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*On the cover—top right: Samantha Muise receives a nerve block prior to surgery  
bottom: left to right: Dr. Aaron Keshen, Thomas Helson, Sarrah Ali & Laura Dixon*

# Tackling Today's Tough Issues in Health

We are facing difficult health issues here in Nova Scotia. Research and innovation play a key role in tackling these tough issues effectively.

Whether it's addressing the challenges posed by our aging population, mental health problems, or inadequate access to timely services, research provides the information that enables us to make the right decisions—then assess the results and adjust as required.

Not only is research and innovation allowing us to improve health services to meet the health care needs of our population more swiftly, effectively and economically—it is also guiding our efforts to fundamentally transform our health care system into a system that supports individuals, families and communities through a continuum of services to help people be healthy and stay healthy.



*Janet Knox*

This work is moving forward aided by a commitment to an integrated research strategy involving the Nova Scotia Health Authority, the Government of Nova Scotia, universities all across the province, non-profit organizations, private sector partners, health care professionals, and members of the public. Together, we are harnessing the power of research and innovation to improve not just health services but the health of our population.

To reach this goal, we must create a culture of inquiry. We can see the shift happening, as more and more clinicians, administrators, patients and others are seeing the benefits of research and getting involved. We are also building more research capacity at NSHA—for example, this year we welcomed our first postdoctoral research fellows supported by a Training Modernization Grant from the Canadian Institutes of Health Research, in collaboration with Dalhousie University and Mount Saint Vincent University.

In our last NSHA Research Annual Report, we presented an overview of the collaborative research initiatives underway to transform primary health care in Nova Scotia. This effort continues to support our work in primary health care.

In this year's report, we take a closer look at specific, often highly challenging issues and how our researchers are addressing them. Aging, addictions, eating disorders, post-operative complications, pain, terminal cancer... these are just some of the challenges that urgently require effective solutions.

Our researchers are tackling these tough issues from many different angles, involving community partners, colleagues and international collaborators in their efforts to lead the way to better care and better health for people in the Maritimes and beyond.

I'm very pleased to present this year's Research Annual Report and hope you enjoy learning about our research community's important contributions to better health.

Sincerely,

Janet Knox  
President and CEO  
Nova Scotia Health Authority



# Working Towards Health or Disease?

## Researchers examine effect of job history on health into old age

It's a rarely explored question upon which Dr. Judith Godin wishes to shed some long-lacking light—how does our lifetime of work affect our health status and trajectory as we get older?

“I want to paint a picture for our policymakers about the effect of occupational history across the life course on long-term health outcomes,” says Dr. Godin, a research associate in the Division of Geriatric Medicine. “It’s important to know if efforts to save money on one end are costing us more in health care on the other end.”

Dr. Godin is working with research assistant Alexandra van der Valk and PhD candidate Lindsay Wallace to analyze data from SHARE, the Survey of Health and Ageing and Retirement in Europe. Launched in 2004, this survey involves more than 120,000 individuals over the age of 50 in 27 European countries, plus Israel. Unlike most surveys of this nature that just ask about major occupations, SHARE examines participants’ complete occupational history.



“We will be able to examine the impact of such factors as job satisfaction, opportunities for advancement, degree of control at work and the physical and mental demands of a job, on people’s long term health,” says Godin. “We can also look at a person’s progress over the course of their working life. Did they enjoy a gradual upward trajectory of income, responsibility, authority and freedom, or did they stagnate or even decline? What was the effect on their finances, stress level and health?”

*How does our lifetime of work effect our health status as we get older?*

The team’s findings from the European data can be generalized to Canada to some extent, but Godin says the researchers’ major aim is to find leads that will guide their future analysis of Canadian data. The Canadian Longitudinal Study on Aging, for example, will become a rich source of similar information as it gathers more data over time.

“We want to understand how occupational history is related to health trajectory and how this affects a person’s use of health care resources over time,” says Godin. “Understanding this will help to inform healthy public policy in such areas as minimum wage, retirement age and pensions, vacation, benefits, professional development and other important areas that affect people’s wellbeing.”

Dr. Melissa Andrew, a geriatrician at NSHA and leader of the Canadian Consortium on Neurodegeneration in Aging’s “Multimorbidity in Relation to Dementia” team, is an advisor to the project. So is Dr. Olga Theou, an NSHA-affiliated scientist in the Division of Geriatric Medicine. The project received an NSHA Research Fund grant to explore the SHARE data.

# Dangerous Delays

## Helping trans individuals access health services

Timely access to health services related to gender transition is critical. People going through a gender transition often face stigma, discrimination and loss of support networks, which can lead to depression and poor mental health. According to studies conducted around the world, as many as 40 to 45 per cent of trans people attempt suicide at some point in their lives.

“Research tells us the risk is most acute in the time frame after they’ve made a decision to transition, but before they’ve been able to access services to get the process started,” says Kate Shewan, executive director of The Youth Project, a Halifax-based organization that supports young people aged 25 and under around issues of gender identity or sexual orientation. “Unfortunately, wait times have been a big issue.”

Shewan is the community advisor to a new NSHA research project seeking to improve pathways to health care for trans people in Nova Scotia. The project, supported by a QEII Foundation funded TRIC (Translating Research Into Care) grant, is co-led by Kolten MacDonell, health services manager, NSHA Primary Health Care & Department of Family Practice, & Dr. Jacqueline Gahagan, an NSHA-affiliated scientist and professor in Dalhousie’s School of Health and Human Performance.

“At this time, we don’t have a single point of entry to the health care system for people seeking services related to their gender identity,” notes MacDonell,

who manages prideHealth in Primary Health Care. “As a result, wait times for an initial assessment can vary from months to years.”

Trans people often require counselling for gender dysphoria, the distress of living with a gender identity that’s at odds with their sex assigned at birth. Those who’ve decided to transition require a psychosocial readiness assessment before being referred for gender-affirming hormone therapy and/or gender-affirming surgery. Depending on how they access the

system, the entire process can take as long as three years.

