



annual report 2020⁺



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This has been a transformative year for the Nova Scotia Health Research and Innovation team and an unparalleled one for the province of Nova Scotia. I am proud to share with you our progress and achievements in this year's Annual Report. The vision that started a year ago with the development of our strategic directions has become a reality. This has been made possible through the strength of our key partnerships and solid support from like-minded health care leaders and decision makers throughout the province. It is also a testament to our collective commitment to discover new and innovative ways to advance health care.

Faced with the COVID-19 pandemic, the Research and Innovation team pivoted focus to address the health needs of Nova Scotians in this unprecedented time. Our research communities mobilized to lead world-class COVID-19 research here in Nova Scotia and at Nova Scotia Health. We innovated to meet local demand for Personal Protective Equipment (PPE), we restructured clinical practices to embrace virtual care, and we funded a portfolio of research projects and conducted rapid reviews to inform our path forward. With COVID-19, we began to chart new territory – thinking differently, partnering differently, and mobilizing rapidly. Change is the operative word and this new perspective will lead the way toward transforming health care delivery in Nova Scotia and beyond.

Although COVID-19 efforts continue, the NSH Research and Innovation team will ensure that our mandate and portfolio continues to evolve and grow. In September 2020, the R&I Team will officially launch its first strategic directions and operational plan. This roadmap yields goals and deliverables that have been streamlined to provide tactical and

precise direction. Together, we will deepen our impact via collaboration, build a strong Research and Innovation culture across Nova Scotia, and increase the capacity to lead excellence in research and innovation. You will learn more about our approach in this report and how our Health Innovation and Discovery Hub will be a catalyst for this work.

Here we share a snapshot of our success stories from this year for the Research and Innovation team and our many partners. We are featuring a first of its kind Point of Care MRI, a world first innovation in hip preservation, improved survival rates for head and neck cancer surgery, and cutting edge research that has been leveraged to improve atrial fibrillation care. We are also looking ahead at becoming the world leaders in precision radiotherapy and provincial expansion of research through key partners outside of Central Zone. I am excited to harness the energy of our team and our partners as we continue to deliver on COVID-19 priorities, launching our operationalized strategic directions plan, and ultimately living out our vision to transform health care for the benefit of all Nova Scotians.

Your sincerely,

Dr. Gail Tomblin Murphy
Vice President
Research, Innovation & Discovery and CNE



Our Mission+

We lead and facilitate research and innovation excellence to improve the health of Nova Scotians

Our Vision+

We transform health and health care through research and innovation

Our Goals+

Three goals will guide our activities over the next five years:

- Deepen our impact via *collaboration*
- Build a strong R&I *culture* across Nova Scotia
- Increase the *capacity* to lead excellence in research and innovation

Nova Scotia Health is uniquely positioned to execute on the achievable task of becoming a Maritime hub of innovation, research, and discovery. With a rich research network and a committed roster of partners, NSH has the foundation to become an enviable player in the research and innovation ecosystem.

An exceptional idea, starts with exceptional leadership

Stepping into the role of Vice President of Research and Innovation in late 2018, Dr. Gail Tomblin Murphy immediately identified an opportunity to elevate NSH by driving a culture of research and innovation. Gail's commitment was to build a new culture that would foster a spirit of inquiry, creativity and ingenuity needed to address our most pressing healthcare concerns.

Knowing that collaboration was key to achieving sustainable change, Gail executed on two fronts. The first milestone was to harness the strength of strategic partnerships, alliances and networks by creating a network of partners. These powerful relationships with the government, funders, innovators, and industry partners played a key role in the development of a focused and impactful mandate for the portfolio. The second milestone was to establish a dynamic and skilled team within NSH to advance the research and health innovation agenda in a progressive manner.

Bridging Research and Innovation

In order to execute on this ambitious mandate, it was necessary to bring research and innovation together in a way that allows for each respective sector to complement and enhance the work of the other. The ability to drive innovative and commercial opportunities stemming from research projects, or likewise, the ability to leverage new technologies in a manner that can be evaluated and monitored; the two are inextricably connected.

And so, the Health Innovation & Discovery Hub was formed.

The Health Innovation & Discovery Hub (the Hub) is the first of its kind in Atlantic Canada and provides a center of excellence for health research and innovation. The Hub is an agile, adaptable, and creative space where researchers, multidisciplinary clinical teams, partners and investors are encouraged to come together to create, launch, and commercialize solutions for the betterment of Nova Scotians.

The value of the Hub and its positioning within NSH is to pair leading researchers and clinicians with entrepreneurs to create solutions that will propel healthcare in Nova Scotia to new heights. This impactful goal will underpin and unite the motivation of partners engaged in health research across Nova Scotia. The Hub reflects a renewed spirit of collaboration with partners and our desire to build capacity in the health system.

Ambitious goals require a skilled team

With an accomplished team of senior directors, directors, and an evaluation scientist, the Health Innovation and Discovery Hub is poised to lead health innovation in a structured and sustainable framework that will translate into better health, novel medical technologies, problem-solving contributors, and economic benefits.

To do this, a strong leadership team of experienced professionals was recruited. Skilled researchers, those with deep industry and intellectual property expertise, venture capital experience, and firsthand experience in major Canadian health systems, are all attributes that shape this talented group of leaders. The forward momentum is unstoppable when coupled with our team of nearly 40 professionals who bring deep-rooted institutional knowledge and subject matter expertise honed by decades of real-world experience.

Together, we embark on the exciting task of building the Health Innovation & Discovery Hub that delivers impactful and sustainable change for all Nova Scotians



Gail Tomblin Murphy, PhD
Vice President, Research,
Innovation & Discovery and CNE



Jordan Warford, PhD
Senior Director, Research



Doris Grant
Senior Director, Innovation



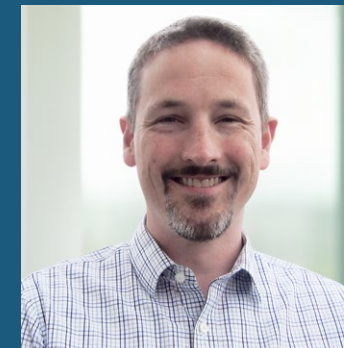
Tara Sampalli, PhD
Senior Scientific Director



Kelly Reinsborough
Director, Innovation



Brittney MacKinnon
Director, Business Development



Adrian MacKenzie, PhD
Director, Research



Nancy Carter, PhD
Evaluation Scientist



Research & Innovation⁺ COVID-19 Response

In collaboration with our partners, the Research and Innovation team quickly responded to the COVID-19 pandemic by successfully executing on the following:

ESTABLISHING A RESEARCH REGISTRY & COALITION

The landscape of the Nova Scotia research community was significantly impacted by COVID-19. There emerged an immediate need to commence new studies related to COVID-19 research. The NSH Research & Innovation team leapt into action, partnering with the Division of Infectious Diseases, and creating a research registry of all COVID-19 studies launching across the province including those from partners the IWK and Dalhousie University. The objective was to promote cross collaboration between studies, creating and enhancing partnerships with industry, and helping researchers navigate the launch of their study in an expedited fashion.

The next key step was partnering to secure funding to make these COVID-19 studies a reality. The Nova Scotia COVID-19 Health Research Coalition was facilitated by NSH Research & Innovation in partnership with the Dalhousie Medical Research Foundation, the QEII Health Sciences Centre Foundation, Dartmouth General Hospital Foundation, the IWK Foundation, Dalhousie University, and Research Nova Scotia. More information about the Nova Scotia COVID-19 Health Research Coalition is included in this report.

SOURCING & CREATING PERSONAL PROTECTIVE EQUIPMENT (PPE)

The COVID-19 pandemic and the global shortage of PPE led to a critical need for locally produced PPE and medical supplies. As procurement teams struggled to meet the growing demands for these supplies and anticipated disruptions in the global marketplace, a dedicated interdisciplinary team of partners was assembled under the leadership of the NSH Research and Innovation team.

