



the power of

# partnerships

growing a vibrant  
health research community



# the power of partnerships



## We're growing a vibrant health research community

By merging their ideas, expertise and resources, researchers in Dalhousie University's faculties of Medicine, Dentistry and Health Professions, the IWK Health Centre and Capital Health have formed powerful partnerships with potential to transform our region's health and economy. Our research teams have the tools and intelligence to confront our most pressing health challenges, and the ambition and drive to grow our emerging knowledge-based economic sector.

By working together, our institutions and partners in the community have leveraged modest local investments into multi-million dollar research facilities and initiatives. In fact, we've brought more than \$630 million into the Maritime economy since 2002, and recruited a host of talented scientists and clinicians to launch new research programs and lead the way to better patient care.

As we grow, our impact on the health and economy of the region grows. Read on to learn how.

### THE IMPACT OF OUR PARTNERSHIP

- We're revving the region's economic engines through research spending, job creation and commercialization.
- We're keeping people moving in the face of chronic disease, improving life expectancy and quality of life and saving health care dollars.
- We're helping the people who need it most, from Aboriginal communities to frail elderly to homeless youth.
- We're leading the way to better care and patient outcomes.
- We're creating a healthier tomorrow through prevention research.



**Left to right:** Dr. Ray LeBlanc, VP of Research and Innovation, Capital Health; Dr. Mark Filiaggi, Associate Dean of Research, Faculty of Dentistry; Dr. Patrick McGrath, VP of Research, IWK Health Centre; Dr. Anita Unruh, Acting Associate Dean, Research & Academic, Faculty of Health Professions; Dr. Gerry Johnston, Associate Dean of Research, Faculty of Medicine

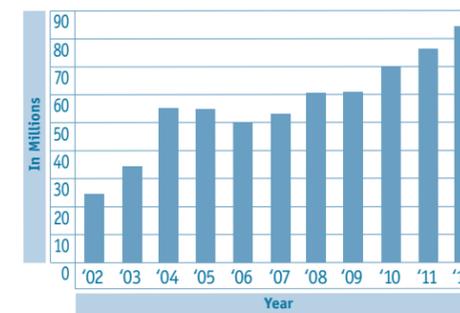
## Partnership fosters discovery and innovation for health

For the past few years, senior leaders in Dalhousie University's faculties of Medicine, Dentistry and Health Professions, the IWK Health Centre and Capital Health have been tearing down the boundaries between their institutions to make way for a more cohesive, creative and productive health research effort.

*"So many of our goals and challenges overlap... we all want to improve health, recruit the brightest talent and conduct top-notch research,"* says **Dr. Gerry Johnston**, Associate Dean of Research in the Faculty of Medicine. *"At the same time, we're all dealing with limited resources in terms of funding, people and space."*

As the leaders developed a clear picture of the scope of the community's research, they began to see the magnitude of its potential. *"By seeing ourselves as a single community with a shared vision, rather than separate entities pursuing our own aims, we've developed a stronger sense of how critically important this research is to the health and economy of the region,"* notes **Dr. Ray LeBlanc**, Capital Health's VP of Research and Innovation. *"Now we're aligning our priorities and efforts to achieve the greatest impact."*

### Growth of partners' collective research funding since 2002



Annual research funding has more than tripled since 2002, from \$24 million to \$85 million.

Facilitating broad-based collaborations, developing shared facilities, pooling resources to recruit top investigators, and launching joint training programs are just some of the ways the partners are cooperating to foster game-changing discovery and innovation. Joining forces like this broadens the community's horizons.

*"Bringing all the health faculties and the women's, children's and adult care institutions together promotes a broad definition of health that encompasses all life's stages and all aspects of health,"* explains **Dr. Patrick McGrath**, VP of Research at the IWK Health Centre. *"This leads to more integrated research programs that recognize, for example, the impact of mental health, or oral health, on overall health."*

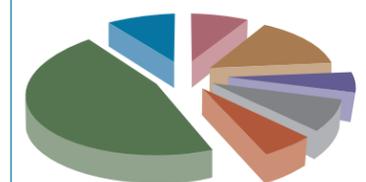
Interdisciplinary teamwork is being strengthened as a result of the partnership. *"More and more projects involve multiple professions,"* notes **Dr. Anita Unruh**, Acting Associate Dean (Research & Academic) in the Faculty of Health Professions. *"Combining the knowledge and perspectives of people in many different fields leads to cross-pollination of ideas and creative solutions to complex problems."*

The collaborative environment also makes this community a powerful magnet for talent, according to **Dr. Mark Filiaggi**, Associate Dean of Research in the Faculty of Dentistry. *"Researchers are coming here because they see the strong connections among scientists, clinicians and biomedical engineers, and the support for collaborative research in the community,"* he says. *"They see the opportunity to transform discoveries into innovations that will have a real impact on the health of people and the economy."*

### THIS RESEARCH IS...

- bringing millions of dollars into Nova Scotia's economy each year
- recruiting talented investigators to build vibrant research programs, train the next generation of researchers and improve patient care
- developing shared research facilities and support systems
- promoting interdisciplinary collaboration and point-of-care research
- fostering high productivity and rapid innovation

### 2011-12 health research funding, \$85 million

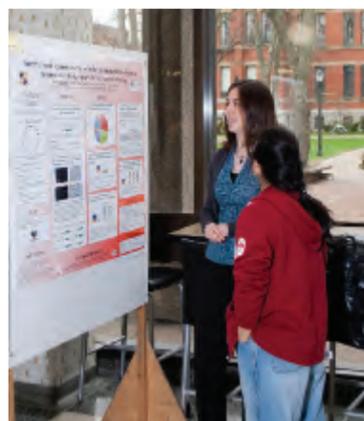


- Government of Canada & national granting councils
- Government of Nova Scotia
- Canadian associations, societies & foundations
- Canadian business and industry
- Canadian health care facilities
- Canadian universities, research institutes, centres & networks
- All international sources



The Integrated Health Research Training Program hosts frequent learning sessions for researchers in Nova Scotia and New Brunswick.

## Training partnership builds skills for research success



**TOP:** The Integrated Health Research Training Partnership hosts frequent learning sessions for researchers in Nova Scotia and New Brunswick.

The Maritimes is home to a unique health research training partnership that gives researchers a leg up in an increasingly competitive field. More than 700 participants have honed their research skills through the Integrated Health Research Training Partnership (IHRTTP) since its launch in 2006. These include graduate students, residents, postdoctoral fellows, faculty members at all levels, and new and veteran health professionals who want to bring research into their practice.

