



# Capital Health Research Annual Report 2013-2014

# Contents

**Introduction, 3**

**Hearing and Balance Research Group, 4**

**Biomedical Translational Imaging Centre, 8**

**Orthopaedic Clinical Research and Validation, 12**

**Community Cardiovascular Hearts in Motion, 16**

**New Researcher Profile: Dr. Lisa Barrett, 20**

**Endowed Chair in Transplantation Research, 22**

**Research Education Program Meets the Need, 23**

**Capital Health Research Fund Awards, 24**

**Translating Research into Care (TRIC) Grants, 26**

**Financials, 28**

**Research Staff, Ethics Board and Research Fund Committee, 30**



In June, Capital Health and Dalhousie University celebrated a licensing agreement with Colibri Technologies to commercialize a new ear-imaging device. (L to R) Chris Power, CEO of Capital Health; Stephen Hartlen, Industry Liaison and Innovation, Dalhousie University; Dr. Rob Adamson, co-inventor of the device; Dr. Manohar Bance, the project's clinical lead; and Dr. Patrick McGrath, Integrated Vice President of Research and Innovation.

# High-impact research takes time, effort, money... and a spark of genius

## A message from Dr. Patrick McGrath

Much as we tend to think of scientists as bursting out with that “Eureka!” moment of discovery that changes everything, in reality, research is a much slower journey. Researchers take one carefully considered step at a time and accumulate evidence piece by piece along the way to eventually solve a mystery, prove a hypothesis, or demonstrate a new way of doing things.

In this year’s annual report, you will find stories about a number of large-scale research projects that have been in the works at Capital Health for several years. Each new discovery, investment, team member, piece of equipment, patent, clinical study, approval, commercial partner – the list goes on – has added substance, direction and momentum to these projects, which are now clearly on trajectories to tremendous success.

Thanks to the dedicated efforts of our researchers and their teams, the ongoing assistance of staff members throughout Capital Health, and the support of the charitable foundations, funding agencies, and private-sector partners, the projects outlined in this report are now yielding new programs and products with the potential to transform health services and outcomes not just in Nova Scotia but in other parts of Canada and the world. These include:

- a pocket-sized ear-imaging probe that gives clinicians their first tool for looking inside a patient’s middle and inner ear
- new MRI applications for improving diagnostic imaging of prostate cancer and liver disease and making brain surgery safer and more effective
- new technologies for cutting down wait times and improving the results of hip and knee-replacement surgeries
- a proven community-based program for reducing the risk of cardiovascular disease

We are particularly grateful to the QEII Foundation and the Atlantic Canada Opportunities Agency for their ongoing commitments to supporting large-scale, long-term research projects at Capital Health. As you will see, these projects are paving the way to significant improvements in patient care and quality of life, as well as important economic opportunities for Nova Scotia.

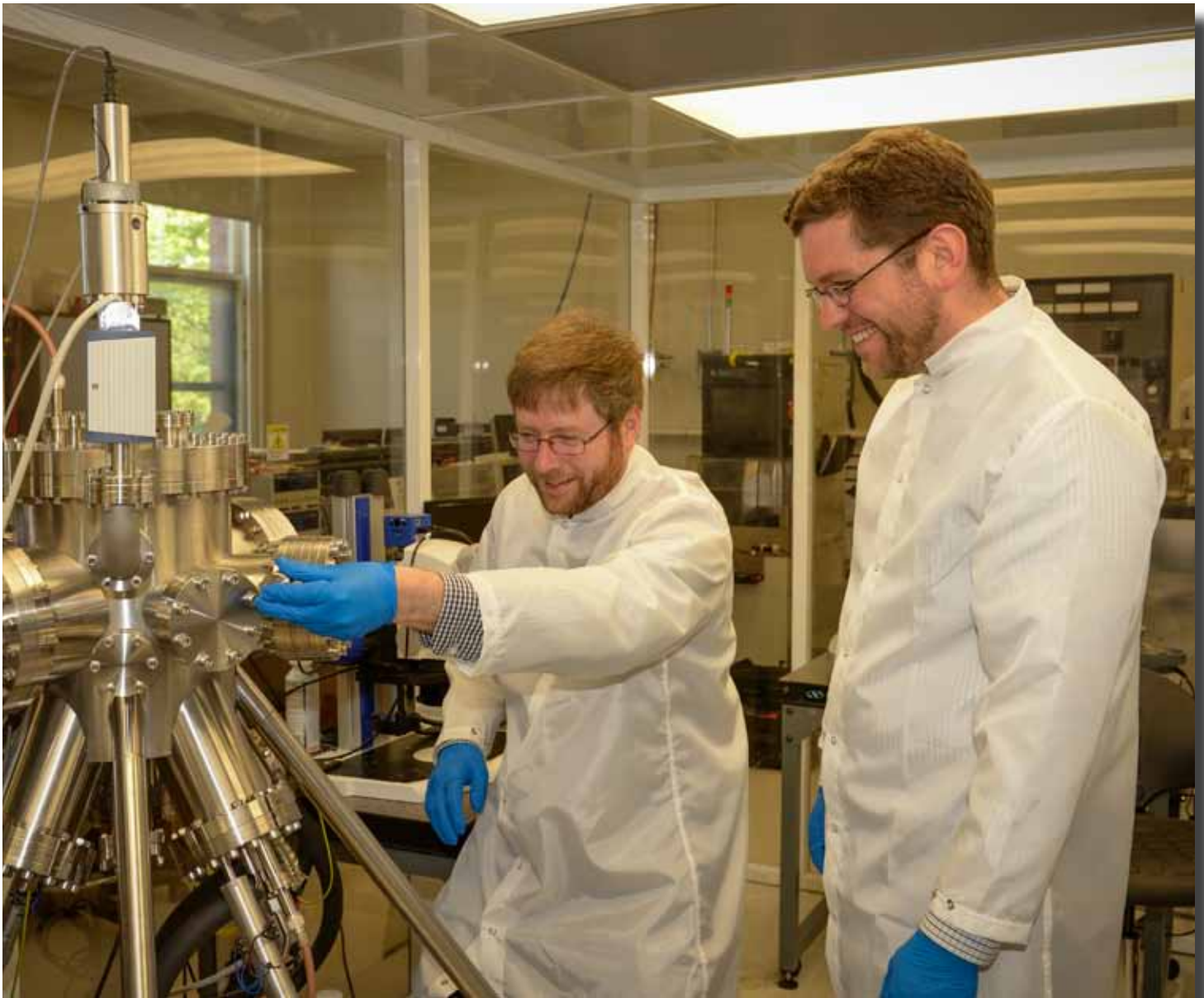
While it’s true that such sweeping improvements are the result of prolonged and determined efforts – rather than a single Eureka! moment – you will find, at the heart of each project, a spark of true genius. This is the revolutionary idea that motivates investigators and inspires their teams to put in the long hours, and generate and test even more brilliant ideas, to achieve the promise of a better way.



Patrick McGrath  
Integrated Vice President, Research and Innovation  
Capital Health and IWK Health Centre



## Hearing and Balance Research Group



Dr. Jeremy Brown (left) and Dr. Rob Adamson check on the status of an in-progress component of one of the new ear-imaging devices they're developing in the Microfabrication Lab at Capital Health.

### 2007-2008

Manohar Bance receives funding from the Atlantic Innovation Fund to develop bone-conduction hearing aids and creates grant-funded positions— filled by Jeremy Brown and Rob Adamson — to get the job done.

### 2009

Jeremy Brown receives Canada Foundation for Innovation, Springboard, NSERC and CIHR funding to equip the Microfabrication Lab.

### 2010

Discussions with Manohar Bance reveal the need for diagnostic ear-imaging technologies.

### 2011

Researchers receive funding from Atlantic Innovation Fund to develop ear-imaging technologies.

## A visionary ear-imaging technology

*A Capital Health ear specialist, two engineering physicists, and a team of students, postdoctoral fellows and research engineers, have developed a revolutionary device for seeing inside the middle and inner ear. Ontario-based Colibri Technologies has licensed the technology and plans to make it available around the world.*

Ear specialists will soon be able to use a small hand-held ultrasound probe to look deep inside the ears of people suffering from hearing loss, balance problems or ear pain. Developed at Capital Health and Dalhousie University, this is the world's first-ever tool for obtaining high-resolution images of the middle and inner ear.