The group was called the Skunkworks Team, which by definition is a structured group of people who research and develop a project primarily for the sake of radical innovation. It consisted of a strong and talented group of leaders representing various sectors across Nova Scotia, brought together to address the PPE needs for NSH, IWK, and the needs of the private sector. The team successfully collaborated and sourced local solutions that were produced quickly and in a cost-efficient manner. The Skunkworks team members come from NSH Research & Innovation, IWK, Dalhousie University, ACOA, Engenuity, NSBI, Ignite Atlantic, and BioNova. This collaborative partnership remains active as we maintain vigilance and monitor epidemiological forecasts.

The Skunkworks Team has had many successes in a short timeframe and will have an important and lasting impact on the province and the Atlantic region. The team has reduced dependency on international PPE supply chains and has bolstered the provincial economy by supporting and encouraging existing Nova Scotia and Atlantic businesses to stretch their capabilities far beyond their original mandate.

Ultimately, the Skunkworks team has facilitated a sustainable model for designing and manufacturing products locally with competitive pricing.

LAUNCHING VIRTUAL CARE SOLUTIONS PROVINCE-WIDE

The emergence of COVID-19 highlighted the immediate need for virtual care solutions in the Province of Nova Scotia. Everyone's top priority was the ability for patients to be safely and effectively monitored at home, the ability for surgeons to follow-up with patients and track recovery remotely, and support primary care physicians.

In only a few short months the Research & Innovation team and Information Management and Technology team partnered with industry and government to execute on the delivery of TELUS Home Health Monitoring solutions deployed to Nova Scotians. This service provides patients with secure and reliable care from the comfort of their own homes.

The Research & Innovation Team also collaborated with the orthopedics team to engage local start-ups to deliver on key facets of care for patients on waiting lists or recovering from knee surgery. As this project continues to grow and traditional processes and technologies are modernized, it will have a sustainable and profound impact on the way care is delivered.

Lastly, through intense and focused collaboration with many industry partners, NSH will launch a globally renowned and validated virtual care platform. In conjunction with the NS Department of Health & Wellness, the IWK, and Service Nova Scotia, the feasibility of a modern and accessible virtual care

solution to be rolled out province-wide throughout 2020 is being determined. This transformative project will provide a platform on which virtual services can be delivered by clinicians – regardless of clinical specialty or geography – now and into the future. This truly revolutionary offering for Nova Scotians will forever change the landscape of health care.

INTEGRATING EVIDENCE INTO PLANNING WITH RAPID REVIEWS

Within days of mobilizing NSH's Emergency Operations Centre (EOC), we knew the COVID-19 pandemic presented a unique challenge for planning and policy-setting as information evolved hourly. Research & Innovation responded by harnessing our Rapid Evidence Review team and conducted 55 reviews in just over two months on topics such as PPE, long term care, home care, caring for those who are homeless, pregnancy, flattening the COVID-19 curve and planning for non-COVID-19 care, to name a few. The team was comprised of embedded scientists from the Research & Innovation portfolio, Research Methods Unit, academic partners and a multidisciplinary team of learners.

These reviews informed planning, response and policy development during COVID-19 in a patient-focused way and 10 reviews have spawned ideas for new research projects. The collective impact of this work has been felt across the province at all levels of government. We will continue to build on the momentum of ongoing projects to ensure our communities emerge from COVID-19 stronger and with a new appreciation for the power of research to affect change.

To view the Rapid Reviews [please click here.](#)

Research & Innovation COVID-19 Response by the Numbers



\$1.5M

raised in 1 week with a rapid call to researchers that resulted in

262

applications
within 4 days



1700

community offers via
PPE email address

100⁺

companies engaged
across Atlantic Canada



100⁺

companies reviewed
in market analysis

75⁺

partners engaged



55

rapid evidence reviews conducted on priority topics identified by EOC, Executive Leadership Team and clinical and program leads

10

research projects as COVID-19 learning opportunities

Coalition Funded Projects

The Coalition's funding will support COVID-19 research that will inform health system decisions, facilitate vaccine development, identify novel treatments, develop devices, and influence social response to the pandemic. Funding will also leverage existing research capabilities to help rapidly respond to the urgent need to support further COVID-19 focused research right here in Nova Scotia.

We have highlighted 5 of the 40 grants awarded. To view all projects, [please click here.](#)

DR. LISA BARRETT

This study aims to better understand COVID-19 immune disruption and reversibility by examining global and SARS-CoV-2 specific immune dysregulation before, during and after therapy.



DR. STEPHEN BEED

This study will develop and test a device to aid the safe repositioning of critically ill, heavily sedated, intubated, and/or pharmacologically paralyzed COVID-19 patients.



DR. ASHLEY MILLER

This study will evaluate, refine, and implement a virtual patient-centered platform to guide COVID-19 patient care in the community, and examine clinical predictors of COVID disease progression.



DR. RATIKA PARKASH

This study will investigate the degree to which Nova Scotia's COVID-19 pandemic response has affected morbidity and mortality in patients with known or new onset cardiovascular or neurovascular disease.



DR. KENNETH ROCKWOOD

This study will investigate how differences in frailty and fitness among people being assessed for COVID-19 are related to the development, progression, and outcomes of the disease.



COVID-19 + Coalition

On March 22nd, when the Province of Nova Scotia declared a state of emergency to address the global pandemic, it was clear that COVID-19 was a concern for Nova Scotians. How would they protect themselves and their loved ones? What would happen if they got sick? What about their jobs and their incomes?

Nova Scotia's research community was feeling similarly anxious. Hospitals had shut down non-emergent, non-COVID related services including surgeries. Seventy per cent of clinical trials and research studies were put on hold to enable the redeployment of resources to the COVID mitigation effort. After years of researchers assembling highly-skilled teams, they were now faced with the challenge of keeping their research teams and staff together.

Around the same time, Dr. Gail Tomblin Murphy, Vice President of Research, Innovation & Discovery and Chief Nurse Executive at Nova Scotia Health was in daily – if not hourly – conversations with her health care colleagues. In their lifetimes, there had never been a greater need for medical and health related

breakthroughs, yet there was a need to suspend ongoing clinical trials.

“It all started on a phone call with Bill Bean, (former) President and CEO at QEII Health Sciences Centre Foundation,” recalls Tomblin Murphy. “Nova Scotia has some of the best infectious disease experts in the country. How could we redirect and support them in their efforts to better understand COVID-19 in real-time, as it's developing? Where do we get the funding? Is it even possible?”

That call was the first of many. From there, they invited others into the conversation, including funding and research partners: Dalhousie University's Medical Research Foundation and the Faculty of Medicine, local hospital foundations including the Dartmouth General and IWK, as well as Research Nova Scotia. And each of those groups called on their own contacts, including donors, for funding and participation.

“Every time I made a call, I thought there's no way they are going to say yes, but everybody was so excited about

“The QEII Foundation immediately approved participation in the coalition because of the respect we have for our partner organizations, the urgency of the need to combat COVID-19, and the alignment with our mission, which is to advance healthcare.”

Bill Bean

Former President and CEO, QEII Health Sciences Centre Foundation

helping. They kept saying yes. This was unprecedented,” said Tomblin Murphy. For the first time, the research and innovation community that has traditionally competed for funding, was now working together to launch a coordinated COVID-19 research response.

Within a few days, the newly-named Nova Scotia COVID-19 Health Research Coalition had agreed on the priority areas – health system decisions, vaccine development, novel treatments, developing devices and tools, and social response to the pandemic – and raised \$1.5 million in their efforts to catalyze research efforts. The timeline was unthinkable short. The call for grant applications went out on a Friday and submissions were due back to the group by the following Wednesday.

By the following week, the coalition had received 262 submissions and went to work reviewing the proposals, ultimately awarding 40 grants to COVID-19 related projects whose goals aligned with the strategic priorities of the member organizations. The grants ranged in size from \$3,000 to \$75,000, and covered a wide variety of compelling and innovative studies that share the common goal of making a significant impact on COVID-19-focused healthcare in Nova Scotia.