“We will start by asking trans people and health care providers what they see as delays in receiving timely care and how best to address them,” says Dr. Gahagan, noting that the researchers are collaborating with Community Mental Health in this effort.

“From this data, we’ll be able to form an advisory committee to lead the development of more streamlined processes and triage

**45% of trans people are attempting suicide at some point in their lives & they are especially at risk while waiting for services**

protocols to reduce delays.”

Ultimately, the researchers and their community stakeholders aim to ensure timely access and improve coordination of care of services that align with the World Professional Association for Transgender Health (WPATH), the current gold standard for patient-centred care of trans individuals.

# Beating Eating Disorders

## Researchers test creative ways to resolve binge-eating and purging disorders

As many as 30,000 Nova Scotians suffer from binge-eating disorder (BED), the most common eating disorder in adults. BED sufferers feel a loss of control and consume much larger quantities of food than is healthy for them. This can lead to such problems as obesity and diabetes, as well as social and emotional issues that can wreak havoc with work, relationships and overall quality of life.

“There are few accessible evidence-based treatments for BED,” says Laura Dixon, an NSHA research assistant and Dalhousie graduate student with the Department of Psychiatry. “We want to build evidence for an approach that combines group therapy with self-help to empower people to overcome urges to binge.”

The NSHA Research Fund has awarded Dixon and her team a grant to test their approach. It is based on a self-help program called Brain Over Binge that teaches the importance of non-restrictive eating and four key steps to changing binge-eating behavior: view the urge as “neurological junk”; separate the urge from your authentic self; do not react to the urge; and, detach from the urge.

“We’ve added group therapy to provide support and accountability,” says Dixon. “Participants will take part in three group sessions over eight weeks; we’ll follow up halfway through, at the end, and one year later to see how people are doing.”

Another study is addressing bulimia nervosa (BN), an eating disorder in which sufferers cannot bear to keep

food energy in their bodies so they induce vomiting, use laxatives or over-exercise to rid themselves of it.

Psychiatrist Dr. Aaron Keshen has designed a clinical trial to see if Vyvanse, a stimulant used to treat attention-deficit disorders, can reduce the urge to binge and purge in BN.

Dr. Keshen decided to test the concept in a larger clinical study, which first required Health Canada approval for the off-label use, as well as approval from the NSHA Research Ethics Board. This was granted, as was funding from the NSHA Research Fund, to proceed with a pilot involving 30 BN patients.

**“I had noticed that bingeing, purging and other symptoms were improved in my BN patients who were on Vyvanse for ADHD,” notes Dr. Keshen. “So I treated a handful of BN patients, off-label, with very encouraging results.”**

“We will not enroll patients who have a history of anorexia or low body mass index, cardiac risks or electrolyte imbalances,” says Dr. Keshen, noting that Vyvanse can suppress appetite in some. “But for those patients who can safely take it, a short course of the medication may help break the habitual patterns and give us an opportunity to help them be more successful in talk therapy.”



*The growing eating disorders team at NSHA, left to right: Dr. Aaron Keshen, Thomas Helson, Sarrah Ali & Laura Dixon*



# Targeted Approaches to Mental Illness

## Brain in a dish: Neuron cultures offer hope for more effective bipolar treatments

It may seem like science fiction to take a person's cells—from almost any tissue—and turn them into stem cells and then engineer those stem cells into neurons. But this is exactly what researchers at the Salk Institute in California are up to—and NSHA psychiatrist Dr. Martin Alda is working with them, in his quest to better understand and treat bipolar disorder.

“We have found that nerve cells engineered from the cells of people with bipolar disorder are hyper-excitable,” Dr. Alda says. “Their electrical activity is three times higher than the nerve cells engineered from people without the illness.”

**Lithium, fortunately, is remarkably successful in stabilizing the disorder—even after years of illness—in about one third of the people who have it. These are the “lithium responders.”**

Bipolar disorder is a very serious mental illness characterized by alternating phases of mania and depression. In manic phases, people develop grandiose delusions that can lead to such damaging behaviours as spending or gambling away all of their money. In depressive phases, suicide risk is extremely high.

“When we added lithium to hyper-excited neurons from lithium responders, the electrical activity settled right down,” notes Dr. Alda. “But when we added lithium to the neurons from patients who do not respond, there was no effect.”

While this result is not surprising, it IS powerful. “Now we have an objective way to see if someone is a lithium responder or not,” says Dr. Alda. “This will save a lot of time in trial and error to get people stabilized faster.”

The technology is not yet ready for large-scale use, but Dr. Alda is working with colleagues at the Montreal Neurological Institute to develop a clinical test. And, he's part of an international consortium that's developing a platform for high-throughput drug testing.

“We need to identify effective agents for the 70 per cent of bipolar patients who do NOT respond to lithium,” he says. “There are thousands of proven safe agents that have never been tested for bipolar disorder, as well as new agents yet to be discovered or created—now we can test them in a petri dish model of bipolar disorder.”

