboratory experimentation, and clinical validation. He works alongside clinicians to establish a multidisciplinary environment to encourage and expedite translation of basic research into clinical reality.

Dr. Pichardo is constantly looking for better modeling tools to help scientists and clinicians have more accurate prediction and control of therapy. TBRRI has in-house high performance computing tools fully dedicated to test new models. Effects that are mainly investigated include cavitation, sound propagation in heterogeneous media, thermal effects, and non-linear effects.

Oleg Rubel, PhD

TBRRI Scientist – Advanced Detection Devices

EDUCATION

MEng, Zaporozhye State Technical University, Ukraine, 1997

PhD Material Science, Zaporozhye State Technical University, Ukraine, 2001

APPOINTMENTS AND AFFILIATIONS

Adjunct Professor, Physics, Lakehead University

RESEARCH FOCUS

Dr. Oleg Rubel's research focuses on computational material science with an emphasis on compound semiconductors and nanostructures for optoelectronic applications, including disordered semiconductors for solid-state radiation medical imaging detectors. His research helps to establish a relation between structural properties and transport, electronic, or other properties that are critical for detector performance.
His current research project, Microscopic Theory of High-Field Transport in Disordered Semiconductors, is funded by an Individual Discovery Grant from the Natural Sciences and Engineering Council of Canada (NSERC) of $150,000. The project brings the general idea of computer-aided material design to a practical application.

Instead of using a traditional "trial and error" approach to material design, this research takes the opposite approach by first determining the material requirements and then determining the atomic structure that provides the target properties. This method greatly reduces the cost of developing new materials that will assist in the improvement of existing technologies.

Dr. Rubel and collaborators Dr. Rowlands, Dr. Reznik, and Dr. Kasap (University of Saskatchewan), believe this research program in the long-term will be the "seed" of a computer-aided material design group in Canada, with emphasis on development of new approaches to simulation and invention of new materials for solid-state radiation detectors. Eventually, the research hopes to drastically improve sensitivity of detectors to allow for reduction in radiation dose to patients and, by lowering the cost of imagers, reduced healthcare disparities.

Dr. Oleg Rubel

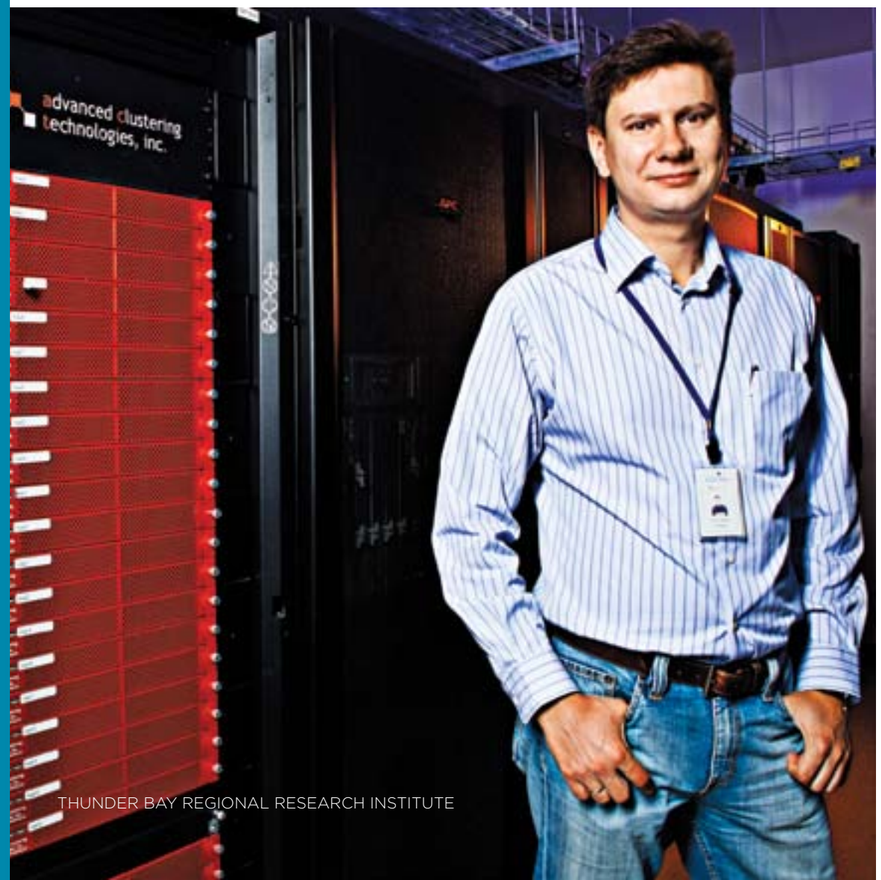
Developing complex computer simulations for material design