There has never been a greater need for the research community to come together to conduct medical and health related research. According to Tomblin Murphy, however, this experience has been unique, defined by collaboration rather than competition.

The vision for NSH Health Innovation and Discovery Hub is to focus on providing the very best healthcare to Nova Scotians, with one body at the centre to lead and facilitate a variety of partnerships between foundations, patients, clinicians, researchers, private industry, academia, and government departments across the province. “We’ve gone from taking the model through the approval processes and and hoping people would see the value in partnership and collaboration, to actually using the model to create sustainable change.” said Tomblin Murphy of the Hub. “We use it. It works. And now, it’s one of the most important things we do.”

COVID-19 HEALTH RESEARCH COALITION PARTNERS



Every time I made a call, I thought there’s no way they are going to say yes, but everybody wanted to help.

Dr. Gail Tomblin Murphy
Vice President of Research, Innovation & Discovery and CNE

Point of Care Pivot⁺ in a Pandemic

The motto “expect the unexpected” rings all too true for a team of QEII Health Sciences Centre researchers who had been about to embark on a groundbreaking study to re-imagine the role of MRI in acute care when COVID-19 interrupted their plans.

QEII was to be the very first location in the world for a recently approved MRI device called Evry™. Developed by a Canadian med tech company, Synaptive Medical, this technology was designed to fit where the need was greatest, the emergency department of a busy hospital. “Evry is a half-Tesla (0.5T) superconducting magnet designed to overcome the challenges of standard whole-body superconducting systems.”, says Michelle MacPherson, Synaptive’s Director of Product Management. “But it’s small and lightweight, so it can be relocated virtually anywhere in a hospital to diagnose acute-care patients”.

Originally slated to be part of a ground-breaking research study to validate Evry’s use in emergency medicine, the research team had just recruited their first patient for the study the week the pandemic hit. As hospital services and research projects were shut down, it occurred to Evry’s research team that this brand-new piece of technology was a perfect fit for specific cohorts of COVID patients.

Hospital staff across the world had begun to notice an alarming increase in young COVID patients arriving at the Emergency Department exhibiting signs of stroke. Dr. Steven Beyea is Scientific Lead at Biomedical Translational Imaging Centre (BIOTIC), QEII Health Sciences Centre and IWK Health Centre. “Exactly what we believed to be the strength of this system is what was playing out right in front of us.” Dr. Beyea’s team worked quickly to shift their focus. In five days, they pulled together a proposal to use Evry to study what was going on in these COVID patients’ brains. This would mark the first-in-patient trials for the technology.

“We pulled together a team of critical care and infectious disease physicians, neurologists, radiologists and basic scientists. That’s the sort of thing we can do at QEII/NSH because we understand how to move quickly and to collaborate with all of the clinical science partners to make things happen.”

Dr. Steven Beyea, PhD
Scientific Lead, BIOTIC



Dr. Steven Beyea



Dr. David Volders



Dr. Adela Cora



Dr. James Rioux



Dr. Chris Bowen

The results of this innovative research will be of enormous benefit to the medical community by providing real-time evidence of the physiological and anatomical state of COVID patients. Evry is focused on brain imaging so patients only go into the machine up to their shoulders. It is also much easier to prepare and sanitize, making it easier to improve patient flow and increase imaging capacity. As Michelle MacPherson puts it, “Not only are the patients’ disease states ruled out or identified more accurately, the throughput of patients also increases.”

Dr. Beyea agrees, “The COVID pandemic is a tremendous example of a need that aligns exactly with the sort of area we are saying this technology can make an impact in’. I think this is a incredible opportunity for NSH to be at the leading edge of this research.”

When the COVID pandemic passes Beyea and his team will pick up where they left off. “We are absolutely committed to moving that research forward once it is safe to do so.”

Our intent is to be able to give the best quality of care in the Emergency Department, and have the best possible outcomes for patients by partnering with QEll on this new technology. Their research will not only help us answer more question, more quickly throughout a patient’s care, it will help us further develop this tech. We are super excited.

Michelle MacPherson
Director of Product Management, Synaptive Medical

Dr. Ivan Wong

Pioneering Improved⁺ Arthroscopy Outcomes

Driven by his passion for competitive sport, Dr. Ivan Wong is working to improve his patients' quality of life through innovative approaches to care. When an injury ended his athletic dreams, Dr. Wong channeled his passion and became a sports medicine surgeon. His specialization in arthroscopic shoulder, hip, and knee procedures help prevent future injuries and get athletes back to their sport in peak condition.

Hip replacement is an invasive surgery meant as a treatment for arthritis as a last resort. The surgeon substitutes natural bone with metal and plastic, which wears out and may need to be replaced more than once in a young patient's lifetime. According to Dr. Wong, hip replacement is the final solution, but treatment may be done to delay or even prevent this.



*If intervention happens early enough,
there is a potential to cure the problem.*

Dr. Ivan Wong
QEII Health Sciences Centre Orthopaedic Surgeon
Dalhousie University School of Medicine, Associate Professor



This procedure prevents some patients from needing hip replacement, and lets others return to competitive sports at a level they wouldn't have been able to otherwise.

Dr. Ivan Wong
QEII Health Sciences Centre Orthopaedic Surgeon
Dalhousie University School of Medicine, Associate Professor

Typically, if cartilage is damaged, it cannot regenerate on its own. Dr. Wong's arthroscopic hip preservation procedure involves two small incisions in the hip and the insertion of a specialized instrument called an arthroscope to remove the excess bone or spur and repair the labrum, a ring of strong but flexible cartilage on the hip socket. The cartilage is then able to be rebuilt with a material called BST CarGel®, which works with the body to replace, repair and rebuild the cartilage. Used in the past by knee surgeons, Dr. Wong is the first to publish a study regarding the effectiveness of this material in patients for hip arthroscopy. The results of his pioneering research on this procedure were recently published in *The American Journal of Sports Medicine*, providing evidence to back up Dr. Wong's enthusiasm for his approach.

Innovation in surgery can also take the form of different use of existing tools. Dr. Wong has developed the use of ultrasound technology in place of x-ray to perform hip arthroscopy procedures. Ultrasound removes the risk of radiation exposure to patients, surgeons and nurses, and also allows many more patients to be treated in smaller hospitals and clinics that don't have the space or access to X-ray within their operating room(s).

Dr. Wong has also pioneered the use of 3D models to plan hip arthroscopy surgery. "The innovation here is using 3D printing technology to improve our ability to re-build the joint arthroscopically, so a patient can potentially avoid hip replacement." The 3D model is also an important tool for patients to learn what will take place during the procedure and how the procedure may improve their quality of life.

Dr. Wong has demonstrated that by using any or all of these tools, he can create more individualized, person-centred care that creates better outcomes for each patient. In his words, "The bottom line is, if you have hip pain, we may be able to cure it if treatment is sought early enough."

"There is a rich research and innovation culture in Nova Scotia. Many health researchers, like Dr. Wong, are discovering and pioneering innovative opportunities to expand and improve how we deliver health care in this province and globally."

Dr. Gail Tomblin Murphy
Vice President of Research, Innovation & Discovery and CNE

Dr. Drew Bethune



Dr. Jean Phillippe Pignol



Dr. James Robar



Cutting Edge⁺ Collaboration

Innovation in healthcare can take the form of a giant leap, a series of small refinements, or a combination of the two. But innovation is always the product of collaboration and strong relationships and in this case, was helped along by a chance meeting in the hallway of a conference facility in Vienna.

RADIATION ONCOLOGY PROFILES ITS WORLD-CLASS LEADERS & THEIR FOCUS ON R&D

In 2018, Dr. James Robar, Chief of Medical Physics, NSH and Director of MSc and PhD Medical Physics program at Dalhousie University, was on the selection committee to find a new head of Radiation Oncology at Dalhousie University's Faculty of Medicine. He was pleased to see Dr. Jean-Philippe Pignol's name on the list, having read and respected his work on nanoparticle-aided radiotherapy.