"The interior structures of the ear are encased in solid bone, so it has always been a challenge to see what's happening when a patient presents with a hearing problem," notes Dr. Manohar Bance, a Capital Health ear surgeon and professor of otolaryngology at Dalhousie Medical School. "We've always had to enter the ear surgically to get a clear picture of the disease process and make an accurate diagnosis."

### A technological breakthrough

Dr. Bance provided his clinical perspective to the highly technical efforts of Dalhousie and Capital Health engineering physicists, Dr. Jeremy Brown and Dr. Rob Adamson, and their team, to develop the revolutionary probe.

"Our greatest challenge was to miniaturize the components, which are quite bulky in typical ultrasound devices, to create a powerful probe that slips easily

into the ear canal," notes lead inventor, Dr. Brown. "To do that, we adapted technology from the semiconductor industry to produce microscopic components."

The result is a pocket-sized probe that provides a resolution more than ten times higher than MRI or CT scans. "This makes it ideal for examining the tiny structures inside the ear, which you can't see with traditional imaging equipment," says Brown.

In addition to its use as a powerful, non-invasive diagnostic tool, Dr. Bance says the ear-imaging probe will open a new window on the mechanisms of ear problems. "It will reveal a great deal of new information about many middle and inner-ear disorders," he says. "This could lead to tremendous advances in treatment."

### From the lab to the community

Canadian ultrasound technology firm, Colibri Technologies Inc., has licensed the technology from Dalhousie University and plans to manufacture the new probe in its Toronto facilities.

"We see a major market opportunity for the ear-imaging probe in the global medical-imaging market," said Brian Courtney, president and CEO of Colibri Technologies, after the licensing agreement was announced in Halifax in June. "Unlike MRI or CT, it is small, portable and inexpensive, so it can be used widely in clinics to diagnose and monitor ear pathologies quickly, easily and non-invasively. On top of this, it has the potential to be adapted for use in cardiology, urology and other health care fields."

#### 2013

Working prototype of the ultrasound ear-imaging probe is complete; Colibri Technologies expresses interest.

#### 2014

Licensing agreement signed between Colibri Technologies, Dalhousie University and Capital Health.

#### 2015-2016

Pre-market clinical testing to fine tune the device before product launch.

## Hearing and Balance Research Group (continued)

### Investing in the future

Capital Health has led the \$3.8 million project to develop the probe, with an investment of \$2.6 million from the Atlantic Canada Opportunities Agency's Atlantic Innovation Fund (AIF). Other funders include NSERC, Canadian Institutes of Health Research, Innovacorp, Capital Health and Dalhousie. The licensing agreement, negotiated by Dalhousie Industry Liaison and Innovation, will return royalties to Capital Health and Dalhousie to be re-invested in local research.

The ultrasound probe is just one of many projects for Drs. Bance, Brown and Adamson. They've already developed and licensed subcutaneous bone-conduction hearing aids that could replace the more invasive bone-anchored aids. They hold more than a dozen patents on new technologies and co-own several companies, with ambitious plans for the future.

Beyond the technological and clinical advances, the research is providing employment and training opportunities for talented young people in Nova Scotia. "We employ a team of 12 students, post-docs and engineers, who are developing advanced technical skills and clinical experience," notes Dr. Brown. "On top of this, former students are running successful spin-off companies commercializing technologies from our lab, which offer even more potential for jobs in the future."

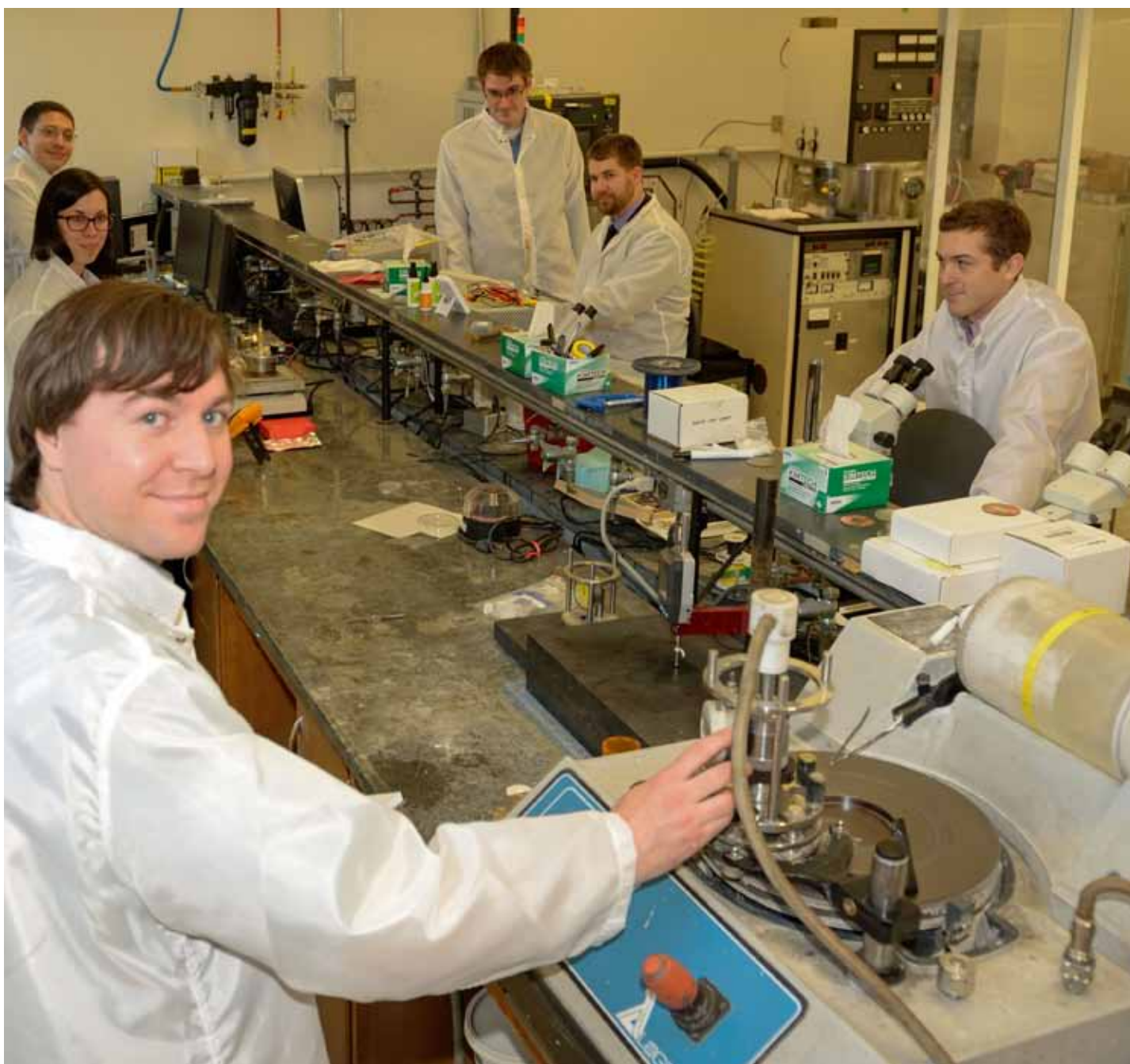


Dr. Manohar Bance explains the clinical benefits of the new ear-imaging probe at an event in June celebrating the licensing agreement with Colibri Technologies.

### *This research will:*

- *provide ear specialists with the first non-invasive tool for obtaining high-resolution images of the middle and inner ear*
- *improve the accuracy of diagnosis and effectiveness of treatment for ear disorders*
- *save costs for the health care system*
- *create jobs in Canada and Nova Scotia*
- *generate royalties to be re-invested in research at Capital Health and Dalhousie University*





Students, postdocs and research engineers fabricate and test microscopic components of new medical technologies in the Microfabrication Lab. (Left, back to front): Andre Bezanson, Kate Latham, Tom Landry; (right, back to front): Shane Grant, Craig Arthur, Chris Samson.