What if the Wright brothers had the ability to design a computer model of their airplane before they built and tested it? Not only would this reduce the trial and error required (not to mention danger to their lives), but it would also reduce time and costs. Of course, that wasn't possible in 1903. But it is possible in 2012. Dr. Oleg Rubel and his team are trying to do just that by developing new materials for imaging technologies using very complex computer simulations.

On a basic level, image scanners have two main parts: an energy source – like X-rays, for example – and a way to capture that energy – film, or more likely, digitally. But what if there was a new material out there that is so sensitive, you could reduce the amount of X-rays needed to get a high-resolution image? That would be safer for patients but developing and testing this new sensitive material the old-fashioned way would take years and be very expensive. Dr. Rubel hopes to do most of that trial and error in a computer simulation, saving time and money. This new approach would be an invention in itself, and could be the start of a computer-aided material design group in Canada.

Dr. Rubel earned his first degree in Engineering at the Zaporozhye State Technical University in his home country of Ukraine. He took a strong interest in research, and went on to earn his doctorate in Material Science. Following graduation, he researched a wide range of projects at Philipps University in Marburg, Germany. After working with TBRRI during a joint venture, Dr. Rubel eventually joined the TBRRI team in 2008 in Thunder Bay where he can also pursue his teaching passion as an Adjunct Professor at Lakehead University.

"Research is not an individual discipline," he said. "We need to share our ideas and encourage strong students in order to enhance our position as pioneers and build the knowledge base in our area."



Wely B. Floriano, PhD

TBRRI Scientist – Probe Development and Biomarker Exploration

EDUCATION

BSc Chemistry, Universidade Federal do Rio de Janeiro, Brazil, 1998

MSc Physical Chemistry, Universidade Federal do Rio de Janeiro, Brazil, 1992

PhD Physical Chemistry/Computational, Universidade Federal do Rio de Janeiro, Brazil, 1998

APPOINTMENTS AND AFFILIATIONS

Associate Professor, Chemistry, Lakehead University

SHARCNET/BRI/TBRRI Molecular Simulation Research Chair

RESEARCH FOCUS

Dr. Floriano's Probe Discovery Platform (PDP) applies Computer-assisted Molecular Design techniques traditionally used in drug discovery to screen chemicals looking for "hit" compounds that may be developed into detection agents, probes for medical imaging, medicinal drugs, or regulators of biological activity.

The PDP computationally screens a large (100,000+) database of chemical compounds against a target protein. Selected "hit" compounds are tested to confirm binding to a target protein. The PDP is currently being applied to the therapeutic botulinum toxin, and the oncogenic protein E6 from human papillomavirus variant 16 (HPV16 E6). The botulinum toxin project is expected to generate probes for biodistribution studies and guided application. The HPV16 E6 project is expected to generate optical imaging probes for non-invasive low cost risk assessment, and image-guided preventive treatment of cervical cancer.

As part of the Biorefining Research Initiative, Dr. Floriano is developing a database of biorefining-related chemical compounds that are directly extracted from biomass, are by-products of biorefining processes, or are chemical derivatives of extractives and by-products. The PDP hopes to discover new applications for special-use chemicals that come from biomass and biorefining processes that will bolster the economic viability of lignocellulosic biorefineries and fuel the growth and sustainable development of Northern Ontario.

Dr. Wely Floriano

Computer technology helps break ground in cancer prevention

Dr. Wely Floriano wears many hats. She is a member of the Biorefining Research Initiative, a TBRRI scientist, and a SHARCNET (Shared Hierarchical Academic Research Computing Network) Research Chair who, in one of her projects, uses SHARCNET computational tools to study proteins related to the human papilloma virus (HPV).

Because the HPV virus can eventually lead to cervical cancer in some women, Floriano's work aims to discover an optical imaging probe that would allow cervical cancer to be detected early – before the disease fully develops. The probe is a fluorescent compound that could detect and target a protein – produced by HPV – that acts as a biomarker for cervical cancer. After applying the fluorescent probe, a colposcopist could image the cervix with a low-light or high resolution camera attached to a colposcope to identify tissue at high risk of developing cancer.