That same year, Dr. Robar attended a medical convention in Vienna. In a chance encounter he ran into Dr. Pignol between sessions. They recognized each other immediately. "We spent a lot of time talking about R&D, about the fertile ground for medical R&D that had been created in Halifax by Dalhousie and NSH, and about how important it is to create a conduit for ideas and developments to reach patients – we were both very much interested in industry engagement." And in that, a relationship was formed. Dr. Pignol was appointed as Chair of Radiation Oncology at Dalhousie and Head of Radiotherapy at the QEII Health Sciences Centre in Winter 2018.

According to Dr. Drew Bethune, QEII surgical oncologist and senior medical director of the Provincial Cancer Program, "Nova Scotia was attractive to Dr. Pignol for various reasons. Our radiotherapy team was well formed. We've got 12 PhD medical physicists here in Halifax who have been doing brilliant world-class research, inventing technology that is used around the world."

Dr. Pignol came to Halifax from the Netherlands, a wealthy country with state-of-the-art radiation oncology equipment, including two Cyberknife units and a proton accelerator. The insurmountable

The promise lies in collaboration with industry to drive development of more intelligent and effective treatment methods for patients.

Dr. James Robar
NSH Chief of Medical Physics
Dalhousie University Faculty of Medicine
Director of MSc and PhD Medical Physics

cost of this equipment would be too much for Nova Scotia to bare, so he began to think of creative solutions to build on the strengths of the medical physics team. “What’s our future, where do we go? We don’t have the capital that bigger centers and cities have, but people are talented and have the imagination to do great things. It’s very impressive.”

USING NEW TECHNIQUES TO DELIVER CUTTING EDGE CARE

The physics group in Halifax had invented a new way of doing radiotherapy, called trajectory-based radiotherapy. It is a three-dimensional way of programming radio therapy machines to be very precise. According to Dr. Bethune, “With this technique, it’s not about creating the beam, it’s about aiming it. They’re smart beams that let you avoid critical structures.”

Dr. Robar explains, “Think about a tumor inside the body surrounded by a lot of organs at risk. Imagine a very complex path of that beam which is continuous, and continually avoids all of the healthy structures around it. This allows us to pick some very intelligent treatment plans that minimize the intersection of radiation beams with all of the healthy tissues. And in our medical physics group, we have spent years developing algorithms that do just that.”

The other major benefit, according to Dr. Robar, is that it’s efficient. Radiation therapy is fractionated, meaning patients need to return to hospital for treatment every day for a period of time. “For prostate cancer, for example, the typical number of daily fractions is 20. With this technology, the data suggests we can reduce the number of fractions to 4 or 5.” The implications for patients and improving access to care are

significant says Dr. Pignol: “This will let patients go back to their normal lives without side effects the next day.”

INTRODUCING CYBERKNIFE TECHNOLOGY

Dr. Pignol witnessed the cutting edge work of Dr. Robar’s team of medical physicists and radiation oncologists and suggested taking it one step further. His idea was to combine two pieces of existing technology into one treatment unit, specifically to pair the flexibility and precision of Cyberknife with an MRI scanner.

Cyberknife is typically used in tandem with a CT scanner for image guidance. CT scans show bone and muscle, not soft tissue. “If we want to be more precise in defining the target requiring radiation treatment, MRI is the best option. MRI has superior soft tissue contrast so you can see nodes and sequences”

“We could have a Cyberknife alone, and that would be beneficial for patients. We could have an MRI alone, also beneficial for patients. But combining the two will make us unique. Add on trajectory-based technology, and we will be world leaders in radiation treatment.”

A Cyberknife is a device that produces radiation so therapeutic X-Ray beams – much like our linear accelerator treatments we have in Halifax and Sydney – but totally different in that this device is on a robotic platform and has sub-millimetre precision in directing X-Ray beams.

“Nova Scotia is incredibly creative. There are huge opportunities here for innovation, partnership, excellence”

Dr. Jean-Philippe Pignol
Dalhousie University Faculty of Medicine
Professor and Chair, Radiation Oncology,
NSH Head of Radiotherapy

INITIATING A PATH FOR COMMERCIALIZATION

In addition to the patient benefits, Dr. Robar believes the real value of this work will be found in industrial engagement and collaboration. “if you don’t commercialize, the likelihood of these ideas becoming reality worldwide is very low.”

NSH department of medical physics has filed and licensed many patents on their innovative work with the help of Doris Grant, Senior Director of Innovation at NSH. Dr. Robar has great confidence in her leadership and ability to move their ideas forward. “I have the utmost confidence in the support and leaders at NSH to help us bring this to fruition and deliver value to Nova Scotians.”

Dr. Pignol shares this confidence as the profile of this work builds. “Nova Scotia is incredibly creative. There are huge opportunities here for innovation, partnership, excellence. Our idea – to combine Cyberknife with trajectory-based delivery and MRI technology – is a good example of that, a small concept that will have a big, transformative impact.

Building Partnerships and Making a Difference

Collaboration is at the heart of all research and Nova Scotia Health is working to expand both research and innovation initiatives across the province.

“We are always looking for ways to enhance how we deliver care and one way we can do this is by supporting researchers in their innovative approaches to improve patient experiences and health outcomes,” says Dr. Gail Tomblin Murphy, Vice President of the NSH Research, Innovation & Discovery team.

Recently, a unique and exciting collaboration began to take shape between NSH and St. Francis Xavier University (StFX) in Antigonish, N.S. A key component of this partnership is the three-year appointment of Dr. Britney Benoit as the first NSH Health Sciences Research Chair at the university’s Rankin School of Nursing.

Dr. Benoit holds a PhD in nursing from Dalhousie University, along with a MSc in nursing from McGill University and a BSc in human nutrition from StFX. As a registered nurse and researcher, Dr. Benoit works to improve care for patients, with a primary focus on maternal child health and care,

assessing infant pain and finding interventions that have strong evidence for optimizing health outcomes. Her efforts have concentrated around parental intervention, such as breastfeeding and skin-to-skin contact, and using these interventions to manage pain in infants.

With extensive experience collaborating with clinical teams across the research spectrum and transitioning evidence into practice in diverse clinical care environments, Dr. Benoit is a perfect fit for this role.

“I am so pleased to have Dr. Benoit in this important role,” says Dr. Tomblin Murphy. “This is an incredible opportunity to support research and collaboration across our province and to leverage resources and knowledge at a local level.”

The role of the NSH Health Sciences Research Chair is to build capacity for research that is relevant to provincial health priorities. This feat can only be accomplished by fostering collaboration and leveraging expertise across academic and health systems. New to the position, Dr. Benoit appreciates the importance of collaboration to achieving her goals and

those of NSH. “As a new health research investigator, this role has been integral to my building collaborative partnerships with health systems partners and generating relevant research questions and approaches to support health and healthcare in Nova Scotia.”

According to Dr. Benoit, there is a wealth of health research knowledge at StFX, with many faculty engaged in health-relevant research. The university is also home to a rich interdisciplinary team of health researchers across multiple faculties, including nursing, psychology, human nutrition and human kinetics.

“As the NSH Health Sciences Research Chair, I have the opportunity to bridge the gap between the health authority and StFX,” says Dr. Benoit. “With a rich, supportive culture at NSH for researchers, this partnership creates an innovative model for health authorities and academic institutions to effectively collaborate and build on larger partnerships.”

Through this unique partnership, NSH and StFX are exploring an innovative approach to enhance mental health and addictions services in the Eastern Zone of Nova Scotia – Cape Breton, Guysborough and Antigonish counties.

“In this role, I am able to collaborate across institutions and address research and innovation priorities within NSH Eastern Zone to meet the health care needs of the population and advance research priorities in that area,” says Dr. Benoit.