Dalhousie's faculties of Medicine, Health Professions, Dentistry and Graduate Studies joined forces with Capital Health and the IWK Health Centre to develop the IHRTTP, to ensure a high level of knowledge and skill across the health research community as a whole.

*"The IHRTTP's strength is the central coordination of education opportunities across Dalhousie, Capital Health and the IWK,"* notes **Camille Angus**, an epidemiologist who coordinates the community's shared Research Methods Unit. *"The breadth of topics enables a broad spec-*

*trum of researchers to take advantage of training most relevant to them."*

### The IHRTTP helps participants

- write successful grant proposals
- give dynamic presentations
- design research studies that meet ethical, legal and scientific standards
- effectively manage budgets and staff
- secure intellectual property rights
- network with researchers in other fields
- connect with mentors and resources in the community—and more.

Although most training sessions are based in Halifax, video-conferencing technology funded by the Government of New Brunswick—through its commitment to Dalhousie Medicine New Brunswick—allows participants across the Maritimes to join in.

The Nova Scotia Health Research Foundation and Dalhousie Medical Research Foundation are key supporters of the IHRTTP.

## Partnerships expand research capacity in the region

The health research partnership extends beyond Capital Health, the IWK and Dalhousie's faculties of Medicine, Dentistry and Health Professions. Many others play key roles in ambitious new ventures. See the inside back cover for a list of our valued partners.

### BUILDING FROM STRONG FOUNDATIONS

Some of the most important support for research comes from members of the public who give generously to Dalhousie University, Dalhousie Medical Research Foundation (DMRF), QEII Foundation, IWK Foundation, and other affiliated foundations. The Nova Scotia Health Research Foundation, meanwhile, channels tax dollars into research. These stalwart partners together give more than \$10 million a year to research, in the form of recruitment, equipment, operating, training and start-up grants, as well as matching funds for major projects. Local funding has leveraged millions more in external research funding over the past 10 years.

Foundations also work with private donors, health charities and the university to establish endowed research chairs. We now have a dozen endowed chairs, held by internationally renowned researchers who provide leadership in such key areas as Alzheimer's disease, autism, cancer, heart health, epilepsy, vision, and child and adolescent mental health.

### LIFE SCIENCES RESEARCH INSTITUTE (LSRI)

A joint venture of Dalhousie University, Capital Health and the IWK, the LSRI is a prime example of the power of partnership. Local commitments, including \$2 million from DMRF, helped secure \$5 million each from the Province of Nova Scotia and Nova Scotia Research and Innovation Trust (NSRIT), \$15

million from Industry Canada, and \$6 million from the Canada Foundation for Innovation to build the LSRI. The five-storey facility—home to state-of-the-art research labs—is twinned with the Innovacorp tower. Start-up companies and Innovacorp support programs are housed here, along with research-focused organizations such as NSRIT, BioNova and Springboard.

### IGNITE BRINGS ORPHAN DISEASES OUT OF THE COLD

A large-scale initiative to fast track the discovery of orphan-disease treatments, IGNITE is led by IWK/Dalhousie researchers **Drs. Chris McMaster** and **Conrad Fernandez**, and supported by a consortium of local and federal partners. Clinicians and scientists in medical genetics/genomics, molecular biology, pathology, ophthalmology, hematology-oncology, nephrology and other fields are working through this cross-country effort to identify genes and rapidly screen potential therapies. While each orphan disease is rare, together these 7,000 genetic diseases have a devastating impact.

### BEATRICE HUNTER CANCER RESEARCH INSTITUTE

Through her \$13 million gift to cancer research through DMRF, Beatrice Hunter set the stage for the creation of a cohesive Atlantic Canada-wide cancer research community. Formed by a coalition of partners, the Beatrice Hunter Cancer Research Institute provides funding, training, networking and direction to a dynamic cancer research effort involving more than 50 investigators, as well as trainees, charitable foundations and health care and educational institutions across the region.

the power of  
partnerships





building a thriving  
**economic**  
sector

## We're creating opportunities in tough economic times

As they pursue bold new solutions to pressing health problems, our 540 principal investigators are generating a powerful economic side effect. They're creating satisfying, well-paying jobs and promising business opportunities, while training key personnel and attracting the investment we need to build a thriving knowledge economy in Nova Scotia and the Maritimes.

Collaboration is the key driver behind the growing number of innovation success stories. Merging the expertise, creativity and ambition of our clinicians, scientists and engineers has ignited an explosion of ideas and new materials, drugs and medical devices to meet growing global demands.

### RESEARCH'S ECONOMIC RIPPLE EFFECTS

- Health research has created nearly 900 full-time staff positions and more than 1,000 training positions within our partner institutions.
- Our researchers secured \$85 million in funding in 2011-2012—70 to 75% of this went to trainee and staff salaries.
- This \$85 million generated an economic output of \$186 million, including \$8.8 million in tax revenues for Nova Scotia.
- Spin-off companies provide exciting opportunities for talented people in the Maritimes.
- A \$6.2 million investment in ICONS—Improving Cardiovascular Outcomes in Nova Scotia—generated \$10.2 million in wealth and saves \$3.5 million each year.



“Our greatest strength is the close interaction among clinicians, scientists and engineers—it allows us to zero in on the most important clinical problems and rapidly create the technological solutions. We have barely begun to scratch the surface of these opportunities in Atlantic Canada.”

**Dr. Daniel Boyd**, Faculty of Dentistry materials scientist, lead investigator of \$3.5 million in newly funded projects, CEO of ABK Biomedical Inc.



## Scientists and clinicians connect to take innovations to market

Halifax scientists are pioneering new materials with remarkable properties that hold immense potential for human health—and commercial success.

**Drs. Daniel Boyd and Mark Filiaggi**, materials scientists in Dalhousie’s Faculty of Dentistry, are transforming materials originally invented for dental uses into brand new substances with such diverse applications as the minimally invasive treatment of uterine fibroids and vertebral compression fractures. And, they’re doing it quickly, thanks to close working relationships with clinicians across the street.

“We’ve gone from a Post-it note to a company in 18 months,” says Dr. Boyd of ABK Biomedical Inc., a company he has launched with Capital Health/IWK interventional radiologist **Dr. Bob Abraham** and **Dr. Sharon Kehoe**, a postdoctoral fellow in applied oral sciences. “And now we’re gearing up to hire two employees for ABK and four for my lab.”

Through ABK Biomedical, the researchers are fine-tuning a new material for blocking blood supply to uterine fibroids, a common condition often solved by hysterectomy. Called OccluRad, it’s a granular glasslike material they’ve infused with radio-opaque particles so it’s visible on x-ray.