"Using a probe to identify high-risk areas prior to development of the cancer is important for improving prognosis for treatment, and will allow doctors to provide preventative treatment for patients," says Floriano. "An optical imaging probe that could detect cervical cancer would be a major advancement in preventing HPV-related cervical cancer."

Her first step is finding a fluorescent chemical compound that can detect the target protein. Using a computer program, Floriano screens a large database of chemical compounds against the target protein to determine which chemical compounds interact most effectively. Successful compounds are then tested experimentally to confirm target protein binding. Using a combination of computational and lab work, an experimentally confirmed "hit" can be developed into an imaging probe.

Floriano's research team uses sophisticated computer programs to learn more about chemical compounds and how they can be applied to advance modern medicine. "Starting research projects with a computational approach is fast and efficient," says Floriano. "Initial lab work can be time consuming, but with computer technology, only the most promising compounds need to be tested experimentally."

SHARCNET provides researchers with access to sophisticated computational resources typical to large pharmaceutical companies, so Dr. Floriano and others can tackle major medical projects that have significant benefits for large populations, like a non-invasive risk assessment test for cervical cancer in HPV patients.

Article written with content supplied by Rebecca Hannam as part of Students Promoting Awareness of Research Knowledge (SPARK) at the University of Guelph Office of Research

Engaging Students, Community, Partners + Physicians

SUMMER SCHOOL OF MEDICAL IMAGING & SEMINAR SERIES

For the third summer, TBRRI is launching another exciting edition of the Summer School of Medical Imaging. Students from Lakehead University, Northern Ontario School of Medicine (NOSM), and TBRRI enroll in a truly multidisciplinary learning environment.

From June to August 2012, scientists will deliver expert talks aimed at summer and graduate students that will cover a wide range of topics in medical imaging. As part of the series, students present their research projects — a valuable opportunity to gain presentation experience and feedback. Several high-profile speakers from other institutions across Canada will also present.

TBRRI STUDENTS HELP BRING DISCOVERY TO LIFE

Thunder Bay Regional Research Institute's success is fueled by a steady stream of bright, young people with energy and ideas who can turn physics, engineering, and other scientific concepts into medical technology.

Every year more than 10 graduate level students are attracted to Lakehead University for the opportunity to work with TBRRI scientists as they pursue careers in medical sciences. PhDs and post-doctoral fellows often begin their scientific careers at the Research Institute. In addition to research grant funding, economic development funding programs such as those offered by NOHFC and FedNor have allowed TBRRI to create more than 50 hands-on, developmental opportunities for high school, undergraduate and graduate students.

TBRRI SPONSORS NORTHWESTERN ONTARIO REGIONAL SCIENCE FAIR

In May, 150 students from Thunder Bay and the surrounding region participated in the Northwestern Ontario Regional Science Fair. The Fair provides an important platform for students to share their discoveries and innovations with local professional and academic experts.

TBRRI AND LAKEHEAD UNIVERSITY HOST THE GAIRDNER FOUNDATION LECTURE

TBRRI joined Lakehead University to celebrate some of the most intriguing and successful research and innovation initiatives taking place during the City of Thunder Bay proclaimed Research and Innovation Week including the third annual Gairdner Foundation Lecture.

Dr. Robert Hegele, Director, Blackburn Cardiovascular Genetics Laboratory, London Regional Genomics Centre at Robarts Research Institute, is a geneticist interested in heart disease and diabetes with a particular interest in northern populations, presented Diabetes: Nature or Nurture? High school students came from around the region for a morning talk as part of the Gairdner's student outreach program, while clinicians, researchers and others heard Dr. Hegele at a professional lecture in the afternoon.

This presentation is part of the acclaimed Gairdner Foundation National Program which aims to communicate the work of medical researchers to others. Recent Canada Gairdner awardees, along with awardees from years past, visit universities across Canada to deliver expert lectures to youth and others.

LAKE SUPERIOR MEDICAL IMAGING WORKSHOP

In September 2011, TBRRI hosted its second International Workshop on Advanced Technologies for Radiation Medical Imaging. Co-chaired by Dr. John Rowlands and Dr. Alla Reznik, the workshop encourages partnerships to design, develop, and commercialize the next generation of medical technologies and imaging detectors. The workshop attracted 45+ participants from Canada, the United States, and Europe.