# Biomedical Translational Imaging Centre

## Turning MRI into a super-powered medical-imaging tool

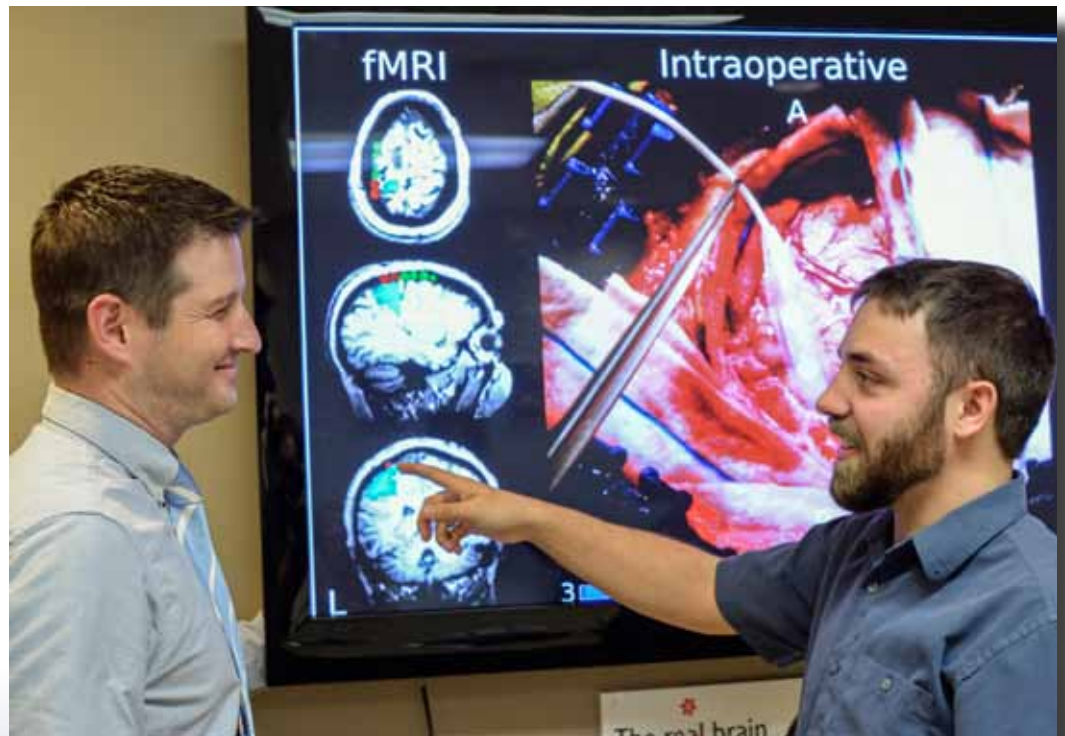
*Capital Health clinicians are working with researchers in the Biomedical Translational Imaging Centre (BIOTIC) to develop new applications that will dramatically enhance the speed, accuracy and meaning of diagnostic images gathered using MRI (magnetic resonance imaging). The team is on the cusp of finalizing a research and development agreement that could see these applications in use around the world.*

A typical MRI diagnostic-imaging session generates such massive volumes of raw data, a radiologist could pore over thousands of images, for hours, and still miss important clues embedded in the images.

“MRI currently produces information overload, some of it so obscure, you need a physicist to help analyze the data,” says Dr. Steven Beyea, a physicist in the Department of Diagnostic Radiology and scientific lead of BIOTIC. “We’re working on ways to transform MRI into a much more useful and user-friendly clinical tool.”

Dr. Beyea and the growing team of researchers at BIOTIC have been working on a series of computer algorithms that collapse and analyze mountains of MRI data to produce concise, easy-to-read reports that reveal the essential clinical information – literally at the push of a button.

PhD student Tynan Stevens shows Dr. Steven Beyea his progress toward more powerful computer algorithms for using MRI to map brain function before surgery.



### 2003

High-powered MRI installed in new National Research Council (NRC)-led imaging-research lab at QEII Health Sciences Centre.

### 2004

Steven Beyea and colleagues receive NSERC Discovery Grant to develop new diagnostic imaging technologies and begin work with NRC and Canadian hospitals to develop MRI-based functional brain-mapping technology.

### 2010

NRC and Elekta Neuromag partner with IWK Health Centre to open MEG lab and, with \$1.8 million from ACOA's Atlantic Innovation Fund (AIF), develop new brain-mapping applications for magnetoencephalography (MEG).





BIOTIC team members (L to R): Dr. Chris Bowen, Denise Lalanne, Dr. Steven Beyea, Tynan Stevens, Matt MacLellan, and Dr. Sharon Clarke, chart next steps in their work to develop powerful new applications for MRI.

“The results are fast, automatic, objective and readily comprehensible to clinicians,” says Dr. Beyea of the new MRI tools. “And there’s no room for human error.”

The clinical and commercial potential of these technologies is so vast, the QEII Foundation stepped in first with \$2.9 million, enabling BIOTIC to leverage another \$2.9 million from the Atlantic Canada Opportunities Agency Atlantic Innovation Fund (ACOA-AIF) to finalize three new MRI applications. Capital Health and a corporate

partner have also invested in the \$7.6 million project.

### Prostates, livers and brains

The BIOTIC researchers are working with Capital Health clinicians to develop new MRI applications for diagnostic imaging of three high-impact diseases: prostate cancer, fatty liver disease, and brain tumours.

Dr. Sharon Clarke, a radiologist with a PhD in medical biophysics who specializes in abdominal MRI, is the

## 2013

Capital Health and the IWK, with funding from the N.S. government and other stakeholders, take over operation of NRC imaging-research facilities at the two hospitals and unite them under the BIOTIC (Biomedical Translational Imaging Centre) umbrella.

## 2014

BIOTIC gains traction with numerous industrial partnerships – along with new funding from the AIF, QEII Foundation, Capital Health and a corporate partner to develop powerful new applications for MRI.

## 2014

A state-of-the-art high-field 3T MRI is installed in BIOTIC’s research facility at the QEII Health Sciences Centre. This technology opens the door to many new opportunities for medical and business development.

## Biomedical Translational Imaging Centre (continued)

clinical radiology lead for the prostate cancer and liver disease projects. “Prostate cancer and fatty liver disease are both prevalent in Canada,” she says. “We need better tools for diagnosing and monitoring these diseases.”

In prostate cancer, the researchers seek a definitive test of the cancer’s aggressiveness, so clinicians can choose the best way to manage the disease from a range of options, including radical surgery, radiation therapy, or active surveillance.

“At the moment, we’re developing algorithms for tracking the mobility, or diffusivity, of water molecules, and the perfusion of an injected contrast agent in the prostate – less-mobile water and more-rapid perfusion means more aggressive cancer,” notes Dr. Clarke. “We will use this information to develop the computer’s ability to differentiate between healthy and diseased tissues within the prostate.”

Fatty liver disease affects up to a third of Canadians. Dr. Clarke commonly sees fatty livers in her work as an abdominal radiologist and says, “Right now, we can’t tell what kinds of fat are there, or predict who’s at risk

of developing progressive liver disease that can lead to fibrosis, cirrhosis, liver cancer and even liver failure.” She adds, “If it’s diagnosed early enough, however, such serious outcomes can be prevented by diet and lifestyle changes.”

The new MRI liver-disease application will help clinicians determine exactly where, how much, and what kinds of fat are present in patients’ livers. The ability to track these levels and compare them to health outcomes over time will reveal a lot about fatty liver disease and how to prevent serious illness.

Capital Health neurosurgeon Dr. David Clarke is working with BIOTIC’s Tynan Stevens on the new brain-mapping application. “We’re improving the accuracy of pre-surgical brain mapping, so surgeons can go in to remove a brain tumour without fear of disrupting vital brain functions, like the ability to speak, process language or control one’s limbs,” explains Stevens, a PhD student in medical physics at Dalhousie University.

### Opportunities abound

As BIOTIC finalizes a commercialization agreement

Capital Health radiologist Dr. Sharon Clarke examines MRI images of prostate cancer—her work with BIOTIC will lead to new tools for faster, more accurate MRI diagnosis of prostate cancer and fatty liver disease.



that will see the new MRI applications in use around the world, the opportunities for this dedicated group of researchers continue to expand.

“We’re already working with one of the world’s leading MEG (magnetoencephalography) companies, Elekta Neuromag, and have worked on projects with about 15 other firms over the past year,” notes BIOTIC’s manager of business development, Denise Lalanne. “We’ve already hired a computer scientist, two physicists and a research coordinator over the past few months, and

we’ll be hiring more staff in the near future, so things are really taking off.”

Nova Scotians will benefit from this research in many ways. In terms of better health, they will be the first to have access to leading-edge diagnostic technologies. In terms of a healthier economy, they will see more young people coming to and staying in the province to fill the growing demand for talented, creative, highly qualified research staff.



BIOTIC's business development manager, Denise Lalanne, tracks progress on more than a dozen commercial R&D partnerships.