For Dr. Benoit, one of the key assets of this partnership is having access to expertise and resources from clinicians, administrators and policy makers. Building collaboration is key to really understand health care and system needs and priorities.

“I have additionally been engaged in the NSH Community of Scholars. The goal of this new network – to bring together health scientists in the province – represents a crucial opportunity, particularly for new investigators, to build networks and establish productive research programs that are responsive to provincial health needs.

Dr. Benoit recognizes that, as with all research, funding is central to its success. She noted that a key funding opportunity is the QEII Foundation Translating Research Into Care (TRIC) program to support the immediate implementation of knowledge into practice to provide the best real time care to patients and families.

In her position as NSH Health Sciences Research Chair and faculty at StFX, Dr. Benoit sees an opportunity for mentorship and a chance for students to broaden their understanding of what they can do in health care after they complete their education.

“This is a chance for students to experience diversity in the role of nursing and health science,” says Dr. Benoit.

Through the collaboration between NSH and StFX, the development of a Career Scientist Network is also underway to bring scientists together to support each other, share knowledge and expertise, and collaborate on advancing research to meet health and health research needs and priorities across the province.

NSH Research and Innovation is committed to supporting research that can lead to improvements in health care delivery and outcomes. As NSH is striving to create a world-leading research environment in Nova Scotia, this research will thrive through partnerships with the IWK Health Centre, Dalhousie University, StFX, and the QEII Foundation, to name a few.

“By coordinating our resources, we are giving researchers the tools to put their ideas into action and forge positive change within our health care system and communities,” says Dr. Tomblin Murphy. “In addition to our collaboration with Dalhousie and StFX universities, we hope to develop partnerships with other academic institutions in Nova Scotia to explore research and innovation opportunities, share knowledge and resources, and build capacity.”

Dr. Britney Benoit &
Dr. Gail Tomblin Murphy



By coordinating our resources, we are giving researchers the tools to put their ideas into action and forge positive change within our health care system and communities.

Dr. Gail Tomblin Murphy
Vice President of Research, Innovation & Discovery and CNE

QEll Foundation ⁺ Catalyzing Improvements in Cancer Care

Medical research is conducted with the overarching goal of improving people's lives. But the value of research isn't fully realized until research teams translate the science into treatment and care. Nobody understands this better than the QEll Health Sciences Centre.

QEll Foundation Translating Research Into Care (TRIC) grants fuel direct and positive changes for healthcare, including better patient outcomes, reduced wait times and improved access to care. They provide the opportunity for researchers to collaborate with health system administrators and patients to improve the way healthcare is delivered in Nova Scotia.

TRIC grants help turn science and theory-based ideas into improved practice and clinical innovation. They are made possible by donors who believe in the power of research to advance healthcare.

Dr. Matthew Rigby, NSH Researcher and QEll Head and Neck Oncology Surgeon, is part of a team working to close that gap between evidence and practice with the help of a 2019 QEll Foundation TRIC grant. Along with Dr. Martin Bullock (Division of Anatomical Pathology at QEll Health Sciences Centre) and Dr. Laurette Geldenhuys (Division Head, Anatomical Pathology QEll), Dr. Rigby is conducting a study to assess whether a surgical protocol that proved remarkably successful for head and neck tumors will also improve care for patients with unknown primary tumors.

For decades, patients who presented with cancer of the head and neck followed a fairly predictable pattern – over 60, heavy smokers and/or drinkers, with underlying health conditions. Non-smokers who developed throat cancer were quite rare. But over the years, oncologists began to notice an alarming rise in throat cancer in younger, otherwise healthy patients. Around 2007, Nova Scotia was seeing an annual average of 145 new cases of mouth, throat or voice box cancer. The data suggests that by 2028, that number is projected to be as high as 220 cases per year in Nova Scotia.

Dr. Rigby observed that trend. “Head and neck cancer rates are pretty stable. But if you look more closely, you'll find cancers in the front of the mouth, tongue, and voice box are

Dr. Martin Bullock



*I think it's a big
win for patients.*

Dr. Martin Bullock,
QEll Division of Anatomical Pathology

going down. But the back of the tongue and tonsil rates are skyrocketing. That's HPV."

Human Papillomavirus (HPV) has been around since the 1960s, and we've known for years that it can cause cervical cancer in women. We now know that it also causes throat cancer in men and women. According to Dr. Rigby, "Cancers in the tonsils and tongue base are often in the folds lymphoid tissue where there is a lot of surface area. You can have a cancer growing that you can't see or feel because it's so small, but it can quickly spread to a node in your neck".

That is an unknown primary tumor – where the cancer is detected in a neck node, but the oncologist doesn't know where it originated.

Back to the study – a few years ago, the same team of researchers conducted a QEII Foundation TRIC-funded study that saw remarkable improvements in the success rate of head and neck tumor surgeries through interoperative assessment. Surgeons would remove a tumor with a good margin and send the entire thing to an adjacent pathology lab while the

Dr. Laurette Geldenhuys



I'm thrilled that our division can participate and play a part in supporting this very important work that has such huge implications for patients.

Dr. Laurette Geldenhuys
QEII Health Sciences Centre Division Head, Anatomical Pathology
Dalhousie University, Department of Pathology and Nephrology, Professor

patient remained in the operating room. Pathology results would let them know there and then if they needed to resect more of a margin, or if they could close the patient up.

Under the old protocol, surgeons would send just a strip of tissue to pathology to be examined and wait, sometimes for weeks, to find out there if was a positive margin – less than ideal for the surgeon, the patient or the healthcare system.

Finding an unknown primary can be challenging. Clinically speaking, it's most likely the tumor is in the tonsil. According to Dr. Martin Bullock, Co-PI on this study, "That's where they're looking for these tumors in patients who fit the profile of HPV-mediated tonsillar cancers." Once the surgeon removes the tonsil, Dr. Bullock and his team of pathologists and lab

technologists prepare and examine the tissue on the spot, find the tumor and check the margins for cancer cells.

According to Dr. Laurette Geldenhuys, it's also a win for the health care system. As medical co-lead, her main role is to ensure the pathology policies and procedures were fully implemented for the new process; and to monitor the time it took for each procedure to determine if the experimental protocol would have a significant impact on the system. "It's actually had a great outcome. Most importantly, it improves survival rates among patients, and seems to have very little impact on the laboratory side – the increase in human resources that was required was very small."

Dr. Matthew Rigby



Investing in Healthy Hearts⁺

Maritime Heart Centre Innovation Fund

Atrial Fibrillation (Afib) is the most common type of heart rhythm disorders – affecting 200,000 Canadians, and causing one in four strokes after the age of 40. Most often experienced as arrhythmia, symptoms include shortness of breath, palpitations, dizziness, fainting and chest pain, though some patients exhibit no symptoms at all. Untreated, Afib can lead to blood clots, stroke, and ultimately heart failure. Dr. Ratika Parkash MD MS FRCPC, Director of Research, Division of Cardiology has been studying atrial fibrillation for more than a decade. “There are some patients that are so symptomatic, it debilitates their entire quality of life. It’s quite common”.

One of effective treatments for Afib is ablation. Abnormal heart rhythms can be triggered by areas of abnormal electrical activity. Ablating, or destroying these areas has been shown to stop the abnormal electrical signals, allowing the heart to return to normal heart rhythm. But even with ablation, the recurrence rate can be significant, according to Dr. Parkash. “The ablation procedure works, but we’ve

experienced high recurrence rates, 30 to 40 per cent or higher”, leading her to postulate that there are other factors that need to be controlled.

Dr. Parkash’s current research is being funded by the Maritime Heart Centre Innovation Fund. It focuses on the external factors that trigger and maintain Afib, other than what goes on in the heart itself. “This study is about examining all of those risk factors that aggravate atrial fibrillation – activity level, blood pressure, alcohol consumption, smoking, uncontrolled diabetes, untreated sleep apnea – we target them all.”