TBRRI HOSTS ITS FIRST CIHR CAFÉ SCIENTIFIQUE: HOW TO STAY YOUNG? NOVEL APPROACHES TO AGING

In January 2012, TBRRI hosted its first Café Scientifique - a free public event that provides expert insight into health-related issues of popular interest, provokes questions, and provides answers. How to Stay Young? Novel Approaches to Aging highlighted Canadian research that shows we may be able to slow the rate at which we age by modifying our life styles and reducing exposure to environmental factors that promote aging.

SCIENTIST WINS PRESTIGIOUS NEW AWARD FOR HIS INSPIRING WORK WITH STUDENTS

Samuel Pichardo, TBRRI scientist, was awarded the Mark Poznansky Student Mentorship Award for demonstrating outstanding enthusiasm for student engagement. Since 2009, Dr. Pichardo has trained and mentored many students at TBRRI. The award is sponsored by RBC Royal Bank and provides $25,000 toward the stipend of a graduate student, postdoctoral fellow, or other full-time research trainee. "These students will become the scientists of tomorrow, so it's very exciting to work with them now," says Dr. Pichardo.

INSPIRING CAREERS IN MEDICAL RESEARCH

On September 23, 2011, TBRRI, the Ontario Genomics Institute, and Lakehead University teamed up to host Careers in Medical Research. The event attracted over 100 local high school students who participated in table discussions and interactive activities.

Health Sciences Discovery Fund: A Tradition of Local Research

What is healthcare without research?

The Thunder Bay Regional Health Sciences Foundation – through the gifts of our generous donors – helped establish medical research in Thunder Bay, funding lab space and providing grants for our scientists. In a very short time, our world-class and innovative research community has grown from a few scientists to 14 as of 2012.

Scientists like Dr. Ingeborg Zehbe, who has been a researcher here since before TBRRI was formed. The Health Sciences Foundation (then the Northern Cancer Research Foundation) provided Dr. Zehbe with a grant in 2006 to investigate the role of tumour viruses in the development of cancer, using HPV and cervical cancer as the model.

Her work has led to developing what is essentially a home HPV self-screening test for First Nation women, who either do not have access to Pap smear services or who may not feel comfortable taking the test. This is especially important since First Nations women have a 73% higher incidence of cervical cancer compared to women in the rest of Ontario.

The Health Sciences Discovery Fund continues the tradition, and every donation helps. Together, we are creating the future of healthcare.

Health Sciences Discovery Fund
Thunder Bay Regional Health Sciences Foundation

Funders and Partners

COLLABORATION FOR SUCCESS

TBRRI works hand-in-hand with crucial key partners including corporate member organizations, academic, healthcare, industry and research partners. Together we bring discovery to life and move molecular imaging and advanced diagnostic care forward. Bringing new advances to patients is our mutual mission.

Thunder Bay Regional Health Sciences Centre
Lakehead University
Thunder Bay Regional Health Sciences Foundation
Confederation College
Northern Ontario School of Medicine
Sunnybrook Health Sciences Centre
OICR Ontario Institute for Cancer Research
PHILIPS sense and simplicity
Thunder Bay CEDC Community Economic Development Commission
Canada FedNor
tornado medical systems
Northwestern Ontario Innovation Centre
cpdc Centre for Probe Development and Commercialization
Ontario
Ontario Cancer Care Ontario Action Cancer Ontario
City of Thunder Bay Superior by Nature
放送技術研究所 Science & Technology Research Laboratories
HOLOGIC®
XLV Diagnostics Inc.
MaRS Innovation

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Former Department Head, Medical Genetics, University of Toronto
Former Chief of Genetics, Hospital for Sick Children
Former Director of Research, Samuel Lunenfeld Research Institute

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Member of the Order of Australia
Dean, Chief Executive Officer, and Professor of Rural Medicine, Northern Ontario School of Medicine

Dr. Rui Wang, MD, PhD, FAHA
Vice-President Research, Economic Development & Innovation
Professor of Biology Lakehead University