#### *This research will:*

- *develop new tools for the rapid, accurate and objective interpretation of MRI-generated diagnostic images*
- *improve the diagnosis and monitoring of prostate cancer and fatty liver disease*
- *increase the safety and effectiveness of brain-tumour-removal surgery*
- *lead to new MRI applications for a host of other diseases*
- *generate royalties that will flow back to support and expand local research*
- *create new jobs and satisfying careers for talented young people*



# Orthopaedic Clinical Research and Validation

## New technologies transforming orthopaedic care

*Orthopaedic surgeons and their colleagues at Capital Health, Dalhousie and the IWK are on the international forefront of new technologies that aim to revolutionize joint-replacement surgery and the treatment of osteoarthritis. These technologies promise fewer implant failures, less-invasive and more-successful revision surgeries, and better mobility and quality of life for patients.*

What began more than a decade ago – as one project to investigate a new technique for monitoring the movement of joint-replacement implants after surgery – has snowballed into more than a dozen projects involving millions of dollars in funding and numerous orthopaedic surgeons, physiotherapy specialists, biomedical engineers, research coordinators, technicians, and industry partners.

“It all started with a 3-D imaging technique called RSA,” recalls Dr. Michael Dunbar, a Capital Health orthopaedic surgeon and Dalhousie professor who, with then-graduate student Chad Munro, pioneered the use of RSA (radiostereometric analysis) in North America to analyze the micro-motion of hip and knee joint replacement implants after surgery. “We showed that RSA accurately predicts when an implant will fail, so it can be removed and replaced with a more suitable design for that patient quickly, before too much damage is done to remaining bone tissues.”

This work attracted widespread interest among orthopaedic surgeons and implant manufacturers and began to inform improvements to implant design. Meanwhile, Mr. Munro launched Halifax Biomedical Inc., and a \$3.4 million award from the Atlantic Canada Opportu-

nities Agency Atlantic Innovation Fund (ACOA-AIF) funded the researchers to develop and commercialize RSA-monitoring kits. Now known as “the Halifax System,” these are used around the world to improve monitoring and outcomes of joint-replacement surgeries.

### It's in the way we walk

While it's critically important to identify failing implants early, Dr. Dunbar would prefer it if the implant never failed at all. Learning of the work of physiotherapy professor Dr. Cheryl Kozey to analyze the impact of gait on the development of hip and knee osteoarthritis (OA), he began collaborating with her and biomedical engineering professor Dr. Janie Astephen-Wilson. This research has revealed how certain patterns of walking not only lead to OA, but also hasten implant failure following surgery. Now the researchers are learning how targeted exercises may modify gait to slow OA progression and prolong the life of implants, and looking to a future when pre-operative gait analysis will help surgeons determine which implant and positioning are most suited to a patient's individual walking style.

### Minimally invasive implant fixes

In spite of advances in implant design and selection, the implants still sometimes fail. Yet every time a surgeon goes in to replace a failed implant, the patient loses more bone and stability. That's why Dr. Dunbar is collaborating with materials scientists in Dalhousie's Faculty of Dentistry – Dr. Daniel Boyd and Dr. Mark Filiaggi – who along with interventional radiologist Dr. Bob Abraham are working on an AIF project to develop cements that bond chemically with bone while stimulating the growth of new bone. “Instead of major surgery

#### 2002

Surgeon Michael Dunbar and biomedical engineering graduate student Chad Munro begin to study RSA as a means of monitoring stability of joint-replacement implants.

#### 2004

Munro launches Halifax Biomedical Inc. to develop and commercialize “RSA kits” for the international orthopaedic market.

#### 2006

Dunbar begins collaborating with colleagues in physiotherapy and biomedical engineering to learn how gait influences osteoarthritis risk and implant failure.

#### 2008

Through the Atlantic Innovation Fund, ACOA awards \$3.4 million to the RSA project with Halifax Biomedical Inc.



Judith Veinot of Port Williams, Nova Scotia, has known the pain and disability of seven knee-replacement surgeries over the past 15 years. Every new implant would begin to loosen within weeks, causing instability that sometimes led to bone-breaking falls. She got a new lease on life this spring, when Dr. Michael Dunbar secured her most recent implant with an injection of bone cement. "She's one of the first in Canada to have this done," notes Dr. Dunbar. "Instead of starting over again with a major operation, we did an outpatient procedure that stabilized her knee." According to Mrs. Veinot, "I can walk fine now, without falling, as long as I stay on level ground. This is the best result I've had in 15 years."

## 2011

Dunbar begins collaborating with Drs. Daniel Boyd, Mark Filiaggi and Bob Abraham on new-generation bone cements.

## 2013

AIF awards \$2.5 million to Mobility @ Capital Health to develop tools to improve access to appropriate orthopaedic care for patients with hip, knee and spine problems.

## 2014

The Capital Health researchers begin working with industry partners, Emovi Inc., Kinduct Technologies and OrthoMX, to develop new technologies that empower patients and streamline access to the most appropriate orthopaedic care.

## Orthopaedic Clinical Research and Validation (continued)

to start over with a new implant that may also fail, we're aiming for a simple outpatient procedure to stabilize the existing implant with a cement injection," explains Dr. Dunbar. "This will provide better results for some patients, while saving millions of health care dollars."

### Empowering patients and reducing wait times

The past decade's research laid the groundwork for Mobility @ Capital Health, a new \$2.6 million ACOA-AIF-funded project involving Capital Health clinicians – including orthopaedic surgeons, Dr. Bill Oxner and Dr. Glen Richardson, and physiotherapists led by Randi Munroe – as well as three industry partners, Kinduct Technologies, Emovi Inc. and OrthoMX Inc.

"We're developing a suite of new technologies to aid in the more efficient diagnosis and management of hip, knee and spine problems, while generating revenues that will flow back to the health care system," explains Dr. Dunbar. These technologies include customized online patient education and exercise programs, to help patients better manage their condition, as well as a mobile gait-assessment device that will enable surgeons to monitor arthritis patients from a distance. "These technologies aim to streamline the assessment process, free patients from the burden of travelling to see their surgeon, open up surgeons' schedules, and cut wait times for badly needed spine, hip and knee surgeries."

Dr. Michael Dunbar and Dr. Mark Filiaggi discuss how new bone-growth-stimulating cements being developed at Dalhousie can be used to secure joint-replacement implants that are starting to wiggle loose.



Photo by John Sherlock





Frank McKinnon (left) of Kinduct Technologies shows Dr. Michael Dunbar and Barbara Campbell (CEO of OrthoMX) how patients waiting for spine, knee or hip surgery can manage their condition using the customized online patient-education programs being developed through Mobility @ Capital Health.

*This research will:*

- *improve the design and custom selection of joint-replacement implants*
- *enable early identification of implant failure*
- *develop less-invasive, more-effective techniques for rescuing implants from failure*
- *streamline access to orthopaedic services*
- *delay the need for orthopaedic surgery and improve outcomes when surgery is required*
- *provide tools to reduce pain and improve function in people who do not require surgery*
- *reduce travel, time away from work, and expense for patients, while reducing wait times for badly needed surgeries*
- *bring world-class technology and innovation to Halifax*

# Community Cardiovascular Hearts in Motion

## Reducing risk and saving lives

*Since its inception as a research project in 2006, Community Cardiovascular Hearts in Motion has helped more than 2,000 at-risk patients reduce their risk of illness, hospitalization, disability and death from cardiovascular disease. Now a permanent program, Hearts in Motion is developing new ways to involve even more people in its proven approach to prevention.*

In 2006, Dr. Nicholas Giacomantonio came up with what was then a radical idea – to run cardiac rehabilitation programs in the community, and to open those programs up to include not only those with established cardiovascular disease, but also to those at high risk of developing of it.

“People used to be introduced to the system by an event, like a heart attack. After some sort of intervention, like a stent or a bypass, they’d be referred to a cardiac rehab program at the hospital, to hopefully prevent another event,” explains Dr. Giacomantonio, a Capital Health cardiologist and professor of medicine at Dalhousie. “The problem is, dropout rates from hospital programs are really high, because there are so many barriers. For many, it’s too far to drive, or the parking is too expensive. We knew we needed to remove those barriers.”

The QEII Foundation provided the initial \$1.5 million that enabled Dr. Giacomantonio and research and program manager Wanda Firth to launch Nova Scotia’s first community-based cardiac rehab program, at accessible locations in Sackville, Dartmouth and Spryfield. They called the program Community Cardiovascular Hearts

in Motion and began taking referrals from family physicians and other health professionals.