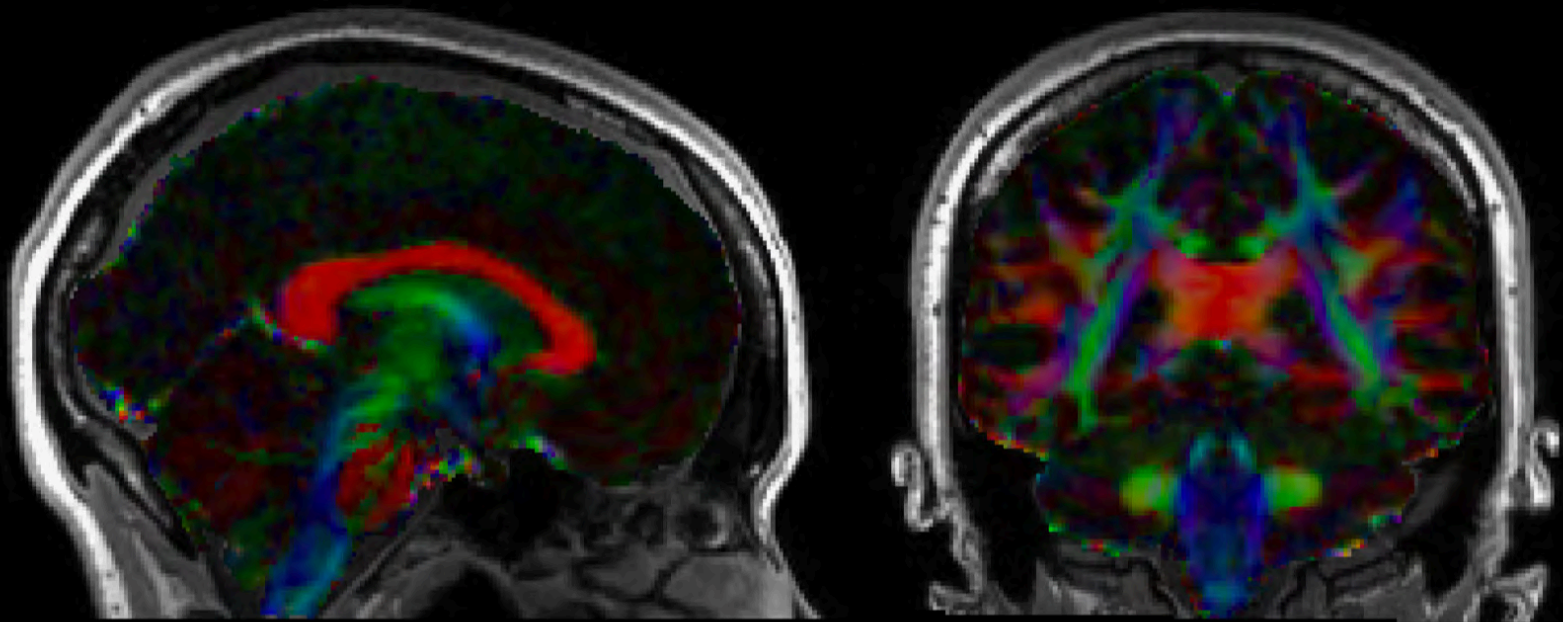
Such a technology opens the door to the possibility of tailored treatments, literally targeted to an individual's own particular version of bipolar disorder.

For Dr. Alda—a leading researcher in bipolar disorder for nearly 30 years—this is the kind of breakthrough that could scarcely be imagined even a decade ago.

Now, it is clearly within reach.



*Dr. Martin Alda in his Halifax office with the Mogens Schou Award for Research from the International Society for Bipolar Disorders*



## Understanding the Many Effects of Cannabis

### Youth & cannabis are a dangerous mix: Early regular exposure interferes with brain development, increases mental health risk

Brain imaging studies underway at NSHA are shedding light on how cannabis affects the young, still-developing brain.

“The brain does not finish developing until the mid-20s,” notes lead researcher, psychiatrist Dr. Phil Tibbo. “Our research is revealing how cannabis interferes with this process.”

Dr. Tibbo’s research team aims to understand how cannabis—particularly THC, the cannabinoid that produces the psychoactive high—weakens neural connections in the developing brain. These weakened connections make young cannabis users more vulnerable to serious mental health problems like schizophrenia.

“Early exposure to cannabis magnifies the risk of psychosis by four to twelve times,” says Dr. Tibbo, explaining that psychotic episodes (in which a person loses touch with reality) are an early symptom of schizophrenia. “The degree of risk varies depending on family history of mental illness, how young the person started using, how often they use, and how high the percentage of THC in the cannabis they use.”

#### The white-matter connection

Brain-imaging studies have shown high concentrations of cannabinoid receptors in the white matter of young people’s brains, compared to older adults. White matter—comprised of cable-like bundles of nerve fibres (axons) insulated by a protective sheath of fatty tissue (myelin)—connects the various regions of the brain.

“Cannabinoid receptors in the white matter are designed to work with endocannabinoids, chemicals our brains produce naturally,” Dr. Tibbo says. “Endocannabinoids play a vital role in the normal completion of the brain development process.”

Unfortunately, when the body’s own endocannabinoids are replaced with cannabinoids from an outside source—namely, the cannabis plant—brain chemistry is thrown out of balance and brain development does not complete properly.

“Early, regular cannabis exposure can change the microstructure of the white matter,” Dr. Tibbo explains.

*Above: Researchers in Halifax, NS and London, ON are using advanced brain imaging techniques to examine the white matter of the brain. Their CIHR funded study is one of the first like it in Canada and it will allow researchers to further understand white matter abnormalities associated with cannabis use and the effects of medication on the white matter of the brain.*



## Harnessing the Pain-Relief Power of Cannabinoids

NSHA clinicians and scientific colleagues at Dalhousie have been studying cannabinoids and their receptors for more than 20 years, to harness the pain-relieving power of cannabinoids in safe and effective products.

“Cannabinoids have proven to be profoundly analgesic in acute and chronic pain, both neuropathic and inflammatory,” says Dr. Mary Lynch, director of research at the QEII Pain Management Clinic. She co-founded Panag Pharma with anesthesiologists Dr. Orlando Hung & Dr. Christian Lehmann and pharmacology researcher Dr. Melanie Kelly, in 2014.

So far the company has developed THC-free topical creams for arthritis, as well as drops to combat pain and inflammation in the eye.

“Topical products are safer than oral medications and can target pain without the side effects of non-steroidal anti-inflammatories or other systemic medications given,” notes Dr. Lynch.

NSHA anesthesiologist Dr. Karim Mukhida is running a clinical trial of the company’s first product—a topical cream using cannabinoids derived from clover—to see if the cream relieves pain in patients with osteoarthritis of the knee.

“Instead of the axons lining up in uniform bundles of fibres all running in the same direction, we see cross-hatching fibres that impede the flow of electrical signals through the white matter.”