“This allows us to see exactly where the material is going when we inject it into the blood vessels that feed the fibroids,” says Dr. Abraham, noting that the material forms a plug that blocks the blood so tumours shrink and symptoms disappear—no surgery required. “Current materials can’t be accurately traced, so OccluRad makes the procedure safer and more effective.”



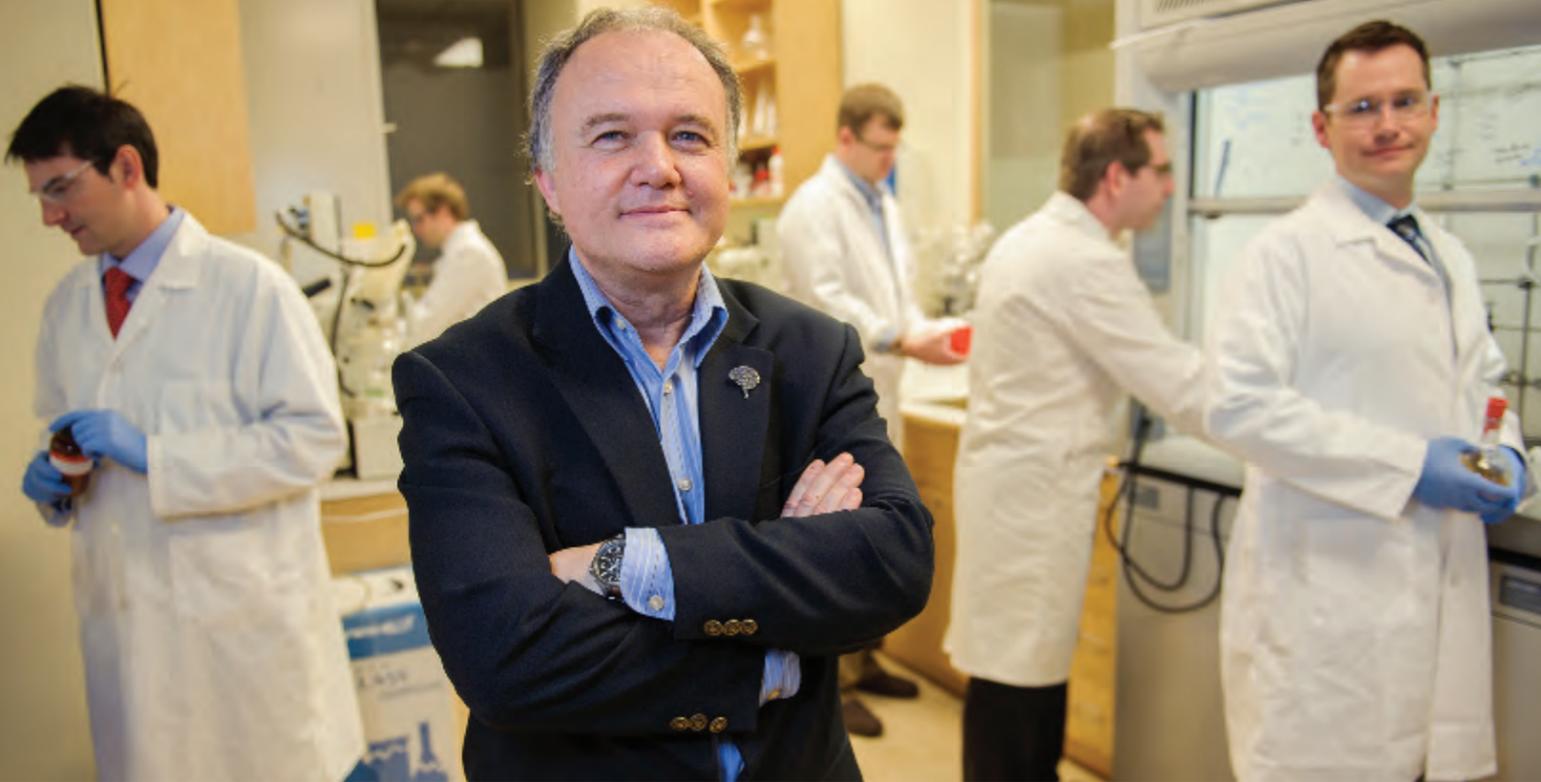
As an interventional radiologist, Dr. Abraham uses x-ray-guided injections of materials to treat many conditions—creating a wide open field of innovation for Drs. Boyd and Filiaggi and their teams. They’re working on several materials in addition to OccluRad, including bone cement with built-in healing properties.

“Unlike other bone cements, which just sit on the bone, this material chemically bonds with the bone,” says Dr. Filiaggi, explaining that the cement is injected into small fractures in the vertebrae to repair the breaks that are so common with osteoporosis and bone cancer. “At the same time, it releases bone-growth factors, so you get a very stable, solid fracture repair that prevents problems down the road.” He’s even found a way to permeate the cement with antimicrobials to reduce infection risk.

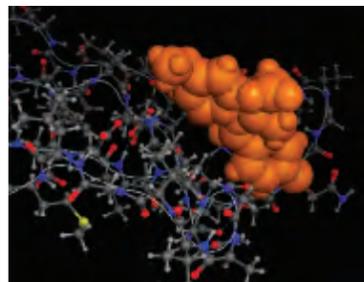
Orthopedic surgeon **Dr. Michael Dunbar** is keenly interested in the bone cements as a means of keeping hip and knee replacement implants firmly in place. “Movement between bone and implant dramatically increases the risk of implant failure,” he says. “These bone cements will have a major impact on outcomes... I see global demand.” So does the Atlantic Innovation Fund, which awarded the researchers \$2.5 million to develop the cements.

### THIS RESEARCH IS...

- pioneering bio-materials for minimally invasive procedures
- creating high-quality jobs
- developing a product that could circumvent millions of hysterectomies—saving billions of dollars and capitalizing on massive global market demand
- developing a bone cement that provides superior fracture repair
- creating platform technologies for other applications, including cancer treatment and joint-replacement surgery
- laying the groundwork for a Nova Scotia-based bio-materials manufacturing industry
- reducing risk and improving outcomes while cutting health care costs



## Treventis Corporation closes in on Alzheimer cure



**TOP:** Dr. Don Weaver leads the Treventis Corporation team of PhD chemists and biologists in Halifax (back, left to right): Drs. Mark Reed, Thomas Wood, Chris Barden, Robert Boudreau and Scott Banfield.