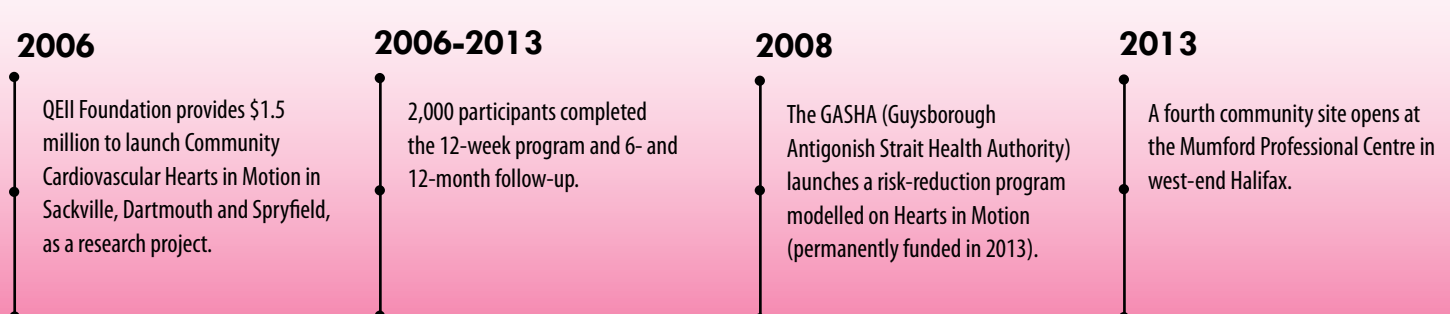
### Enthusiastic response, impressive results

“Response in the communities was fantastic right from the beginning,” says Ms. Firth. “We ran 2,000 patients through the program from 2006 to 2013, receiving very positive feedback from participants and health professionals and achieving major improvements to participants’ risk-factor profiles.”

Hearts in Motion is a 12-week program that connects people with or at-risk of cardiovascular disease with a team of health professionals who provide them with education, monitoring and support to cut their risk. From supervised exercise sessions to dietary, medication and behaviour-management interventions, the Hearts in Motion team works with participants to set and achieve their risk-reduction goals, and follows up 6 and 12 months later to ensure they’re still on track.

Results have been impressive. At the one-year follow-up of participants with heart disease:

- more than 80 per cent stuck with the program, compared to typical adherence rates of less than 35 per cent for hospital-based cardiac rehab
- 81 per cent reached their blood-pressure targets
- 68 per cent reached their LDL cholesterol targets
- 60 per cent reached their blood-glucose targets
- 47 per cent reached their body-mass index targets





Hearts in Motion physiotherapist Sarah Clow, Dr. Nicholas Giacomantonio, and other members of the Hearts in Motion Team, not shown here, supervise participants in weekly exercise sessions designed to build confidence and energy, along with aerobic capacity. The participants all report feeling more energetic, positive and motivated to stay active. (Back, left to right): Peter Eggenjuizen, Dr. Nick Giacomantonio, Ron Mills, Celia Yazer, Sarah Clow; (front): Sharon Cook.

## 2013

Hearts in Motion presents results to Capital Health management, receives funding to make it a permanent program.

## 2014

Accreditation Canada awards the program its Innovative Leading Practice Award.

## 2014

Hearts in Motion joins forces with three other provinces and a N.S. tech firm to develop ACCELERATION, a virtual platform for health behaviour change that will be widely available.



## Community Cardiovascular Hearts in Motion (continued)

### Becoming a permanent program

The initial research phase of Hearts in Motion showed not only across-the-board reductions in participants' risk factors, it also showed a 33 per cent relative reduction in risk of death for people with established heart disease.

“With such positive results, we knew we had to try to make this a permanent program,” says Dr. Giacomantonio. “The cost of cardiovascular disease in Nova Scotia is so high, in terms of human suffering and loss of life, and in terms of health care resources.”

As Dr. Giacomantonio points out, it costs the system \$1,175 for a person with heart disease to complete the Hearts in Motion program. By comparison, a single-vessel angioplasty runs \$8,000; a double-bypass operation doubles that cost at least.

“When we presented our results to Capital Health management in 2013, they immediately recognized the powerful potential to save lives while saving a tremendous burden on taxpayers and the health care system,” he says. “Our approach was also in line with their vision to care for citizens in their communities... they decided to

make Hearts in Motion a permanently funded program and model of care. Our goal now is to see it rolled out in communities all across the province.”

### Accelerating risk reduction

In an effort to help even more people reduce their risk of chronic disease – including cardiovascular disease and cancer – the Hearts in Motion team has joined forces with researchers in Ontario, Quebec and British Columbia. They're working with a Nova Scotia health-tech firm, Kinduct Technologies, to develop and test a digital platform to help people with four key risk behaviours: smoking, inactivity, poor-quality diet, and alcohol consumption. The Canadian Partnership Against Cancer, Heart and Stroke Foundation of Canada and Health Canada are funding the project, called ACCELERATION.

“The idea is to take motivational communication and behaviour-change methods we've proven through Hearts in Motion and put them in a virtual format so large numbers of people benefit,” says Dr. Giacomantonio. “We need to accelerate risk reduction now, to avoid a health catastrophe in the future.”

Capital Health employees take part in a new Hearts in Motion-based program that's helping them cut their risk of chronic disease by learning to prepare healthy, delicious meals. On the right, ACCELERATION dietitians, Maureen Tilley and Mark Rogers.





Registered nurse Peggy Hulan monitors participants' blood pressure while they exercise, to ensure and reassure that the activity level is safe. She is pleased with Sharon Cook's blood pressure reading.



Dr. Nick Giacomantonio and Wanda Firth

*This research is:*

- *dramatically reducing the full range of risk factors, and risk of death, for people with cardiovascular disease*
- *improving the risk-factor profile and physical fitness of people who were at risk of cardiovascular disease when they started the program (many are no longer at risk)*
- *preventing the need for hundreds of costly, invasive procedures in hospital*
- *helping set Nova Scotia on the right track for a healthier future*

# New Researcher Profile: Dr. Lisa Barrett

## Connecting the dots between hepatitis C and the aging immune system

In studying how new-generation antivirals help the immune system bounce back from hepatitis C infection, infectious diseases specialist Dr. Lisa Barrett is shedding light on how the immune system could be boosted to regain vitality into old age.

Since arriving in Halifax in January 2014, clinician scientist Dr. Lisa Barrett has been busy seeing patients in Capital Health's HIV and hepatitis C outpatient clinics, consulting on the infectious diseases inpatient service, setting up her new research lab in the Sir Charles Tupper Medical Building at Dalhousie, and analyzing blood and liver samples from patients with hepatitis C.

"It's every clinician researcher's wish, to have that fit between their clinical duties and their research focus," says Dr. Barrett, who studies how the immune system responds to hepatitis C and new treatments for the infection. "This, the opportunity to have the great majority of my time protected for research, and to work with amazing colleagues, is what brought me back to Halifax – it's a rare opportunity in Canada."

Originally from Newfoundland and a graduate of Memorial University, Dr. Barrett completed her residency training in internal medicine at Dalhousie Medical School, followed by sub-specialty training in infectious diseases at the University of Toronto. After that, she headed to the National Institutes of Health in Maryland, U.S.A., to complete a scientific and clinical fellowship in the area of hepatitis C. Now, she brings her expertise back to the Maritimes, where she's laying the groundwork for clinical trials of brand new, highly effective oral antiviral treatments for hepatitis C she helped test in early-stage trials in Maryland.

### You're only as old as your immune system

Hepatitis C virus is mysterious in that it doesn't stimulate a robust-enough immune response to kill the virus or build up protective immunity. "You can kill hepatitis C virus with antivirals and make it go away, but the person can always be re-infected, like the flu," she says. "Except, unlike influenza, there is no vaccine against the hepatitis C virus."

By studying how the immune system responds to hepatitis C treatment, her lab work may yield insights into a vaccine strategy against the disease, which can lead to irreversible liver disease and liver cancer. At the same time, she is uncovering clues to protecting the immune system from the ravages of aging.

"When you have hepatitis C, your immune system looks old," Dr. Barrett explains. "You could be 40, with the immune system of an 80 year old."

Remarkably, treatment with new-generation antivirals seems to reverse this "aging" process, revitalizing flagging immune cells and allowing immune cells to flourish after the virus is vanquished.