### New directions in brain imaging

Dr. Tibbo and his team are working with the Biomedical Translational Imaging Centre (BIOTIC) at the QEII Health Sciences Centre and collaborators in London, ON, to launch a \$495,000 Canadian Institutes of Health Research-funded study. This will use new brain-imaging protocols to examine the white matter of four groups of young people: patients with early-phase psychosis who regularly use cannabis, those who do not, volunteers with no diagnosed mental illness who regularly use cannabis and those who do not.

**“Given the strength of some of today’s strains—as high as 20 to 30 per cent THC, —there is a huge need for continued research support and education.”**

“We will be one of the first groups in Canada to use this new analysis method in a mental health study,” notes Dr. Tibbo. “It will allow us to uncover and understand the white matter abnormalities associated with cannabis use

in early-phase psychosis, separate from the illness effects and cannabis effects alone.”

Advanced brain imaging techniques also position the researchers to assess the effects of medications on the white matter of the brain—for example, new agents to help with myelin repair. “It may be possible to reverse the effects of cannabis on the white matter, if the structural changes are identified and treated early enough,” Dr. Tibbo says. “This could prevent an enormous amount of suffering and dysfunction.”

### The politics of cannabis

The legalization of cannabis for recreational use has opened up the conversation and the ability to study the effects of the dozens of compounds found within the plant, says Dr. Tibbo, who presented his work on the ties between early cannabis use and psychosis/schizophrenia to the Canadian Senate.

“Some cannabinoids may be beneficial, but THC is not one of them when it comes to the developing brain,” he says. “It is the primary psychoactive component that disrupts the white matter in young users. Given the strength of some of today’s strains—as high as 20 to 30 per cent THC, compared to 1.5 per cent in the 1970s—there is a huge need for continued research support and education.”

# Proactive Pain Management

## Taking a pre-emptive strike against post-operative pain

NSHA anesthesiologists and orthopedic surgeons want to ease the post-operative discomfort of a particularly painful procedure, the arthroscopic rotator cuff repair.

“This is a common shoulder surgery, which is very painful for many people,” notes Dr. Vishal Uppal, the anesthesiologist who is leading the study. “We are testing a new protocol to see if giving patients a single pre-emptive dose of an opioid painkiller to take after they get home will prevent the pain from getting out of control.”

As Dr. Uppal explains, once pain really kicks in, it is difficult to bring it under control and patients may require more painkillers. It is far safer and more effective to prevent the pain from getting that bad in the first place.

Minimizing pain during and immediately after surgery is the crucial first step, of course. In addition to general anesthesia, patients undergoing arthroscopic shoulder surgery also receive a local nerve block that freezes the shoulder for six to eight hours.

“The local nerve block reduces the amount of anesthetic required during the surgery, which is very beneficial,” Dr. Uppal says. “It reduces anesthesia side effects such as, nausea, vomiting, itching and breathing issues.”

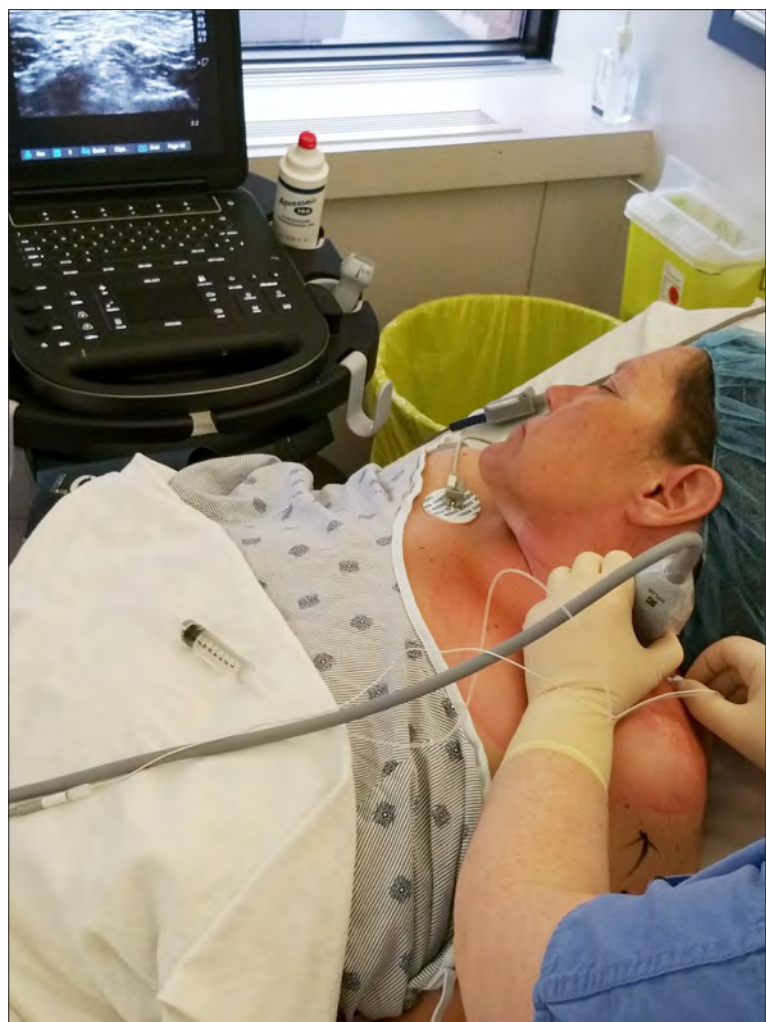
The lack of potential anesthesia complications also makes it possible for patients to go home within a few hours of the outpatient surgery. The problem is, by this time, the nerve block is wearing off.

“Now the patient may be in a lot of pain and it can be very difficult to get ahead of that pain and bring it under control,” says Dr. Uppal, noting that these patients would typically have only over-the-counter pain medications like acetaminophen, ibuprofen and naproxen at their disposal. As a result, patients may end up in their doctor’s office or an emergency room, seeking a prescription for relief. “But now the pain may be more intense and they may need a fair bit of opioid painkiller to bring it under control.”