Dalhousie/Capital Health/IWK chemist and neurologist **Dr. Don Weaver** is determined to avert the global disaster of an unabated rise in Alzheimer rates. *"It's a global pandemic that will have a serious impact on the economy unless we find a disease-modifying drug,"* says Dr. Weaver, who happens to be on the trail of just such a drug. *"All we have now are drugs to treat symptoms or stabilize the disease. I'm after an agent that will stop the disease process in its tracks."*

A pioneer in the field of computer-aided drug design, Dr. Weaver launched Treventis Corporation in 2008 to synthesize and test new chemical entities against Alzheimer's disease. *"The team has created more than a thousand new compounds and found a number that clearly bind to the right targets to prevent the clumping of amyloid plaques that leads to Alzheimer,"* Dr. Weaver says.

Laboratory results in Halifax are so promising, Treventis is attracting American venture capital. The company has even hired a CEO in Philadelphia to

secure the investment needed for large-scale human trials.

Not satisfied with stopping Alzheimer's disease after it has wreaked havoc in the brain, Treventis is helping another Dalhousie/Capital Health neurologist commercialize his groundbreaking Alzheimer diagnosis technology. **Dr. Sultan Darvesh** has developed compounds that light up Alzheimer-specific brain changes in PET and SPECT scans, so the disease can be definitively diagnosed in living patients (autopsy is currently the only way to know for sure).

*"It's the one-two punch,"* notes Dr. Weaver. *"Our compounds will enable clinicians to identify Alzheimer before extensive damage is done and prescribe drugs to stop it from going further."*

A serial entrepreneur, Dr. Weaver is a founding member of several other Dalhousie-related spin-offs, including Mindful Scientific and DeNovaMed (see page 11).

## New technologies gain commercial traction

### SUPER-DRUGS FOR SUPERBUGS: HALIFAX TEAM LAUNCHES NEW CLASS OF ANTIBIOTICS

Scientists in Dalhousie's Faculty of Medicine and the IWK Health Centre have parlayed their knowledge of cell-membrane synthesis into the first new class of antibiotics to emerge in 30 years. Their spin-off company, DeNova-Med, recently received a \$100,000 early commercialization award from Innovacorp to prepare for clinical trials. The antibiotic, which destroys bacteria by dissolving their cell membranes, has proven extremely effective against MRSA and another superbug called VRE. These infections have increased 10-fold over the past decade and cause 50,000 deaths a year in Europe and North America. The researchers—**Drs. David Byers, Chris McMaster, Don Weaver and Chris Barden**—expect clinical trials to begin by 2014.

### NEW ASTHMA DIAGNOSIS DEVICE GAINS MOMENTUM IN THE UNITED STATES

Halifax-based spinoff company Thorasys Inc. has captured the attention of American respirologists, investors and industry through trade missions to the U.S. this past year. The company is developing and manufacturing the tremoFlo Oscillation Spirometer, a handheld device that allows clinicians to accurately diagnose asthma and other lung diseases and monitor how well medications are working. Developed by Dalhousie biomedical engineer **Dr. Geoff Maksym**, in collaboration with IWK and Capital Health respirologists, the tremoFlo offers many advantages over traditional spirometry. Atlantic Canada Opportunities Agency, BioNova, Innovacorp and others are helping Thorasys advance its new technology.

### CHECKING CONCUSSION: PORTABLE DEVICE PROTECTS AGAINST SERIOUS BRAIN INJURY

Spin-off company Mindful Scientific is developing a portable device that sports teams can use to take brain-function readings any time a player takes a hit to the head—so players don't risk more serious brain injury by getting back in the game too soon. Called the Halifax Consciousness Scanner, the device gives an objective measure of brain status within five minutes. Health professionals will use it to assess brain damage caused by trauma and stroke. Selected as one of the top medical technology companies in North America, Mindful Scientific showcased its product at the Life Sciences Alley expo in Minneapolis in December 2011. The researchers behind the company—**Drs. Ryan D'Arcy, Don Weaver and Chris Barden**—are affiliated with the IWK, Dalhousie, Capital Health and the National Research Council Institute for Biodiagnostics (Atlantic).



### WORLD-FIRST EAR-IMAGING TECHNOLOGIES

Halifax researchers are engineering new technologies that allow clinicians to see inside the middle and inner ear, where the delicate structures of hearing are hidden deep inside bone. Capital Health/Dalhousie ear surgeon and researcher **Dr. Manohar Bance** is working with engineering physicists **Drs. Jeremy Brown and Rob Adamson** to build tiny ultrasonic and optical probes to capture high-resolution images inside the ear. These technologies will allow clinicians to accurately diagnose ear pathologies, revolutionizing treatment of hearing-loss diseases. The researchers are commercializing the probes in partnership with Colibri Technologies. More recently they've licensed new-generation bone-conduction hearing aid technology to Ototronix.



building a thriving  
**economic**  
sector

An elderly couple is walking a large black dog on a sandy beach. The man is on the left, wearing a dark jacket and glasses, and the woman is on the right, wearing a red shirt and glasses. They are walking towards the camera. The background shows the ocean and a clear blue sky.

# keeping people moving

## We're keeping people moving in the face of chronic disease

Chronic disease takes an ever-growing toll of premature death and ongoing disability in the Maritimes. The human and economic costs are staggering—particularly in Nova Scotia, where rates of chronic illness and related disabilities are the highest in Canada.

Health researchers at Dalhousie University, Capital Health and the IWK Health Centre are alleviating these costs by helping people with chronic diseases self-manage their illness and become more physically active. This reduces their risk of further illness and hospitalization while promoting their overall health, independence and quality of life.

### CHRONIC DISEASE BY NUMBERS

- Chronic disease costs \$90 billion a year in Canada.
- Chronic disease represents 70% of the economic burden of illness in Nova Scotia.
- 25% of Nova Scotians have a disability that limits activity.
- Nova Scotia has Canada's highest reported use of disability days.
- 20% of Nova Scotians have arthritis or rheumatism.
- 16% of Nova Scotians have high blood pressure.
- In 2002, cardiovascular diseases cost Nova Scotia nearly \$960 million a year in direct and indirect costs, while cancer cost \$580 million. Arthritis and osteoporosis added another \$460 million to the burden.



“We’re creating tools for a patient-empowerment model of decentralized health care that makes care accessible in rural areas while reducing the costs and environmental impact of care. We envision selling these technologies around the world to generate wealth to sustain our own health care system.”

**Dr. Michael Dunbar**, orthopedic surgeon, professor of surgery and biomedical engineering, recipient of \$18 million in peer-reviewed grant funding since 2001



## Physiotherapists, engineers and surgeons keep osteoarthritis patients on the move



### Taking Trial-and-Error Out of Implant Selection

The researchers have found that certain gait and muscle-activation patterns cause some styles of implants to wiggle loose, while allowing other implant styles to remain stable. *“Now we have data that helps us select just the right implant for each patient,”* says Dr. Dunbar. *“This allows long-term pain-free mobility and reduces the need for surgeries to replace failed implants.”*

Physiotherapy professor **Dr. Cheryl Kozey**, biomedical engineer **Dr. Janie Astephen-Wilson** and orthopedic surgeon **Dr. Michael Dunbar** want pain-free mobility for people with osteoarthritis—whether they’re waiting for joint-replacement surgery or approaching their 20th year with joint implants.