It is a randomized trial funded by a Maritime Heart Centre Innovation Fund. Half the patients get intensive intervention, and the other half get the standard guidelines-based treatment. “Our intervention is a home-based rehab program that we’re running out of the University of Ottawa Heart Institute. We wanted to be able to deliver this to anybody, regardless of where they live or how much money they have, to make it universally available, so we chose to do it in patients’ homes rather than bringing them to rehab facilities that aren’t always accessible.”

Dr. Rakita Parkash

“We want to avoid second and third procedures, and the need for patients to continue on medications that have side effects and potential dangers.”

Dr. Ratika Parkash MD MSc FRCPC
QEII Health Sciences Centre, Director of Research, Division of Cardiology (Arrhythmia)
Dalhousie University, Division of Cardiology, Department Medicine, Professor

During the study, an Exercise Physiologist will guide Afib patients through the physical activities they can do in order to reach the recommended guidelines of 150 minutes of exercise per week. Pedometers will help guide their exercise and provide feedback to the research team. The Maritime Heart Centre grant is also helping Dr. Parkash and her team examine the effect sleep apnea has on Afib, allowing them to set up an independent core lab to study sleep apnea and provide unbiased interpretation of the results.

Dr. Parkash’s team includes specialists across the country who see patients for ablation. She is also working with a former Dalhousie University professor, Dr. Robert Rose, who is now at the University of Calgary, on a sub-study that looks at all of the factors that affect the mechanisms of atrial fibrillation, including atrial imaging, bio-markers and how genes affect a person’s response to physical activity. According to Dr. Parkash, “the simple part of the study is the randomization of intensive activity program versus nothing. But then there are all of these other things we will look at that will allow us to learn more about Afib. The results they find over the next couple of years of study will provide volumes of data that could result in fewer ablations, and overall healthier patients. “So that’s where the excitement and enthusiasm come from”.



We wanted to make this sustainable lifestyle change a part of their lives. So, once the intensive protion is finished, they can just maintain it at home.

Dr. Ratika Parkash MD MSc FRCPC
QEII Health Sciences Centre, Director of Research, Division of Cardiology (Arrhythmia)
Dalhousie University, Division of Cardiology, Department Medicine, Professor



Pitching Innovation: A Virtual Win for Healthcare⁺

NSH partners to launch Health Challenges designed to solve Atlantic Canada's top health care priorities

The health needs of Atlantic Canadians are evolving and Nova Scotia Health has recognized the transformative power of our innovation community and their ability to accelerate the pace of change. With the breadth of clinical, industry, and government networks, NSH is uniquely positioned to inform the development, implementation, and operationalization of new innovative technologies and services to benefit our healthcare system and the treatment of patients.

But, we can't do it alone.



Our success will depend on one thing: building a team that has the expertise to effectively form and leverage partnerships to accelerate our growth.

Dr. Gail Tomblin Murphy
Vice President of Research, Innovation & Discovery and CNE



NSH’s courage to innovate is unique and demonstrates their commitment to change. Adaptiiv is thrilled to be able to leverage the network of clinical expertise in the Radiation Oncology field to help our company grow and develop life changing products.

Peter Hickey
CEO, Adaptiiv

Partnerships are critical to the health innovation space and have many important insights that will accelerate our quest to become a digital health leader in Atlantic Canada. Embedding innovation into the NSH portfolio was the quintessential ingredient that led Dr. Gail Tomblin Murphy to take on the role of Vice President, Research, Innovation & Discovery at NSH. Knowing the power of collaboration and industry partnerships, Dr. Tomblin Murphy was excited and inspired to take on the challenge. This resulted in a new team with strong expertise in innovation, business

“Volta is incredibly proud to support the work NSH is doing to bring innovative technologies into regional hospitals to enhance patient care. Their focus on driving innovation, while also providing a spotlight on medtech companies in the region, is truly inspiring.”

Martha Casey
Volta Interim CEO and COO

development, commercialization, and technology transfer that would turn innovative discoveries and developments into improved health outcomes for Nova Scotians.

To drive the newly established innovation agenda, Nova Scotia Health partnered with Volta, BioNova, QEII Foundation, and the Atlantic Canada Opportunities Agency, to launch the Nova Scotia Health’s inaugural Health Challenge, a series of five pitch events, each focusing on a health care priority affecting Atlantic Canadians. Catering to locally-driven solutions, NSH engaged the start-up community and was met with an overwhelming response. Multiple applicants came forward in a fierce competition that highlighted how healthcare and medtech unite to create change that will have a lasting impact on health and healthcare in Nova Scotia. Ultimately, the top four Atlantic Canada companies pitched their cancer care technologies at the first challenge hosted on June 19th, 2020 with over 100 audience members tuned in to the virtual event. A panel of industry champions made the determination of who would receive the \$100,000 prize alongside the opportunity to integrate the technology into NSH’s clinical operations.

The winning pitch came from Adaptiiv Medical Technologies Inc., for their ground-breaking software that creates patient-specific medical devices to be used during radiation therapy. These 3D printed boluses – created to each patient’s unique specifications – will improve the accuracy of the cancer treatment as well as the patient experience.

Dr. Tomblin Murphy is both optimistic about the value this kind of collaboration brings to Nova Scotia’s healthcare system, and is eager to build on this momentum. Stay tuned for the next Health Challenge event in the Fall 2020 as well as more exciting things to come from NSH’s Research & Innovation portfolio.

HEALTH CHALLENGE PARTNERS



NSH Research Fund Awards

November 2019 Nova Scotia Health Research Fund Award Recipients

NAME	DEPARTMENT	AWARD	RESEARCH DESCRIPTION
Kara Dempster	Psychiatry/ Early Psychosis Program	\$50,000 Cat 1	Investigating Anterior Cingulate Cortex Glutamate as a Biomarker of Clozapine-Eligibility in First Episode Psychosis
Grace Warner	School of Occupational Therapy	\$24,955 Cat 2	Applying an implementation science framework to understand how to facilitate successful implementation and spread of innovations in primary healthcare
Jonathan Bailey	Anesthesiology	\$23,561 Cat 2	Continuous Serratus Anterior Blockade for Sternotomy Analgesia following Cardiac Surgery: A pilot feasibility study
Emily Marshall	Family Medicine	\$24,901 Cat 2	Pharmacists managing care for Unattached Patients in Nova Scotia: An exploration of pharmacists' perspectives
Jayne Vianna	Ophthalmology and Visual Sciences	\$17,955 Cat 2	Association of Frailty with the Structure-Function relationship in Glaucoma
Karen McNeil	Family Medicine	\$24,980 Cat 2	Developing a multifaceted intervention to support annual health checks for adults with intellectual & developmental disabilities: A step toward health equity
Melanie Keats	Medicine/ Medical Oncology	\$24,975 Cat 2	A dyadic approach to cancer care: A feasibility and efficacy partner-based exercise study
Derek Fisher	Psychiatry	\$24,750 Cat 2	Neuroimaging markers of auditory change detection mechanisms in high risk psychosis populations: A magnetic resonance spectroscopy add-on
Antonina Omisade	Psychology/ Surgical Epilepsy Program	\$24,792 Cat 2	Prognostic biomarkers of seizure recurrence after first seizure and in New Onset Epilepsy: Predictive value of cognition and brain connectivity
Hilal Al Sidairi	Pathology/ Microbiology	\$5,000 Cat 3	The effect implementing a molecular assay and antimicrobial stewardship intervention on the treatment of S. aureus bloodstream infections
Abraham Nunes	Psychiatry/ Eating Disorder Program	\$4,984 Cat 3	A pilot study of the effects of Lisdexamfetamine Dimesylate (Vyvanse) treatment on exploration/exploitation balance in adults with Bulimia Nervosa

NSH RESEARCH FUND COMMITTEE

Dr. Kim Good, Co-Chair
Dr. Jennifer Payne, Co-Chair (Interim)