Dr. Uppal, Dr. Janny Ke (anesthesia resident) and his collaborators, including Dr. Andrew Trenholm in the Division of Orthopedic Surgery, have an NSHA Research Fund grant to test the pre-emptive dose of opioid—compared to a placebo—in a two-year trial involving 70 patients undergoing arthroscopic shoulder surgery.

“They will fill in a pain diary and we will call them to check on how they are doing with their pain,” Dr. Uppal says.

**“If it proves effective, we will have paved the way to a safe and effective strategy for safely heading off pain at the pass.”**



*Samantha Muise receives a nerve block before her shoulder surgery. As part of the study patients are given a pre-emptive dose of an opioid pain killer to take at home when the nerve block wears off.*

# Harm Reduction in Hospital

## Safe and compassionate care for IV drug users in hospital

When a person who is addicted to intravenous drugs lands in hospital with a serious health issue, staff have a double-barrelled crisis on their hands: now, they have a patient who is medically unstable due to illness and also at risk of life-threatening opioid withdrawal.

Dr. Tommy Brothers, a second-year resident in internal medicine, is leading a new NSHA Research Fund-supported study to examine how such cases have been handled in the past. This is the crucial first step

**"...the evidence is clear— these interventions prevent infections and save lives."**



*Dr. Tommy Brothers works closely with Natasha Touesnard of HANDUP (Halifax Area Network for Drug Using People) to develop harm reduction approaches to health care*

toward developing a plan to provide the best patient-centred, evidence-based care to patients in this perilous situation.

"There's some consternation about how to manage IV-drug-using patients in hospital for a serious illness," Dr. Brothers notes. "Health care professionals may feel it's enabling someone's addiction to provide them with clean needles and a safe place to inject, for example, and/or to provide them with an opioid-replacement like methadone or buprenorphine, to prevent a withdrawal crisis. But the evidence is clear— these interventions prevent infections and save lives."

Dr. Brothers is reviewing the charts of all the people who've been treated for endocarditis who inject drugs at the QEII Health Sciences Centre over the past five years.

"About 40 per cent of people who develop endocarditis are IV drug users," he explains, noting that the use of dirty needles allows bacteria to travel through the bloodstream and lodge in the heart valves, which become infected. Intravenous antibiotics are required to halt the infection; in some cases, the valves are so damaged by the infection, they must be replaced to save the person's life.

"I want to know what happened with these patients," he says. "Who had opioid withdrawal and how was that managed? Was anyone found injecting in the bathroom? Were people tested for HIV and hepatitis? Offered methadone? Referred to psych?"

Once he has a clear picture of how these patients were managed, Dr. Brothers plans to interview former patients and clinicians about their perception of the problem and how solutions might best be introduced. His aim is to introduce harm reduction protocols for all people who use IV drugs, complete with education for clinicians, to ensure the best outcomes for patients.

"If these patients are approached with compassion and offered a way to manage their withdrawal symptoms, a stay in the hospital could be a positive turning point in their lives," says Dr. Brothers, who is collaborating with HANDUP on the project. "If not, their condition could easily worsen."



# Facing Terminal Cancer with Honesty & Courage

Zones collaborate to ensure cancer patients understand their cancer treatment



*Oncology manager Kelly Murray & cancer patient navigator Bonita McCarron discuss treatments with patient Lloyd Cornett*

What started as a quality improvement project at St. Martha's Regional Hospital in Antigonish (Eastern Zone) has expanded into a collaborative research project based at the Aberdeen Hospital in New Glasgow (Northern Zone), involving Halifax-based researcher, Dr. Robin Urquhart (Central Zone).

The goal of the project is to see if a short survey can effectively guide oncologists in their discussions with cancer patients, so that patients truly understand the intended purpose of their chemotherapy regimen.

Confusion arises in patients with advanced cancer who are receiving "palliative chemotherapy." These therapies are designed to reduce tumour load, minimize symptoms and extend life—for months or potentially several years—when a cure is not possible.

"Because they're getting chemo, many patients mistakenly believe the purpose of the treatment is to cure their cancer," notes Dr. Urquhart, who works extensively in the area of communication skills in cancer care. "This is not helpful to them or their families when the cancer has advanced past the possibility of cure. Our research clearly shows that patients and caregivers overwhelmingly want to know the truth about their situation, so they can prepare."

Heather Brander, the cancer patient navigator who coordinated the project to improve communication with patients at St. Martha's, shared her enthusiasm with her counterpart at the Aberdeen, Bonnie McCarron. The

two approached Dr. Urquhart to help devise a research project that would allow them to further develop and validate the survey with the aim of eventually being rolled out across the province. Kelly Murray, health services manager responsible for oncology at the Aberdeen, came on board as co-lead with Dr. Urquhart on a successful QEII Foundation funded TRIC grant application. Dr. Ron MacCormick, oncologist at the Cape Breton Cancer Centre, is advising the team.

"First we are going to survey patients to gauge their understanding of their treatment goals," notes McCarron. "We will then introduce the intervention, a survey that patients and oncologists complete so we can see if they're on the same page. At St. Martha's they found that the survey prompted oncologists to be very clear in their discussions with patients, so patients understood the goals of care. We hope to see similar improvements."

The researchers will also interview patients and oncologists after their goals-of-care discussions, to evaluate the quality of the conversations and explore what improvements could be made to ensure patients receive complete and honest information, with sensitivity and compassion.

"It's a simple yet powerful project," notes Urquhart. "Accurate awareness of prognosis is known to improve quality of life for both the patients and their caregivers. It doesn't take their hope away... it changes where the hope lies."

# Preventing Post-Operative Complications

Halifax-led project finds Aspirin prevents post-op clots as well as prescription drug



*Dr. David Anderson & Dr. Michael Dunbar*

Thanks to the efforts of a large team at NSHA and Dalhousie Medical School, Aspirin is now proven to be just as effective as the prescription anticoagulant drug, rivaroxaban, in preventing blood clots after hip and knee replacement surgery.