"We're looking at individual cells from hepatitis C patients to see if, how and when they regain this vitality after treatment," she says. "If we can find the mechanism, we may have the key to boosting any person's aging immune system, whether it's exhausted from fighting infection or simply from advancing age."

Keeping the immune system young in the face of advancing age would be a major advance in preventive health care. "Older people with worn immune systems are more vulnerable to all sorts of infections and don't develop very efficient immunity in response to vaccines," notes Dr. Barrett. "I'm hopeful my work will help people age well with fewer infections."





Infectious diseases clinician scientist Dr. Lisa Barrett and research scientist Dr. Sharon Oldford study immune cells isolated from patients with hepatitis C. They're seeking clues to a vaccine for the virus, while learning how the immune system recovers from the "aging" effects of the infection. They hope the work will lead to ways of revitalizing older people's worn-out immune systems.

## Improving quality of life for transplant patients with an Endowed Chair in Transplantation Research

Atlantic Canadians will soon benefit from advancements in organ transplantation. In October 2013, Dr. Ian Alwayn was announced as the inaugural QEII Foundation Endowed Chair in Transplantation Research.

Dr. Alwayn is the surgical lead for the Multi-Organ Transplant Program at the QEII Health Sciences Centre and an associate professor at Dalhousie Medical School. His research focuses on optimizing the health of donors and recipients, while improving the quality of organs prior to transplantation.

“Organ transplants not only save lives but also offer a significant improvement in the quality of life for the recipients,” says Dr. Alwayn. “I think it also gives donors’ families, who have been through something very tragic, the opportunity to make sense of that tragedy, having their loved one’s organs live on in another individual.”

Endowed research chairs provide stable long-term funding for the research chair holder, allowing further medical advancements to be made in a dedicated area. This research will enhance care for future Atlantic Canadian patients receiving organ transplants at the QEII; patients like Ellie O’Brien, who was diagnosed with end-stage renal failure at just 16 years old. She received her new kidney after 14 months on the transplant list and 20 hours a week, every week, spent on dialysis.

“Because of research, I am here today,” says Ellie. “It is my hope that transplantation research at the QEII will continue to save and improve the lives of patients and their families.”

The Multi-Organ Transplant Program at the QEII has performed approximately 3,500 organ transplants for Atlantic Canadians since 1969. The QEII is the only health centre in Atlantic Canada able to do transplants.



Photo and story courtesy QEII Foundation

Dr. Ian Alwayn with Ellie O’Brien, who received a life-saving kidney transplant after being diagnosed with renal failure at the age of 16.

The QEII Foundation partnered with RBC, Roche Canada and other generous donors to make the Endowed Chair in Transplantation Research a reality. Research chairs help transform scientific thinking and have a direct impact on patient care locally and around the world.

“I work with a team that is very dedicated to making transplants possible: our focus is always on improving the health of patients,” says Dr. Alwayn. “As the Chair, my goal is to bring researchers together, collaborate with different programs and enhance the transplant experience for patients.”

As for Ellie, it has been five years since her kidney transplant. She is a healthy and happy university student in her last year of nursing. Grateful for transplantation research, Ellie sums her experience up in a few words: “It saved my life.”

# Research Education Program Meets the Need

*The Research Services education program aims to provide responsive, accessible training that researchers can relate to and benefit from.*

## Easy access

Research teams are busy. Their first commitment is to research participants. Research team leaders often have a heavy patient load and teaching commitments at Dalhousie University. The research education program manager is happy to make training accessible by taking it to the researcher. This may involve outside-of-normal-work-hours sessions, presentations at departmental staff meetings or telehealth sessions to external sites.

## Responsive training

An example of responding to need occurred when the Personal Health Information Act (PHIA) came into force on June 1, 2013. The act governs the collection, use, disclosure, retention, disposal and destruction of personal health information. PHIA introduced new requirements for health care research in Nova Scotia, leading to modifications to procedures, practices and forms. Ten PHIA information sessions provided the training to put research teams in the picture.

## Rising to new challenges

Investigator-initiated research is on the rise. With it comes the need for the investigator to comply with regulations and guidelines, especially the monitoring for quality data and patient safety. A new venture this year was a monitoring workshop designed to educate research staff who may be interested in the provision of monitoring services for investigator-initiated research.

For several years, Health Canada has required research team members to be trained on ICH-GCP (International Conference on Harmonization – Good Clinical Practice). There is now an additional expectation that individuals who are working on clinical drug trials be trained on applicable regulations (Division 5). Several sessions were held, sometimes for specific departmental research teams.

## Standardizing training—an additional benefit

Using teleconferencing technology, Research Education Across Atlantic Canada Hospitals (REACH) offers topics of interest to research communities at Fredericton's George Dumont Hospital, Moncton General Hospital, Saint John Regional Hospital and the Cape Breton Regional Hospital.

Neighbouring jurisdictions enjoy the benefit of REACH sessions and also send their research team members to workshops in Halifax. This standardized training strengthens the research community throughout the Atlantic region.

## Training numbers

### June 2013 to June 2014

#### PHIA:

- sessions: 10

- participants: 248

#### REACH:

- sessions: 4

- participants: 238

#### Total participants:

764

#### Participants from outside Capital

Health: 10%

### 2005-2014

#### *Diving into Clinical Trials*

##### *Two-day Workshops:*

- days of training 62

- participants 415



## Capital Health Research Fund Awards Fall 2013

Sixteen successful CHRF applicants received awards totalling \$193,473.

Name	Department	Award	Research Description
Sarah Appleton	Department of Surgery / Plastic & Reconstructive Surgery	\$5,000	Review of current melanoma diagnosis, staging and treatment protocols in the province of Nova Scotia
Michael Butler	Department of Emergency Medicine	\$4,800	The use of machine-learning algorithms to aid in diagnosis of adult emergency department patients
Sanem Cimen	Department of Surgery	\$4,911	Effect of oral everolimus treatment on intra-abdominal adhesions
Ashley Cox	Department of Urology	\$15,000	The use of anticholinergic agents following treatment of localized prostate cancer
Jill Cumby	Department of Psychiatry	\$14,963	Needs of parents with severe mental illness and their offspring
Scott Grandy	Department of Medicine/ Cardiology	\$14,984	Age-related alterations in cardiac electrical activity: the role of inflammation
Todd Hatchette	Department of Pathology & Laboratory Medicine / Microbiology	\$15,000	Evaluating TLR agonists in a liposome carrier as novel influenza vaccines
Ali Imran	Department of Medicine/ Endocrinology	\$12,930	A pilot study to assess the role of dopamine agonist therapy in PCOS
Jonathan Lai	Department of Pathology & Laboratory Medicine/ Anatomical Pathology	\$5,000	Examining the role of apoptotic pathways in merkel cell carcinoma
Andrea Lantz	Department of Urology	\$11,940	External validation of a clinical nomogram to predict successful single treatment shockwave lithotripsy of renal and ureteral stone
Emily Marshall	Dalhousie Family Medicine/ Primary Care Research Unit	\$15,000	Medication appropriateness and polypharmacy in long-term care
Jessica Morash	Department of Psychiatry	\$14,926	Sleep in children and youth at familial risk for severe mental illness
Kim Parker	Department of Assistive Technology/ Rehabilitation & Supportive Care	\$14,645	Predicting prosthetic use in people with lower limb amputations: evaluation of the amputee mobility predictor (AMP) as a tool to guide prosthetic prescription
Gwynedd Pickett	Department of Surgery/ Neurosurgery	\$15,000	CT-perfusion imaging to predict vasospasm in subarachnoid hemorrhage
Derek Rutherford	Department of Surgery/ Orthopaedics	\$14,779	Assessment of walking mechanics and muscle-activation patterns in individuals with hip osteo-arthritis—a pilot study
Karthik Tennankore	Department of Medicine/ Nephrology	\$14,542	Towards a better understanding of frailty in dialysis

## Capital Health Research Fund Awards Spring 2014

Sixteen successful CHRF applicants received awards totalling \$211,067.