Olga Kits
Dr. Jason Leblanc
Dr. Jeremy Brown
Heather Neville
Dr. Sean Christie
Dr. Lisa Barrett
Dr. Wenda Greer
Dr. Madelaine Plourde
Dr. Todd Hatchette
Dr. Steven Beyea
Dr. Andrew Glennie
Dr. Kelly Dakin-Hache
Amanda Tinning
Dr. Dan Gaston
Dr. Sharon Clarke
Dr. Emily Marshall
Dr. Chris Kenyon
Dr. Jillian Banfield
Dr. Gabrielle Richard
Dr. Gail Eskes
Dr. Judah Goldstein
Dr. Ravi Ramjeesingh
Dr. Robin Urquhart

QEII Foundation Translating Research Into Care (TRIC) Awards

May 2019 QEII Foundation TRIC Award Recipients

NAME	AWARD	RESEARCH DESCRIPTION
Dr. Sean Christie & Randi Monroe	\$3,000.00 Level 1	Implementation of an Enhanced Recovery after Surgery (ERAS) Protocol for Spine Surgery at the QEII Purpose: To begin the development of an Enhanced Recovery After Surgery (ERAS®) protocol for patients undergoing spine surgery at the QEII.
Dr. Ruth Martin-Misener & Dr. Tara Sampalli	\$2,975.98 Level 1	Co-designing a Strategy in Primary Care to Promote Relevant Services and Supports that are Available for Patients with Multiple Chronic Conditions Purpose: To develop a coordinated strategy in primary care for promoting programs and services that are intended to help NS patients with multiple chronic conditions.
Dr. Ruth Martin-Misener, Susan Philpott & Dr. Tara Sampalli	\$2,876.00 Level 1	Improving Access to Care Through Enhanced Implementation of Interprofessional Collaborative Primary Care Teams in Nova Scotia Purpose: To study the barriers and facilitators for implementing interprofessional collaborative primary care teams in Nova Scotia.
Dr. Ashley Miller & Dr. Tara Sampalli	\$3,000.00 Level 1	eConsults to Improve Timely, Equitable Access to Specialty Care: Examining Feasibility and Relevance to Nova Scotia Purpose: To test the value, adoptability, suitability, and feasibility of an eConsult service (i.e. consults over the phone or electronically between primary care providers and internal medicine specialists) in Nova Scotia.
Dr. Janet Roberts & Cheri Gunn	\$29,933.20 Level 2	Improving Rheumatology Resource Utilization and Access to Specialty Care for Patients with Early Inflammatory Arthritis in Nova Scotia Through Enhanced Triage Purpose: To develop, validate and implement a centralized triage system for patients with arthritis.
Dr. Lana Sacriagic & Dr. Marcy Saxe-Braithwaite	\$60,000.00 Level 3	GO TIME! Transforming Care and Improving Quality in Gynecologic Oncology (GO) with Implementation of an Enhanced Recovery Program Purpose: To implement Enhanced Recovery After Surgery (ERAS®) - a set of guidelines for care around the time of surgery - for women undergoing gynecologic oncology surgery at the QEII.

QEII FOUNDATION TRIC GRANT REVIEW COMMITTEE

Dr. Melissa Andrew	Dr. Jordan Warford	Anne MacPhee	Shelley Saunders	Dr. Kim Brewer	Brad Osmond	Dr. Erna Snelgrove-Clarke
Keltie Jamieson	Dr. Marilyn MacDonald	Dr. Leslie Anne Campbell	Dr. Grace Warner	Dr. Janet Curran	Dr. Jill Hatchette	Dr. Leah Cahill
Randi Monroe	Dr. Richard Braha	Shauna Best	Jyl MacKinnon	Sandi Kidston	Dr. Robin Urquhart	Dr. Annette Rushton
Dr. Meaghan Sim	Dr. Amy Grant		Amanda Hatt	Dr. Gail Eskes	Andrew Nemirovsky	Dr. Kathryn MacIsaac Jennifer West

QEII Foundation Translating Research Into Care (TRIC) Awards

November 2019 QEII Foundation TRIC Award Recipients

NAME	AWARD	RESEARCH DESCRIPTION
Sarah M. McMullen & Patricia Daley	\$2,997.50 Level 1	Fostering Compassion at the End of Life: The 3 Wishes Project Purpose: To assess the impact of the QEII's "3 Wishes Program" that supports ICU patients receiving end of life care, their families and care providers, and to consider program expansion to other ICU's.
Heather Neville, Kent Toombs	\$3,000.00 Level 1	Interventions to Reduce Benzodiazepine and Sedative-Hypnotic Drugs in NSH: Team and Grant Proposal Development Purpose: To design interventions aimed at reducing benzodiazepine and sedative-hypnotic drug use for hospitalized older adults.
Dr. Brittany Benoit & Jennifer Leuschner	\$3,000.00 Level 1	Co-development of implementation interventions to support parent-led infant pain care: A collaborative, theoretically informed planning study Purpose: To better understand the use of parent-led pain care for infants.
Suzanne Baker & Debbie Doucette, RN	\$3,000.00 Level 1	Functional Independence in Acute Care Purpose: To examine whether a Tiered Exercise Program for hospitalized older patients can prevent hospital acquired deconditioning and promote early functional independence
Dr. Phil Tibbo & Neil Henderson	\$24,988.10 Level 2	Prolonged psychotherapy for adverse events in early phase psychosis with comorbid substance use: Maintenance mechanisms and treatment outcomes Purpose: To adapt and optimize Prolonged Exposure therapy for young early psychosis patients with comorbid substance misuse.
Dr. Alix Carter & Lori Sanderson	\$57,030.26 Level 3	Implementation of the Nova Scotia provincial palliative notification system to reduce interventions for patients receiving palliative care transported by ambulance to emergency departments Purpose: To expand the palliative care patient alert system to see if this can reduce low benefit or unwanted tests and treatments for palliative care patients who visit NS Emergency Departments.
Jennifer Hancock & Patricia Daley	\$59,687.68 Level 3	Evaluating Front-line Ownership to Improve Team Dynamics and Build Resilience at the QEII Intensive Care Unit. Purpose: To implement and evaluate an intervention called "Front-Line Ownership" that aims to improve the ICU culture, team dynamics, staff resilience, and reduce staff burnout.
Dr. Mathew Rigby, Dr. Martin Bullock & Dr. Laurette Geldenhuys	\$60,000.00 Level 3	Implementation of a protocol for intraoperative primary tumor identification and margin assessment in Head & neck unknown primary tumors Purpose: To assess whether a known successful surgical protocol for head and neck cancer patients will also improve care for those with unknown primary tumors.

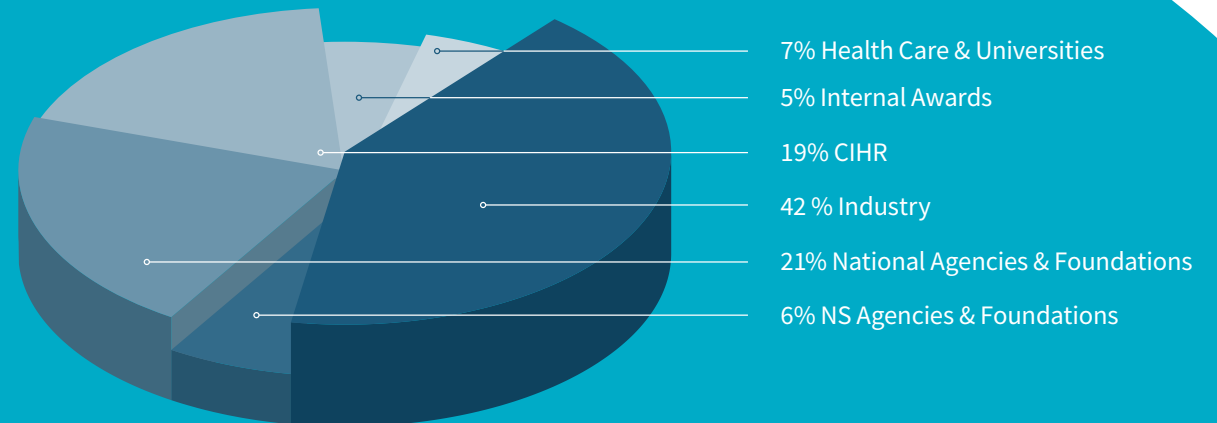
Award Totals for Research Conducted at NSH