These are the results of a four-year, Halifax-led, cross-Canada clinical trial involving more than 3,400 patients recovering from hip or knee replacement surgery. The patients were randomly sorted into two groups—half were given Aspirin (ASA), half rivaroxaban. Surgeons following the patients' recoveries found little difference in the occurrence of clots in the legs or lungs or bleeding complications at the incision site, between the two groups.

**“The drugs are equally safe and effective,” says study lead, Dr. David Anderson. “This finding will have an international impact on practice.”**

The *New England Journal of Medicine* published the results of the study—funded with \$3 million from the Canadian Institutes of Health Research—in March 2018.

Dr. Anderson, NSHA hematologist and dean of medicine at Dalhousie, co-led the study with five local orthopedic surgeons: Dr. Michael Dunbar, Dr. Ross Leighton, Dr. David Amirault, Dr. Glen Richardson and Dr. Gerry Reardon.

Susan Pleasance, associate director of hematology research at NSHA, led the team that organized and executed the study, which involved 15 university-affiliated health centres across Canada. NSHA's Research Methods Unit played a key role in designing the analytical framework and overseeing the data collection and preparation for analysis.

“The study was designed and run entirely out of this organization in Halifax,” notes Dr. Anderson. “That’s a big deal... it’s a multi-million dollar endeavour and it’s very complex. Kudos to the team here.”

Blood clots are a known risk after hip and knee surgery and, if a clot travels to the lungs, it can be fatal (pulmonary embolism). “Rates of post-op blood clots have been around one or two per cent, historically,” says Dr. Dunbar, who invited orthopedic surgeons from across Canada to the study. “Anticoagulant agents like rivaroxaban can reduce the risk below one per cent, but these agents are often associated with significant bleeding risks.”

With their similar risk-benefit profiles, what then is the advantage of Aspirin over rivaroxaban? In a word: cost. Rivaroxaban costs dollars a day, while Aspirin mere pennies. As Dr. Anderson says, “This really does help the patients and the overall health care system as a more affordable and equally safe and effective means of preventing blood clots.”

# Nova Scotia Health Authority Research Fund Awards

## September 2017 Nova Scotia Health Authority Research Fund Award Recipients

Name	Department	Award	Research Description
Laura Dixon	Psychiatry	\$4,971	Binge Focused Therapy: Examining an Accessible, Cost-Effective, Guided Self-Help, Group-Based Approach for the Treatment of Binge Eating Disorder
Judith Godin	Geriatric Medicine	\$25,000	Social and Occupational Factors throughout the Life Course: What Matters for Health at Older Ages
Todd Hatchette	Pathology and Lab Medicine	\$21,876	Two EIA Algorithm for the Serological Diagnosis of Lyme Disease
Aaron Keshen	Psychiatry	\$49,989	A Feasibility Study to Evaluate Lisdexamfetamine Dimesylate (Vyvanse) in Adults with Bulimia Nervosa
Sarah Kraeutner	Psychology	\$5,000	Exploring the Evolution of Motor Imagery-Based Learning to Leverage its Effects in Rehabilitation Post-Stroke: A Pilot Study
Logan Lawrence	PhD Health	\$5,000	Health Policy Capacity in Nova Scotia: Framework Adaptation and Testing
Philip Moss	Pathology	\$5,000	Determination of Optimal Immunohistochemical Panel to Distinguish Merkel Cell Carcinoma from Extracutaneous Small Cell Neuroendocrine Carcinoma
Vishal Uppal	Anesthesiology	\$25,000	Preventing Rebound Pain after Arthroscopic Rotator Cuff Repair under General Anesthesia and Intrascapular Block: An RC Trial of Pre-Emptive Opioid Treatment Compared to Placebo
Tallal Younis	Medical Oncology	\$24,940	Endocrine Strategies for Breast Cancer Prevention in Postmenopausal Women

## March 2018 Nova Scotia Health Authority Research Fund Award Recipients

Name	Department	Award	Research Description
Katie Aubrecht	Continuing Care	\$1,200	A Protocol to Support Integrated Dementia and Mental Health Care for Older Adults: Developing an Evidence Base from a Comparative Case Study Analysis of Two NSHA Zones
Leah Cahill	Medicine	\$50,000	Eating Frequency & Timing as a Predictor of Incident Coronary Heart Disease in Multiple Independent Prospective Cohort Studies
John Hanly	Rheumatology	\$25,000	Blood-Brain-Barrier and Cognitive Dysfunction in SLE
Jong Kim	CH&E	\$25,000	Arsenic Speciation Profiling for Evaluating the Association between Cancer and Arsenic Exposure Using Toenail Biomarkers in the Atlantic PATH Cohort Study: Feasibility and Preliminary Health Outcomes
Rebecca Moyer	Orthopedics	\$25,000	Do Walking Patterns Influence the Effect of a 30-minute Continuous Walk on Imaging Markers of Disease Progression in Patients with Knee Osteoarthritis?
Ferhan Siddiqi	Endocrinology	\$25,000	Assessing the Clinical Prevalence and Epigenetic Signatures of Early Progressive Renal Decline in Type 1 Diabetes: A Preliminary Study



# Patrick McGrath Research & Innovation Student Award

## Congratulations Ryan DeCoste!



Dr. Patrick McGrath & Janet Knox at a special luncheon



Ryan DeCoste & Dr. Patrick McGrath

The **Patrick McGrath Research & Innovation Student Award** was created in 2017 to recognize Dr. Patrick McGrath's significant contributions to the Nova Scotia Health Authority and announced at a special luncheon. Dr. Patrick McGrath was the Vice President of Research, Innovation & Knowledge Translation at NSHA from 2012 until 2017. He is the recipient of the Governor General's Award for Innovation, HealthCareCan's Legacy of Leadership Award, the Ernest C. Manning Foundation Principal Award, a Fellow of the Royal Society of Canada and Canadian Academy of Health Sciences and is an Officer of the Order of Canada.

This onetime \$5,000 Award is presented to the trainee with the highest ranked application from the 2018 NSHA Research Fund competition: **Ryan DeCoste**.