Name	Department	Award	Research Description
Mohamed Abdollel	Diagnostic Imaging	\$15,000	Toward personalized breast cancer risk assessment: revisiting the contribution of breast density in the era of full-field digital mammography
Lisa Barrett	Medicine/Infectious Disease	\$50,000	Understanding poor vaccine responses: immune exhaustion in HIV infection
Shaun Boe	Medicine/Physical Medicine & Rehabilitation	\$15,000	Motor imagery with neurofeedback: establishing feasibility in patients post stroke
Chris Blanchard	Medicine/Cardiology	\$14,580	Cardiac rehabilitation sedentary behaviour correlates (CARES)
Michael Dunbar	Surgery, Orthopaedic Surgery	\$14,608	A ten-year evaluation of implant fixation in four total knee replacement designs using radiostereometric analysis
Gail Eskes	Psychiatry	\$14,912	The behavioural and neural mechanisms in prism adaptation treatment for spatial neglect
Yugi Gu	Anesthesia, Pain Management & Perioperative Medicine	\$5,000	The effect of simulator fidelity on acquiring non-technical skills: randomized controlled trial
Richard Hall	Anesthesia, Pain Management & Perioperative Medicine	\$15,000	Proton pump inhibitors for stress ulcer prophylaxis in critically ill patients: pilot randomized trial
Arnold Mitnitski	Medicine/Geriatric Medicine	\$15,000	The basis of frailty: complex network modelling
Brigit Pierce	Nursing	\$2,193	Waiting for a liver transplant: an exploration of experience of patients and their caregivers in Atlantic Canada
Olga Theou	Medicine/Geriatric Medicine	\$4,944	Sedentary behaviors in hospitalized older patients: how much time they are sedentary and how it affects their health
Andrew Travers	Emergency Medicine/EMS	\$14,830	Outcomes of a provincial cardiac reperfusion strategy: a population-based, retrospective cohort study
Rudolf Uher	Psychiatry/Addictions and Mental Health	\$15,000	Effect of cognitive-behavioural intervention on the trajectories of brain development in adolescents at risk for severe mental illness
Andrew Williams	Pathology & Laboratory Medicine /Anatomical Pathology	\$5,000	Expression of germ cell tumour markers OCT4, SALL4, NANOG, and SOX2 in testicular and extra testicular diffuse large B cell lymphoma
David Wilson	Surgery/Orthopaedic Surgery	\$5,000	Validation of a statistical shape modelling algorithm for use on navigated total knee arthroplasty point cloud data
Paul Yaffe	Anesthesia/Critical Care	\$5,000	Chronic narcotic use after ICU discharge: the ICUPMP dataset

## QEII Foundation Translating Research Into Care (TRIC) Grants

The QEII Foundation Translating Research into Care (TRIC) health care improvement research program was established in 2013 to fund research that aims to translate clinical science into improved delivery of services and patient care at the QEII Health Sciences Centre. The program offers three levels of funding support for research that will immediately benefit patient care. All TRIC grants are co-led by a research scientist and a health centre administrator. The research costs associated with the grant are covered by the TRIC funding award. Operational costs associated with the grant come from within current health centre budgets to ensure that the change is sustainable. Funding support for TRIC grants at the QEII Health Sciences Centre is provided by the QEII Foundation.

### Fall 2013 Award Recipients

**Dr. Christine Short**, Division Head, Physical Medicine & Rehabilitation, Capital Health

**Mary-Ellen Gurnham**, Executive Director of Learning & Chief Nursing Officer, Capital Health

— Collaboration between care providers has many proven benefits including: improving patient safety and decreasing the length of stay. This project will develop an evaluation framework to determine success of interprofessional collaborative practice within Rehabilitation Services and Supportive Care.

**Dr. Fred Burge**, Professor and Research Director, Dalhousie Family Medicine

**Lynn Edwards**, Director, Primary Health Care, Capital Health

— The impact of a web-based “frailty portal” in family practice for patients, caregivers and providers: identification, screening and appropriate care planning. The goal is to reduce preventable emergency department visits and hospitalizations.

**Alexander J. Clark**, Medical Director, Pain Services, Capital Health; Professor, Department of Anesthesia, Pain Management & Perioperative Medicine, Dalhousie University

**Karen Mumford**, Director Peri-Operative Services, Ophthalmology, Critical Care & Tissue Bank, Capital Health

— Patients who use high doses of opioids for pain management pose challenges for health care providers in the perioperative period. The goal is to determine how to provide better post-surgical pain care for those patients who already use high doses of opioids for pain management.

**Michael Vallis**, Psychologist and Lead, Behaviour Change Institute, Primary Health Care, Capital Health; Associate Professor, Family Medicine and Psychiatry; Adjunct Professor, Psychology and Health and Human Performance, Dalhousie University

**Tara Sampalli**, Manager, Behaviour Change Institute; Assistant Director, Research, Quality and Knowledge Management, Primary Health Care, Capital Health; Assistant Professor, Medical Informatics, Dalhousie Medical School

— Health care is designed to react to disease rather than to prevent it. The goal of this project is to evaluate the integration of health behaviour change interventions into primary care settings.

**Tara Sampalli**, Manager, Behaviour Change Institute; Assistant Director, Research, Quality and Knowledge Management, Primary Health Care, Capital Health; Assistant Professor, Medical Informatics, Dalhousie Medical School

**Lynn Edwards**, Director, Primary Health Care, Capital Health

— Improving chronic care delivery and functional health outcomes for individuals with multimorbidities in Primary Health Care.

**Graeme M. Rocker**, Head, Division of Respiriology, Capital Health; Professor, Department of Medicine, Dalhousie Medical School

**Paula Bond**, VP, Acute Care, Person Centered Health, Capital Health

— Expanding the INSPIRED COPD outreach program to the Emergency Department: assessing feasibility, efficiencies and outcomes.



**Karthik Tennankore**, Division of Nephrology, Department of Medicine, Capital Health  
**Cynthia Stockman**, Health Services Manager, Outpatient Nephrology, Capital Health  
— The effectiveness of an online portal for the delivery of care to home dialysis patients.

## Spring 2013 Award Recipients

**Jill Hayden**, Affiliated Scientist, Capital Health; Assistant Professor, Department of Community Health & Epidemiology, Dalhousie Medical School

**Kirk Magee**, Emergency Physician and Trauma Team Leader, Capital Health; Associate Professor, Emergency Medicine, Dalhousie Medical School

**Samuel Campbell**, Chief, Department of Emergency Medicine, Medical Director of Triage, Interfacility Transport and In-House Paramedics, Capital Health; Professor, Emergency Medicine, Dalhousie Medical School  
— Management of low back pain in the Capital Health Department of Emergency Department.

**Stacy Ackroyd-Stolarz**, Patient Safety Scientist, Capital Health; Assistant Professor, Department of Emergency Medicine, Dalhousie Medical School

**Sandra E. Janes**, Health Services Director, Emergency and Customer Service, Capital Health  
— Care and Respect of Elders in Emergencies (CARE) Program.

**Robin Urquhart**, Affiliated Scientist, Capital Health; Assistant Professor, Department of Surgery, Dalhousie Medical School

**Vickie Sullivan**, Director VG Site: Cancer Care, Transplant and Acute Inpatient Services, Capital Health  
— Developing an informed approach to transitioning cancer survivors from the Cancer Centre to primary care.

**Jean-François Légaré**, Director of Research, Cardiac Surgery, Capital Health; Associate Professor of Surgery, Cardiac Surgery; Associate Professor, Department of Microbiology and Immunology & Department of Pathology, Dalhousie Medical School

**Sue Brander-Murtha**, Health Services Manager 5.1 CVICU, Capital Health

**Vicki Wiseman**, Health Services Manager, 7.1 Cardiovascular Surgery Inpatient Unit, Capital Health  
— Towards impacting infection rates in hospitalized patients undergoing cardiac surgery.

**Marilyn MacKay-Lyons**, Affiliated Scientist, Capital Health; Associate Professor, School of Physiotherapy, Dalhousie University

**Richard Braha**, Manager of Acquired Brain Injury Services, Nova Scotia Rehabilitation Centre, Capital Health  
— Stepping up aerobic exercise at the Nova Scotia Rehabilitation Centre to improve health outcomes after stroke: a clinical feasibility project.