*“Rising rates of obesity have tripled the demand for knee replacement surgery among middle-aged men and women in the past ten years,”* says Dr. Dunbar. *“Yet implants typically last less than 20 years. We must delay the need for surgery and prolong the life of implants so people can stay active. Their health literally depends on it.”*

Drs. Kozey, Astephen-Wilson and Dunbar are finding ways to do both. By studying the gait and leg-muscle activation patterns of hundreds of people over many years, they have identified ways of walking that wear down cartilage and cause osteoarthritis to develop and progress.

*“We can target these unique walking patterns with therapeutic exercise and training that can slow down the wear and tear on the joints,”* says Dr. Kozey. *“Correcting their walking mechanics allows people to put off joint-replacement surgery—easing the pressure on very long waitlists.”*

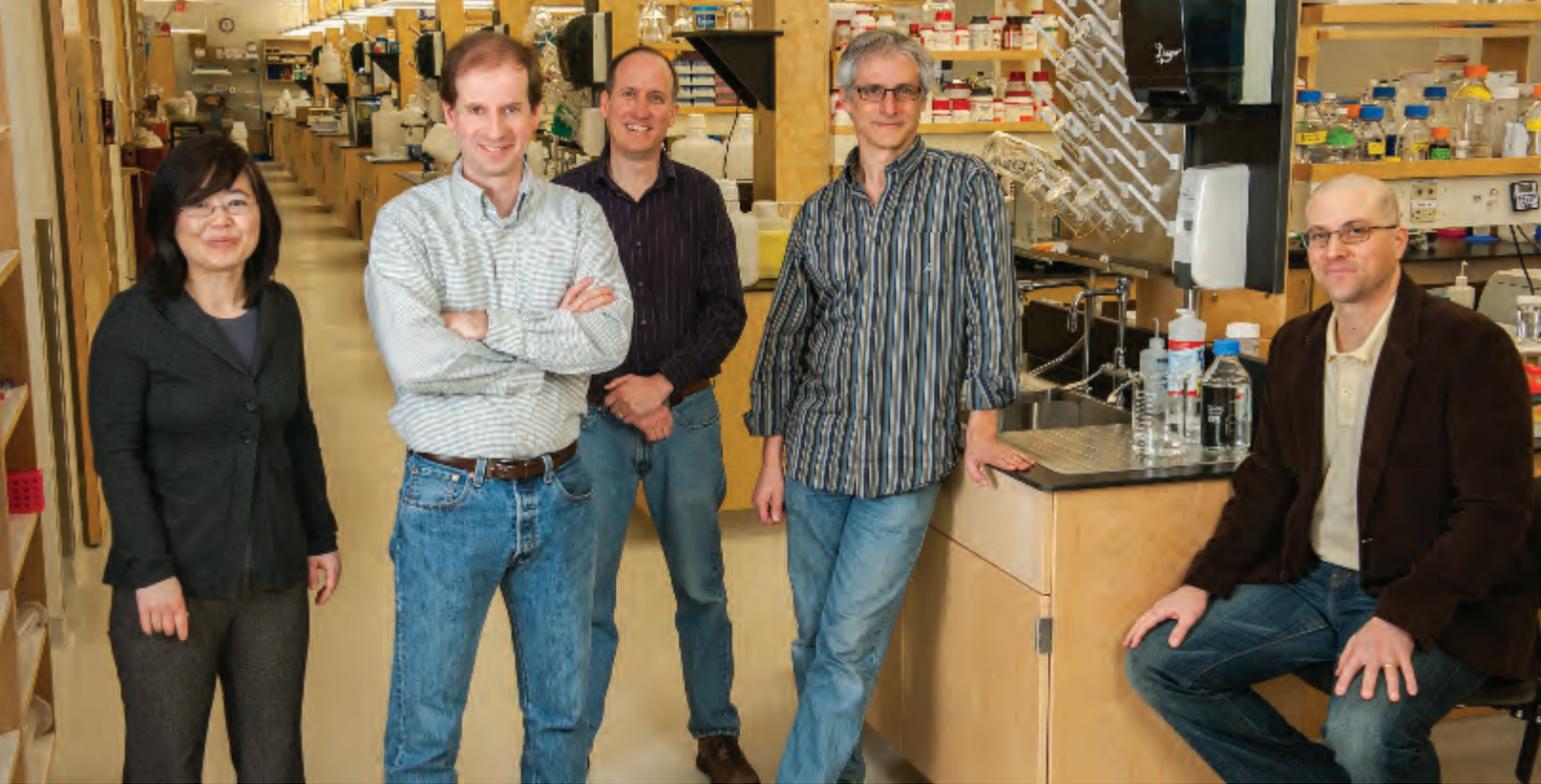
The researchers are also pioneering RSA testing (radio-stereometric analysis) to monitor the stability of implants after surgery, so failure-prone implants can be removed from use before they’re placed in thousands of patients. This work has led to substantial commercial activity. A spin-off company, Halifax Biomedical, is developing million-dollar RSA-testing software and equipment suites and selling them to leading health care institutions around the world.

### Smart Phones = Smart Follow-up Care

With colleagues in Dalhousie’s School of Biomedical Engineering, the researchers are developing a smart phone app that uses an accelerometer and EMG electrodes to capture and record data about patients’ gait and muscle-activation patterns. *“The app sends the information straight to us and tells us if your implant is likely to remain stable or if you need to come see us,”* says Dr. Dunbar. *“This will save patients unnecessary travel and give surgeons time to focus on the patients who really need to see us.”*

### THIS RESEARCH IS...

- cutting wait times for joint-replacement surgery
- giving pain-free mobility into old age for better overall health
- creating new technologies to make care more efficient and accessible
- saving money for the health care system
- creating high-quality jobs
- generating revenue through a Cape Breton-based spin-off company



## Mobility Project aims to restore lost abilities



**TOP:** Mobility Project scientists (left to right): Drs. Ying Zhang, Jim Fawcett, Vic Rafuse, Rob Brownstone and Angelo Iulianella are learning how the motor nervous system wires itself for walking.

Scientists, surgeons and rehabilitation specialists in the Maritimes are working together through the Atlantic Mobility Action Project to restore mobility and function to people whose nervous systems have been damaged by injury or disease. For some people, this could mean the ability to grip with one hand; for others, it could mean the ability to walk.