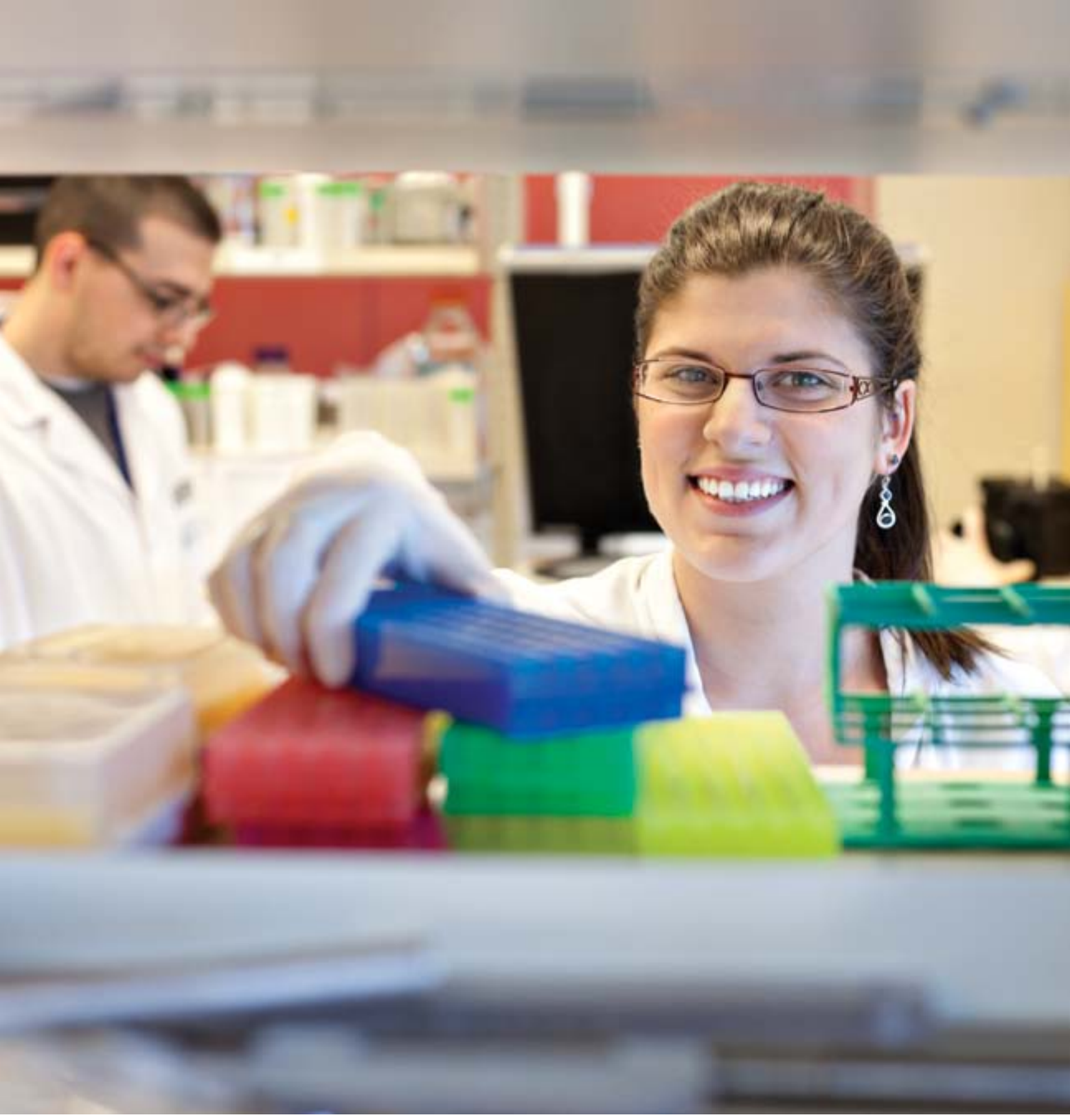
Dr. Michael Wood, PhD
Chief Executive Officer, TBRRI
Vice President Research, Thunder Bay Regional Health Sciences Centre
Professor, Northern Ontario School of Medicine

Michael Gourley
1946-2012

On Friday, March 2, 2012, after an extraordinary and fulfilling life, Michael Gourley passed away at Toronto General Hospital.

Michael was truly blessed and enjoyed a wonderful life with his wife and family. He also took great joy in helping many people and organizations achieve success throughout his outstanding career in the private and public sectors. Passionate about innovation throughout his life, he continued as a member of the Board of Directors of the Thunder Bay Regional Research Institute until his illness overcame him.

Michael will be missed.



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