Ryan was also awarded \$5,000 from the NSHA Research Fund for his project: *"PAXgene Fixation for Pancreatic Cancer Molecular Research and Diagnostic Surgical Pathology: Comparing Fresh Frozen, Formalin-Fixed Paraffin-Embedded and PAXgene-Fixed Paraffin-Embedded Tissue"*.

Ryan's project compares different methods of preserving tissue samples that are used for cancer diagnosis. Finding the optimal solution is important; examining the DNA and RNA in the samples are key to genetic analysis and some storage solutions may degrade the DNA and RNA. Results from this study can inform pathologists and different protocols for tissue storage could be developed depending on the type of diagnosis required.

### NSHA Research Fund Committee

#### Dr. Kim Good & Dr. Gordon Gubitz, Co-Chairs

Dr. Stacy Ackroyd  
Dr. Jillian Banfield  
Dr. Lisa Barrett  
Dr. Steven Beyea  
Dr. Jeremy Brown  
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Dr. Cynthia Calkin

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Dr. Dan Gaston  
Dr. Ron George  
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Dr. Wenda Greer  
Dr. Todd Hatchette  
Dr. Chris Kenyon  
Olga Kits  
Dr. Jason LeBlanc  
Dr. Emily Marshall  
Dr. Paige Moorhouse

Heather Neville  
Dr. Jennifer Payne  
Dr. Madelaine Plourde  
Dr. Gabrielle Richard  
Dr. Jai Shankar  
Amanda Tinning  
Dr. Robin Urquhart

# Translating Research Into Care (TRIC) Awards

The Translating Research Into Care (TRIC) health care improvement research program was established in 2013 with funding from the QEII Foundation and the IWK Foundation. The funding program supports research that will provide evidence and facilitate the translation of clinical science into improved health care policy, service delivery and patient care at the QEII Health Sciences Centre, the IWK Health Centre and across NSHA.

## May 2017 TRIC Award Recipients

Name	Award	Research Description
Jacqueline Gahagan & Ashley Harnish	Level 1 \$2,931	Improving Timely Care and Access for Trans* and Gender Diverse Populations in Primary Health Care-Central Zone: An Exploratory Study
Matthew Rigby, Laurette Geldenhuys & Colleen Caines	Level 3 \$59,700	Implementation of an Intraoperative Margin Assessment Protocol in Head and Neck Cancer Surgery
Michael Vallis, Lynn Edwards & Janelle Comeau	Level 3 \$60,000	Supporting Psychosocial Distress in Diabetes Care: a Patient-Centred Integrated Care Management Initiative

## November 2017 TRIC Award Recipients

Name	Award	Research Description
Leah Cahill & Brenda MacDonald	Level 1 \$2,999	Uniting Clinical, Patient and Research Efforts in an Environmental Scan of Nutrition Screening and Assessment Tools
Robin Urquhart & Kelly Murray	Level 1 \$2,999	Improving Patients' Understanding of Goals of Cancer Treatment

## TRIC Grant Review Committee

### Dr. Erna Snelgrove-Clarke & Victoria vanHemert, Co-Chairs

Dr. Melissa Andrew	Jevon MacDonald
Pam Davidson	Jim MacLean
Dr. Amy Grant	Dr. Lidija Marusic
Mary Ellen Gurnham	Randi Monroe
Jeff Harding	Dr. Nathalie St-Jacques
Dr. Jill Hatchette	Bradley Osmond
Dr. Jill Hayden	Dr. Phil Tibbo
Dr. Christine Herman	Dr. Robin Urquhart
Natalie Jarvis	

*TRIC Program funding provided by:*



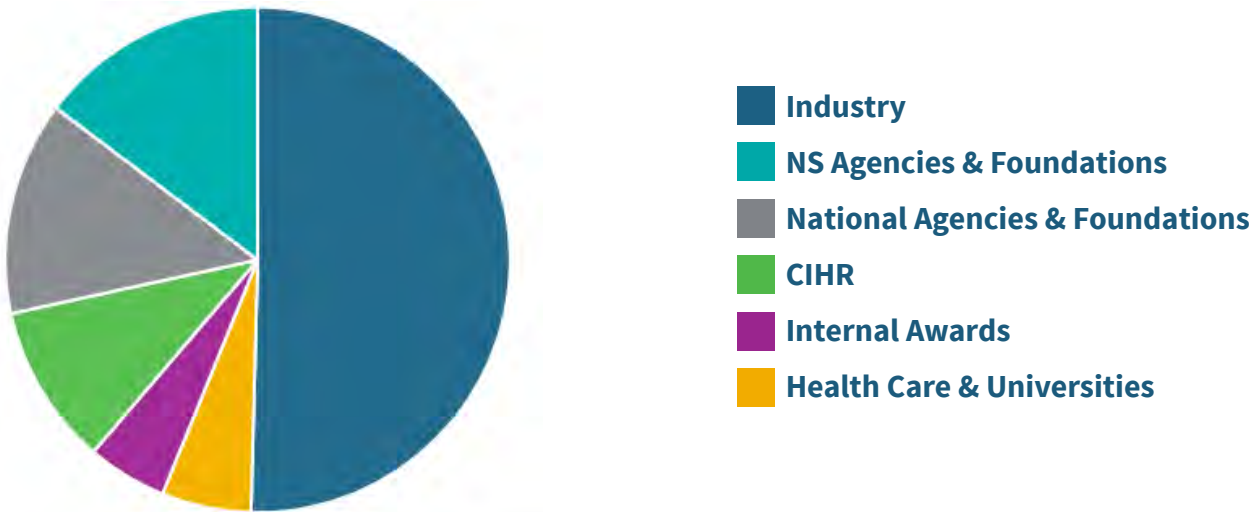
# Awards for Research Conducted at NSHA

## 2017-2018 Fiscal Year

	Administered at NSHA	Administered at Dalhousie University
Research Grants	\$ 12,777,502.95	\$ 2,482,052.88
Research Contracts	\$ 11,603,323.73	\$ 75,654.81
Total	\$ 24,380,826.68	\$ 2,557,707.69
Total: \$ 26,938,534.37		