*"We're taking the broadest possible approach to the challenges faced by people who've been paralyzed by stroke or spinal cord injury, or who are slowly losing function due to neurodegenerative diseases like ALS and multiple sclerosis,"* explains **Dr. Rob Brownstone**, the Dalhousie/Capital Health neurosurgeon and scientist who founded the Mobility Project.

Dr. Brownstone is world-known for his groundbreaking discoveries of the neural mechanisms that enable people to walk. He and his colleagues at Dalhousie University hold millions of dollars in peer-reviewed funding to chart the development of the motor nervous

system and its control of walking—and hopefully unlock the door to revolutionary new therapies.

### Other members of the group are working to

- limit nervous system damage after spinal cord injury
- prevent and treat neuropathic pain, muscle spasms and urinary incontinence
- improve upper limb mobility and function
- discover the best rehabilitation methods for improving people's overall health, mobility and ability to function in their daily lives.

The Mobility Project fosters relationships with agencies that serve the people they aim to help—such as ALS Canada, the Canadian Paraplegic Association and the Rick Hansen Institute. As Dr. Brownstone notes, *"We want to ensure our research meets the real needs of people."*

## Effective rehab keeps chronic disease in check

### FINDING THE KEYS TO MOTIVATION

Physical activity improves life expectancy and quality of life for people with chronic diseases—but few are active enough to gain these benefits. Dalhousie/Capital Health exercise and health psychology researchers **Dr. Christopher Blanchard** and **Dr. Michael Vallis** (Capital Health Behaviour Change Institute) are learning what barriers prevent people with chronic disease from exercising and what factors enable and motivate them to stick with a rehabilitation program and stay active for the long term. They're working with physicians, therapists and exercise specialists to make a wide range of chronic disease rehab programs more effective.

### HEARTS IN MOTION DRAMATICALLY CUTS CARDIOVASCULAR RISK

Launched as a research project in 2006, Community Cardiovascular Hearts in Motion has so far reduced 1,200 people's cardiovascular risk—by 20 to 60% depending on their baseline risk. The community-based program helps people with or at-risk of cardiovascular disease change their eating and exercise behaviour. Participants maintain substantial improvements in cholesterol, blood pressure, blood sugar control, weight loss and exercise capacity beyond the program—and many eliminate obesity and smoking as risk factors. Program leads, cardiologist **Dr. Nick Giacomantonio** and dietitian **Wanda Firth**, are working with Dalhousie's Population Health Research Unit to measure how much money the program saves by averting emergency visits and hospital admissions.

### PULMONARY REHAB HELPS COPD PATIENTS BREATHE EASIER

Respirologist **Dr. Paul Hernandez** and physiotherapist **Dr. Gail Dechman** are helping people with COPD (chronic obstructive pulmonary disorder) develop physical fitness to breathe easier and manage the tasks of daily living. They're learning how to customize exercise programs to the particular challenges of COPD and finding ways to make these programs more accessible. They want to help people with this disabling disease remain independent and free of the flare-ups that land them in hospital.

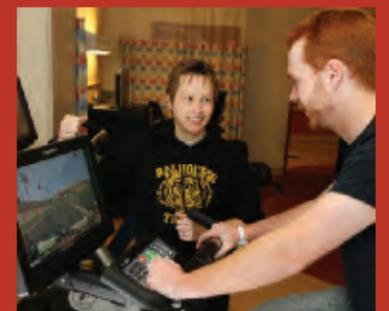
### ACTIVE GAMING FOR KIDS WITH CANCER

Exercise psychologist **Dr. Melanie Keats** and child hematologist-oncologist **Dr. Mark Bernstein** are making exercise fun in a new active-gaming lab at the IWK Health Centre. They want to know how exercise affects the mental and physical health of young cancer survivors—and if exercise can increase children's and teens' tolerance for cancer treatments and improve their health and long-term survival.

### STROKE SURVIVORS REGAIN ATTENTION WITH SOPHISTICATED BRAIN GAMES

Clinical psychologist **Dr. Gail Eskes** is developing the world's first cognitive repair kit to help people regain the ability to pay attention after a stroke. She's working with experts in attention, as well as computer scientists, software engineers, game programmers and other technical experts to develop engaging brain-training exercises targeted to each person's needs. Attention is the pivotal mental ability that allows people to follow a physical rehab plan and manage independently in their day-to-day lives.

keeping people  
moving





helping the people who  
**need** it most

## We're helping people through their challenges

Whether someone is old and frail with many health problems, is living in poverty, pain or isolation, or facing other circumstances that undermine their mental or physical health, they need help. Family caregivers often step in, but they too can buckle under the strain and may end up needing help themselves.

Our health researchers are deeply committed to learning what supports and services people in challenging situations really need. They're working with communities, agencies, health care providers and other partners to design and test new programs and approaches to meet those needs. Their work is steadily improving the health and wellbeing of some of our most vulnerable citizens and the people who care for them.

### A SNAPSHOT OF VULNERABILITY

- One-fifth of Canadians over the age of 72, and one-half over the age of 85, are frail and vulnerable to sudden downturns in their health.
- More than 8,000 children are referred to child welfare services in Nova Scotia each year.
- One-quarter of Canada's Aboriginal children live in poverty and more than 40% lack access to basic dental care.
- One in five Canadians suffer from chronic pain; for many this leads to lower income and even loss of employment.
- Nearly 12,000 Maritimers will receive a cancer diagnosis in 2012.



“We need to develop a new mindset and positive skills to effectively meet the complex needs of frail seniors. Doing so will enable us to provide more respectful, compassionate care to people and their families, at less cost to the system.”

**Dr. Kenneth Rockwood**, Kathryn Allen Weldon-Dalhousie Medical Research Foundation Chair in Alzheimer Research, director of geriatric medicine research, founder of Dementia-Guide Inc.



## Charting a sea change in care for frail seniors

Researchers at Dalhousie University and Capital Health are changing how the health care system looks after frail seniors. “We’re leading a paradigm shift that will dramatically improve the wellbeing of seniors with multiple health problems,” says **Dr. Kenneth Rockwood**, a renowned researcher who has pioneered worldwide recognition of frailty’s impact on health outcomes.

As Dr. Rockwood explains, a frail person has numerous interacting health problems, but trying to solve each problem does not have the desired effect. “We end up with people on so many medications, they are in a fog that impairs function and increases their risk of falls,” he says. “We can’t fix all the problems, but we can care for people.”