2019-2020 Fiscal Year

	ADMINISTERED AT NSH	ADMINISTERED AT DALHOUSIE	
Research Grants	\$18,632,245	\$2,119,890	Grand Total \$31,167,262
Research Contracts	\$10,323,533	\$91,594	
Total	\$28,955,778	\$2,211,484	

Source of Awards for NSH Research

2019-2020 Fiscal Year



Nova Scotia Health - All Research Accounts

Statement of Revenue and Expenses for the Twelve Months Ended March 31, 2020

	ACTUALS 19/20	ACTUALS 18/19	VARIANCE
Opening Balance April 1	\$ 47,232,910	\$ 42,349,698	
REVENUE			
Grants*	\$ 19,057,207	\$ 14,618,455	\$ 4,438,752
Contracts*	\$ 7,514,843	\$ 8,121,102	\$ (606,259)
Interest and Realized Gain on Investments	\$ 1,050,469	\$ 3,016,096	\$ (1,965,627)
Federal Research Support Program	\$ 933,732	\$ 880,658	\$ 53,074
Donations & Other Revenue	\$ 108,574	\$ 403,309	\$ (294,735)
Ethics Review Fee	\$ 210,973	\$ 318,976	\$ (108,003)
RMU Consulting Fee	\$ 133,136	\$ 88,900	\$ 44,236
Record Retention Fee	\$ 55,000	\$ 63,774	\$ (8,774)
Bad Debt Expense	\$ (564,263)		\$ (564,263)
Gross Revenue	\$ 28,499,671	\$ 27,511,269	\$ 988,402

OVERHEAD DISTRIBUTION	19/20	18/19	VARIANCE
CZ Research Services	\$ 1,033,810	\$ 1,076,275	\$ (42,465)
CZ Research Development	\$ 162,234	\$ 242,175	\$ (79,941)
EZ Research	\$ 30,120	\$ 41,871	\$ (11,751)
University Departments	\$ 255,857	\$ 376,483	\$ (120,626)
Faculty of Medicine, Dalhousie University	\$ 383,786	\$ 320,707	\$ 63,079
Total overhead	\$ 1,865,807	\$ 2,057,511	\$ (191,704)

	ACTUALS 19/20	ACTUALS 18/19	VARIANCE
EXPENSES			
Compensation	\$ 14,102,968	\$ 14,316,527	\$ (213,559)
Supplies and Services Expenses			
Purchased Services/ Professional Fees	\$ 1,408,728	\$ 1,472,610	\$ (63,882)
Transfers Offsite	\$ 2,115,105	\$ 2,313,188	\$ (198,083)
Diagnostic & Therapeutical	\$ 1,219,657	\$ 1,187,198	\$ 32,459
Overhead to Dalhousie	\$ 639,642	\$ 697,190	\$ (57,548)
Maintenance	\$ 362,789	\$ 595,062	\$ (232,273)
Equipment	\$ 2,488,850	\$ 488,126	\$ 2,000,724
Travel/Professional Development	\$ 616,462	\$ 436,338	\$ 180,124
Travel/Patient	\$ 418,222	\$ 379,339	\$ 38,883
Printing/Office and Computer Supplies	\$ 755,645	\$ 375,710	\$ 379,935
Pharmacy Services and Drugs	\$ 367,925	\$ 283,981	\$ 83,944
Other Expenses	\$ 329,356	\$ 254,940	\$ 74,416
Medical/Surgical Supplies	\$ 188,692	\$ 254,297	\$ (65,605)
Communications	\$ 31,482	\$ 44,178	\$ (12,696)
Recoveries of Expenses	\$ (437,763)	\$ (470,627)	\$ 32,864
Total Expenses	\$ 10,504,792	\$ 8,311,531	\$ 2,193,261
	\$ 24,607,760	\$ 22,628,057	\$ 1,979,703
Net Inflow/outflow	\$ 3,891,911	\$ 4,883,212	\$ (991,301)
Unrealized Gain (Loss) on Investments	\$ (3,463,907)		\$ (3,463,907)
Ending Balance March 31, 2020	\$ 47,660,914	\$ 47,232,910	\$ 428,004

* Includes overhead

Nova Scotia Health

Research & Innovation Team and Research Ethics Board

Dr. Gail Tomblin Murphy
Vice President, Research, Innovation &
Discovery and Chief Nurse Executive
Nova Scotia Health

Research & Innovation Team

RESEARCH TEAM

Dr. Jordan Warford, Senior Director, Research
Dr. Adrian MacKenzie, Director, Research
Michele Chappell, Program Manager, Research Quality
Andrew Hamilton, Manager, Research (Eastern Zone)
Charlynn Cox, Research Coordinator (Eastern Zone)
Alexandra Bruleigh, Research Coordinator (Eastern Zone)
Kathleen Hines, Administrative Assistant (Eastern Zone)

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Doris Grant, Senior Director, Innovation
Kelly Reinsborough, Director, Innovation
Brittney MacKinnon, Director, Business Development
Jennifer Thurlow, Manager, Contracts, Grants & Research Support
Sandra Crowell, Program Leader, Research Development
Hanna Abel, Coordinator, Contract Facilitation & Support
Stacey Pyke, Administrative Coordinator, Contracts & Grants

RESEARCH METHODS UNIT TEAM

Daniela Meier, Manager
Sandra Pauls, Finance & Administrative Officer
Dr. Prosper Koto, Health Economist

Steve Doucette, Senior Biostatistician
Olga Kits, Qualitative Methodologist
Kara Matheson, Biostatistician
Chris Theriault, Senior Research Database Specialist

SENIOR SCIENTIFIC TEAM

Dr. Tara Sampalli, Senior Scientific Director
Dr. Nancy Carter, Evaluation Scientist
Dr. Katheryn McIsaac, Health Outcomes Scientist
Dr. Dan Marsh, Research Facilitator (Western Zone)

RESEARCH ETHICS BOARD TEAM

Dr. Marie-Laurence Tremblay, Manager, Research Ethics
Joan Morrison, Ethics Coordinator
Josie LeClair, Ethics Coordinator
Shelley MacDonald, Ethics Coordinator
Jennifer MacVicar, Ethics Coordinator

HR & CORPORATE SERVICES TEAM

Dawn Munroe, Manager, HR
Sheryl-Lynn Forward, HR Advisor
MaryBeth Campbell, HR Recruitment Assistant
Andrea Dean, Program Manager, Research Education
Patti Green, Communications Coordinator
Michelle Doyle, Executive Assistant to VP
Michelle Roden, Administrative Assistant
Karen Emberly, Administrative Assistant to Senior Directors
Michelle Boudreau, Administrative Assistant to Directors

RESEARCH & INNOVATION FINANCIAL SERVICES TEAM

Dave Denman, Manager, Finance
Jane MacLeod, Senior Financial Analyst
Steven Cromlish, Financial Analyst
Kaitlyn Hinks-Churchill, Accounting Clerk

Research Ethics Board (REB)

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Dr. Sarah Kirby, Co-Chair
Dr. Andrew Jarvie, Co-Chair
Sue Pleasance, Co-Chair
Dr. Osama Loubani, Co-Chair
Dr. Anne Marie Kreueger-Naug, Co-Chair
Gredi Patrick, Co-Chair
Dylana Arsenault, Zone 1 Executive Representative
Dawn Fougere, Zone 2 Executive Representative
Natalie Oake, Zone 3 Executive Representative
Dr. Marie-Laurence Tremblay, Research Ethics Manager

In addition to the NSH Research Ethics Board executive and office staff, the Board has 89 volunteer members. These members are drawn from the community, the legal profession, medical and health staff, and hospital employees.



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