**Greg Hirsch**, Head, Division of Cardiac Surgery, Capital Health; Professor of Surgery, Dalhousie Medical School

**Janet Curran**, Clinical Scientist, IWK Health Centre; Assistant Professor, School of Nursing, Dalhousie University

**Debbie Hutchings-Mulcahey**, Director, Heart Health Program/Ambulatory Care, Capital Health

**Jim MacLean**, Capital Health Finance and e-Information, Manager PMO & Standards, Capital Health

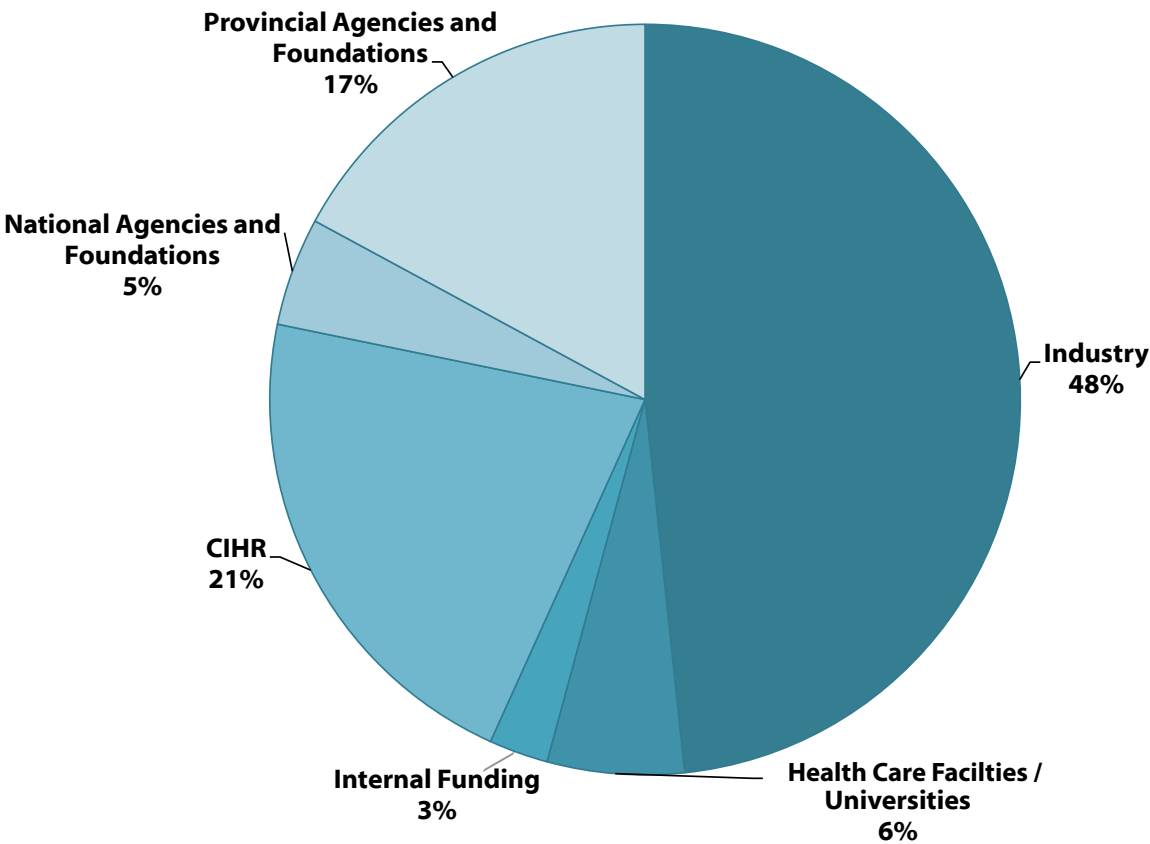
**Karen Mumford**, Director Perioperative Acute Care, Capital Health

— Implementation of a sustainable, formalized shared decision-making process among frail, elderly patients referred for cardiac surgery.

# Awards for Research Conducted at Capital Health for 2013 – 2014 Fiscal Year

	Administered at Capital Health	Administered at Dalhousie University
Research Grants	\$12,838,735.99	\$ 4,529,219.84
Research Contracts	\$ 8,683,772.31	\$ 2,333,096.77
Total	<b>\$21,522,508.31</b>	<b>\$ 6,862,316.61</b>
Total: \$28,384,824.91		

Source of Research Awards for 2013-2014  
for Research Conducted at Capital Health



# Capital Health Research: All Research Accounts

## Statement of Revenue and Expenses

(April 1, 2013, to March 31, 2014)

**Opening Balance April 1, 2013** **\$26,666,734**

### Revenue

Grants*	12,962,653
Contracts*	6,698,692
Interest and Realized Gain on Investments	2,191,076
Other Revenue	647,968
Federal Indirect Costs Program	645,557
Ethics Review Fee	248,000
RMU Consulting Fee	119,100
Record Retention Fee	40,031
<b>Gross Revenue</b>	<b>\$23,553,078</b>

### Expenses

<b>Compensation</b>	<b>\$12,012,090</b>
<b>Supplies and Services Expenses</b>	
Transfers Offsite	1,620,494
Purchased Services/Professional Fees	1,120,777
Other Expenses	782,693
Equipment	636,167
Overhead to Dalhousie	562,690
Travel/Professional Development	484,308
Clinical Laboratory Services	395,284
Diagnostic Imaging Services	355,779
Printing/Office and Computer Supplies	306,027
Travel-Research Participant	302,641
Pharmacy Services and Drugs	285,316
Maintenance	133,336
Medical/Surgical Supplies	76,967
Communications	39,232
Recoveries of Expenses	(405,310)
	<b>6,696,401</b>
<b>Total Expenses</b>	<b>\$18,708,491</b>

**Net Inflow/Outflow** **4,844,586**

**Unrealized Gain (Loss) on Investments** **(223,754)**

**Ending Balance March 31, 2014** **\$31,287,567**

### Overhead Distribution 13/14

Capital Health Research Services	1,081,616
Capital Health Research Development	170,491
University Departments	337,345
Faculty of Medicine, Dalhousie University	225,344
<b>Total Overhead</b>	<b>\$1,814,797</b>

\* Includes overhead



# Research Staff, Ethics Board and Research Fund Committee

Patrick McGrath, OC, PhD, FRSC, FCAHS

Integrated Vice President, Research & Innovation, Capital Health & IWK Health Centre

Tina Munroe, Executive Assistant

## Research Services

Lisa Underwood, Director

Michelle Roden, Administrative Assistant

Alicia Benton, Coordinator, Contract Facilitation & Support

Janet Gallant, Program Manager, Research Education

Mary Kate Needler, Program Manager, Research Quality

Jayne Norrie, Coordinator, Institutional Awards

Stacey Pyke, Administrative Coordinator, Contracts & Grants

Judith Thompson, Human Resources Manager

Jennifer Thurlow, Coordinator, Grant Facilitation & Support

Emily Walker, Communications Coordinator

## Research Financial Services

Denise Hatchette, Manager, Research Funds & Infrastructure

Jane MacLeod, Financial Analyst, Research

Hawley Murphy, Finance Officer, Research

## Research Development & Planning

Sandra Crowell, Program Leader, Research Development

Elaine Strohm, Administrative Assistant

## Research Ethics Board

Dr. Richard Hall, Chair

Larry Broadfield, Co-Chair

Dr. Harry Henteleff, Co-Chair

Dr. Andrew Jarvie, Co-Chair

Dr. David MacDonald, Co-Chair

Dr. Chris MacKnight, Co-Chair

Dr. Shelly McNeil, Co-Chair

Gredi Patrick, Co-Chair

Ken Jenkins, Manager

Nadine Gillam, Administrative Coordinator

Starla Burns, Ethics Coordinator

Amanda Hennebery, Ethics Coordinator

Joan Morrison, Ethics Coordinator

Pamela Trenholm, Ethics Coordinator

In addition to the Research Ethics Board executive and office staff, the board has 72 volunteer members. These members are drawn from the community, the legal profession, medical staff and hospital employees.

## Research Fund Committee

Dr. Kim Good, Co-Chair

Dr. Gordon Gubitz, Co-Chair

Dr. Stacy Ackroyd

Dr. Steven Beyea

Dr. Sharon Clarke

Dr. Jeremy Brown

Dr. Heather Butler

Dr. Sean Christie

Dr. Kelly Dakin-Hache

Dr. Arik Drucker

Dr. Gail Eskes

Dr. Ron George

Dr. Chris Gray

Dr. Wenda Greer

Dr. Tomas Hajek

Dr. Ed Hanada

Dr. Todd Hatchette

Olga Kits

Dr. Jason LeBlanc

Dr. Emily Marshall

Dr. Paige Moorhouse

Dr. Jennifer Payne

Dr. Matthias Schmidt

Amanda Tinning

Capital Health Research Annual Report 2013-2014

Produced by Capital Health Research Services

Content – Melanie Jollymore

Design – Emily Walker

Photography – Keith Jollymore

Emily Walker

Capital Health Research Services

117-5790 University Avenue

Halifax, NS B3H 1V7

902-473-7906

<http://www.cdha.nshealth.ca/discovery-innovation>