With help from Dalhousie mathematician **Dr. Arnold Mitniski**, Dr. Rockwood and his colleagues in Geriatric Medicine have developed a comprehensive geriatric assessment (CGA) that allows them to accurately predict if a person’s health will recover, stabilize or decline.

### A Path to Better Medical Decision-Making

Accurate assessment tools help health care professionals work with patients and families to make appropriate health care decisions—such as to continue or discontinue certain drugs, or to opt out or go ahead with surgery.

Dalhousie/Capital Health cardiac surgery researchers, led by **Dr. Greg Hirsch**, are exploring how the CGA and a more in-depth shared decision-making and informed consent process can improve outcomes of cardiac surgery and patients’ satisfaction with care. In the Palliative and Therapeutic Harmonization (PATH) Clinic, geriatric medicine specialists **Drs. Laurie Mallery** and

**Paige Moorhouse** are helping frail patients and their families make wise medical decisions—to avoid unnecessary suffering from futile interventions and promote dignity in the last months of life.

“Half our health care dollars are spent on services during the last year of life, and half of that is in the last three months,” notes Dr. Rockwood. “Research is showing us how we can make decisions that provide better care while also saving money.”

### Better Oral Health for Better Health and Quality of Life

Dentistry professor **Dr. Mary McNally** is working with partners across Nova Scotia to improve the oral health of nursing home residents. “On top of the pain it can cause, poor oral health contributes to frailty, because it leads to poor nutrition and social isolation,” explains Dr. McNally. “It has a real impact on quality of life.” She and her colleagues have developed oral health tool kits, training manuals and videos now being used in nursing homes across the province, and are working with the Nova Scotia Community College to provide oral care training to students in the continuing care assistant program.



### THIS RESEARCH IS...

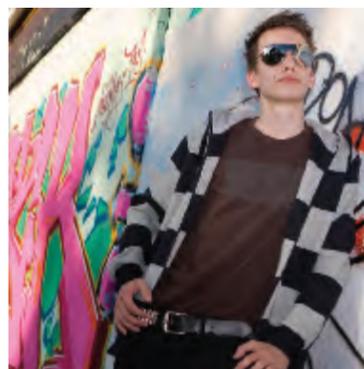
- revealing the importance of frailty as a predictor of patient outcomes
- developing protocols to support better health and quality of life for frail seniors
- creating tools to support better medical decisions, including a ‘smart bed’ that gauges health-status improvements and declines
- charting a course for more cost-effective, more compassionate care
- influencing the design of health care systems around the world



## Dalhousie-Phoenix partnership fosters resilience in youth at-risk

**TOP:** Dr. Michael Ungar (right) and Phoenix Youth staff (left to right): Fiona McAdam, Dave Mitchell, Rachel DeRocher, Alison Little and Simon Abbott help youth rise above their circumstances.

Dalhousie-based Resilience Research Centre and Phoenix Youth Programs are learning how to help at-risk youth get back on track to a healthy future. The centre is gathering data from young people involved in child welfare, mental health and other services, like Phoenix, and using the findings to help its community partners design more successful programs.



*"We've identified specific ways to help young people do better in the face of adversity,"* notes **Dr. Michael Ungar**, social work professor and founder of the Resilience Research Centre. The centre partners with the IWK's Centre for Research in Family Health and the Child Soldier Initiative to foster resilience among youth in challenging circumstances around the world.

*"Poverty, neglect and abuse are key threats to a child's healthy future,"* Dr. Ungar says. But he and his colleagues have found that fostering resilience can alter the course of a young person's life—away from substance use, home-

lessness, crime and other harmful paths.

*"The research has shown us youth do much better when they feel heard, understood and respected, and that someone will advocate for them,"* says Phoenix intake manager, **Fiona McAdam**.

### Phoenix translates the research through programs that help youth

- access food, shelter and safe havens
- form secure relationships with adults and peers
- build stronger connections to family, school and community
- identify strengths and develop skills
- gain a sense of belonging and contribution.

Phoenix programs include artistic projects, such as a choir that has performed in Quebec. *"We had such a big sense of pride and accomplishment,"* says one choir member; another adds, *"This is a gift for everyone. This is hard work, this is strength."*

## Innovative projects help people overcome challenges

### STRONGER ECONOMIES FOR ABORIGINAL COMMUNITIES

Dalhousie Aboriginal health researchers and their colleagues across Canada are working with the Assembly of First Nations to help Aboriginal communities build stronger, sustainable economies for better health and wellbeing. The five-year, \$2.5 million Poverty Action Research Project is helping five Aboriginal communities, including Nova Scotia's Indian Brook Nation, develop and implement strategic plans for economic growth. **Dr. Fred Wien**, a professor emeritus in Dalhousie's School of Social Work, is national lead of this Canadian Institutes of Health Research-funded project—as well as many other national multi-institutional Aboriginal research efforts.

### TACKLING THE PERSISTENT PROBLEM OF PAIN

Sometimes called 'the invisible epidemic,' chronic pain affects roughly six million Canadians. Researchers at Dalhousie, the IWK and Capital Health are global leaders in efforts to counter the plague of pain. Psychologists, nurses, surgeons, anesthesiologists and others are collaborating to better understand and manage procedural pain and to prevent and alleviate chronic pain—which can result if acute pain is not managed properly. They're working with newborn twins in intensive care, mothers in labour, women undergoing breast cancer surgery, adults with chronic neuropathic pain, and children in developing countries and at home, to find new ways to reduce the suffering of people in pain.

### REMOTE ABORIGINAL COMMUNITY EMBRACES ORAL HEALTH

Dental decay and gum disease is epidemic in remote Aboriginal communities with limited access to fresh, healthy foods and sporadic access to routine dental care. That's why **Dr. Debbie Martin**, a researcher in Dalhousie's School of Health and Human Performance, and her colleagues in the Faculty of Dentistry, are working with the Inuit-Métis communities of NunatuKavut, Labrador to improve oral health. A native of NunatuKavut herself, Dr. Martin is involving the community in finding creative ways to promote healthier eating and better oral hygiene practices for healthier smiles and better overall health. This project will pave the way to oral health promotion programs in other Aboriginal communities.

helping the people  
who need  
it most



### HELPING COUPLES COPE WITH CANCER

When aggressive cancers strike in the prime of life, couples struggle with work, parenting, financial and relationship issues, on top of the disease and the very real possibility of death. **Dr. Deborah McLeod**, a professor in the School of Nursing and clinician scientist with the Capital Health Cancer Care Program, is determined to help these couples. She's a leading force in developing and testing online support groups and education programs that help the person with cancer and their partner and caregivers manage everything from pain and nausea to anxiety, insomnia, sexual problems and depression. Her goal is to improve quality of life through cost-effective interventions that are available to everyone, no matter where they live.