# Source of Awards for Research Conducted at NSHA

## 2017-2018 Fiscal Year





## Statement of Revenue and Expenses for the Twelve Months Ended March 31, 2018

	Actuals 17/18		Actuals 16/17	Variance
<b>Opening Balance April 1</b>	<b>37,135,939</b>	<b>\$</b>	<b>35,431,210</b>	
<b>Revenue</b>				
Grants*	13,950,422		11,249,614	2,700,808
Contracts*	7,989,999		8,161,342	(171,343)
Interest and Realized Gain on Investments	2,474,458		1,217,241	1,257,217
Federal Research Support Program	928,809		938,463	(9,654)
Donations & Other Revenue	615,764		302,850	312,914
Ethics Review Fee	210,000		252,000	(42,000)
RMU Consulting Fee	105,600		104,700	900
Record Retention Fee	44,715		56,334	(11,618)
<b>Gross Revenue</b>	<b>26,319,767</b>	<b>\$</b>	<b>22,282,543</b>	<b>\$ 4,037,225</b>
<b>Expenses</b>				
<b>Compensation</b>	<b>13,499,285</b>		<b>14,715,367</b>	<b>1,216,082</b>
<b>Supplies and Services Expenses</b>				
Transfers Offsite	2,925,148		2,026,636	(898,512)
Purchased Services/Professional Fees	1,191,952		1,791,519	599,567
Clinical Laboratory Services	415,142		828,333	413,191
Overhead to Dalhousie	708,929		707,022	(1,907)
Travel/Professional Development	678,673		567,409	(111,264)
Other Expenses (Schedule 1)	365,492		453,406	87,913
Diagnostic Imaging Services	579,598		348,647	(230,951)
Printing/Office and Computer Supplies	215,276		319,510	104,235
Pharmacy Services and Drugs	364,813		308,495	(56,319)
Travel-Patient	278,320		292,395	14,074
Equipment	295,144		264,689	(30,455)
Maintenance	297,116		223,349	(73,767)
Medical/Surgical Supplies	147,834		191,285	43,452
Communications	53,884		48,652	(5,232)
Recoveries of Expenses**	(344,710)		(289,055)	55,654
	<b>8,172,610</b>		<b>8,082,290</b>	<b>(90,320)</b>
<b>Total Expenses</b>	<b>21,671,895</b>		<b>22,797,657</b>	<b>\$ 1,125,762</b>
<b>Net Inflow/Outflow</b>	<b>4,647,872</b>		<b>(515,115)</b>	<b>5,162,987</b>
<b>Unrealized Gain (Loss) on Investments</b>	<b>565,887</b>		<b>2,219,844</b>	<b>1,653,958</b>
<b>Ending Balance March 31, 2018</b>	<b>42,349,698</b>	<b>\$</b>	<b>37,135,939</b>	<b>\$ 5,213,759</b>

### Overhead Distribution

	17/18	16/17	Variance
NSHA Research Services	1,240,871	985,941	254,930
NSHA Research Development	311,523	217,325	94,198
University Departments	382,822	373,988	8,834
Faculty of Medicine, Dalhousie University	326,107	249,456	76,651
<b>Total Overhead</b>	<b>2,261,323</b>	<b>1,826,711</b>	<b>434,612</b>

\* Includes overhead

\*\* Recoveries allocated to appropriate grant/contract; balance attributed to hospital department recoveries

# Research Services & Research Ethics Board (REB)

## Dr. Thomas Marrie

Interim Vice President Research, Innovation  
& Knowledge Translation  
Nova Scotia Health Authority

Sheryl-Lynn Forward, Executive Assistant



## Research Services Staff

### Lisa Underwood, Director

Michelle Roden, Administrative Assistant

Alicia Benton, Coordinator, Contract Facilitation & Support  
Jennifer Thurlow, Coordinator, Grant Facilitation & Support  
Stacey Pyke, Administrative Coordinator, Contracts & Grants  
Jayne Sierens, Coordinator, Institutional Awards

Andrea Dean, Program Manager, Research Education  
Julia Enikeeva, Program Manager, Research Quality  
Judith Thompson, People Services Manager  
Amy Wilson, Publications Coordinator  
Katie McIsaac, Health Outcomes Scientist

### Research Financial Services

Dave Denman, Manager, Research  
Jane MacLeod, Financial Analyst, Research  
Steven Cromlish, Finance Clerk, Research

### Research Development and Planning

Sandra Crowell, Program Leader  
Elaine Strohm, Administrative Assistant

### Zone Research Facilitators

Chrissy Boyle, Eastern Zone  
Robin Latta, Northern Zone  
Daniel Marsh, Western Zone

### Research Methods Unit (RMU)

Daniela Meier, Manager  
Sandra Pauls, Finance & Administrative Officer  
Prosper Koto, Health Economist  
Steve Doucette, Senior Biostatistician  
Joe Fraser, Research Database Specialist  
Olga Kits, Qualitative Methodologist  
Kara Matheson, Biostatistician  
Chris Theriault, Senior Research Database Specialist

## Research Ethics Board (REB)

### Research Ethics Board Executive:

Dr. Chris MacKnight, Executive Chair  
Dylana Arsenault, Co-Chair  
Dr. Helena Piccinini-Vallis, Co-Chair  
Dr. Andrew Jarvie, Co-Chair  
Sue Pleasance, Co-Chair  
Dr. Osama Loubani, Co-Chair  
Dr. Anne Marie Crueger-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

### Ken Jenkins, Manager

Nadine Ransome, Administrative Coordinator  
Starla Burns, Ethics Coordinator  
Moiria Fisher, Ethics Coordinator  
Joan Morrison, Ethics Coordinator  
Pamela Trenholm, Ethics Coordinator

*In addition to the NSHA Research Ethics Board executive and office staff, the board has 110 volunteer members. These members are drawn from the community, the legal profession, medical staff and hospital employees.*

The NSHA Research Annual Report is produced by NSHA Research Services:

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- Design & Photography – Amy Wilson

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