# Leading the way to better care

We're improving quality, safety and efficiency of health care

Researchers in Dalhousie University's health faculties, Capital Health and the IWK Health Centre are leading the way to better health care in Nova Scotia and far beyond. From working with governments, health care providers and educational institutions to plan a system that makes optimal use of health human resources, to re-designing key aspects of primary, acute and continuing care, our researchers are informing positive change.

At the same time, our researchers are using technology and new models of care to deliver health services to people in their homes. They're finding ways to improve safety and outcomes, relieve pressure on emergency departments, and save health care dollars. The end result of all their efforts: better, more efficient, accessible and cost-effective care—and healthier people of all ages and stages of life.

## PROBLEMS OUR RESEARCH IS HELPING TO SOLVE

- The Canadian Adverse Events Study found that 70,000 of 185,000 adverse events in hospitals in 2000—and up to 24,000 deaths—could have been prevented.
- The shortage of registered nurses in Canada could reach 60,000 by 2022 if changes aren't made to improve productivity and retention.
- 20% of Canada's children and youth have mental health problems; 75% of children who need treatment don't get it.
- Drug interactions cause 150,000 emergency room visits and 10,000 deaths per year across Canada.



“Cost-cutting does not necessarily result in cost-savings, because cuts on one end can lead to costly re-admissions on the other. We need to intelligently re-model our health care system to meet future needs efficiently and cost-effectively.”

**Dr. Gail Tomblin Murphy**, professor of nursing and director of the World Health Organization/Pan American Health Organization Collaborating Centre on Health Workforce Planning and Research



## Planning health human resources to meet future needs

**Dr. Gail Tomblin Murphy** knows you have to look at the big picture when planning health human resources to meet health care needs of the future.

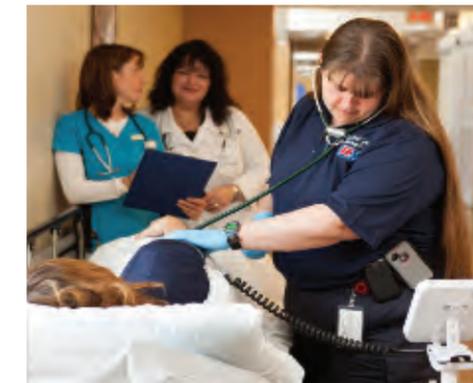
*“You can’t see how many people a single health profession will need by looking at it on its own,”* says Dr. Tomblin Murphy, a former frontline nurse who now heads the Dalhousie University/World Health Organization Collaborating Centre on Health Workforce Planning and Research. *“You have to look at the broad health needs of society and determine what mix of health human resources can best meet those needs.”*

Dr. Tomblin Murphy and her team—whose members represent fields including health economics, epidemiology, political science, law and engineering—use simulation models and other analytical techniques to explore how changing demographics and disease burdens may influence future needs for health services. They work with governments, providers and educational institutions to plan how the system can be remodeled and staffed to meet these needs. In fact, the federal government and all provincial and territorial governments in the country have adopted the team’s health human resources planning framework.

### The Right People in the Right Place with the Right Service

*“It’s not just a matter of planning for the people who will deliver the care,”* notes Dr. Tomblin Murphy. *“It’s designing a system that puts the right resources in the right places at all levels of the system, from primary care to acute, tertiary and continuing care, so that needs are met in a cost-effective way.”*

In Nova Scotia, Dr. Tomblin Murphy and her colleagues work with the provincial government, the health districts and the IWK to plan for the future and evaluate the impact of new models of care on health outcomes, costs, and patient and provider satisfaction.



*“We’ve found that well-coordinated team-based care leads to shorter hospital stays, fewer re-admissions, and fewer missed shifts due to injury for providers,”* she says. *“And the more teams use the best available evidence and involve patients in decision-making, the fewer the medical errors and the better the patient outcomes. These improvements translate into major savings, as well as higher retention of health care workers.”*

### Addressing Human Resource Shortages

Dr. Tomblin Murphy and her team have found that, if health care institutions continue to make less-than-optimal use of registered nurses’ skills, the RN shortage in Canada will hit 60,000 by 2022. Their work has shown how policy and staffing changes that reduce injuries and absenteeism and improve productivity and job satisfaction can largely offset this shortfall. Her team’s research (which has received \$7.2 million since 2003) is helping not just Canada, but Brazil, Jamaica, Zambia and other nations, plan for the future.

### THIS RESEARCH IS...

- mapping future health care needs and the human resources required to meet them
- identifying how governments, providers and educational institutions can cultivate the necessary human resources
- developing and analyzing health care models to optimize the use of people’s skills
- helping governments plan to mobilize human resources to meet specific high-intensity needs like H1N1 and SARS outbreaks



Strongest Families coach Katie LaVigne works with six or more families every shift.

## Strongest Families takes mental health care into the home

Strongest Families offers an innovative approach to mental health service delivery that's catching on. The program, which began as a research project at the IWK Health Centre, uses the telephone to connect highly trained coaches with families who need guidance and support in resolving their children's mental health problems.



*"We've overcome the key barriers that prevent families from accessing care,"* says **Dr. Patricia Lingley-Pottie**, President and Chief Operating Officer of the Strongest Families Institute. *"We've removed the inconvenience and expense of traveling to clinic appointments, while creating new capacity to provide the care."*

There aren't enough professional therapists to meet the needs. Strongest Families frees the professionals to handle severe situations, by using trained non-professional coaches to help families resolve their children's mild to moderate mental health issues—with a focus on anxiety and behaviour problems.

*"We intervene early, so families can solve the problems before they're entrenched,"*

says IWK/Dalhousie child psychologist and Strongest Families founder **Dr. Patrick McGrath**. *"Untreated, childhood mental health problems can lead to serious mental health issues in adulthood, including a high risk of addiction and crime."*

**Strongest Families is proving to be both cost-effective and effective:**

- 85% of participants report positive results
- fewer than 10% drop out, compared to 40 to 60% from conventional services
- treatment is one-third the per child cost of conventional treatment
- help can easily be provided to remote and under-served communities.

Now a freestanding not-for-profit institute, Strongest Families provides service on a contract basis. Health authorities in British Columbia, Alberta, Ontario and all across Nova Scotia have tapped in to Strongest Families—and there is strong interest in other countries around the world.

## Research improves care, takes pressure off emergency

### BETTER ACCESS, BETTER QUALITY PRIMARY CARE

Dalhousie/Capital Health family medicine researchers are pioneering the 'open access' model of primary care, which reserves more than half a family physician's openings for same-day appointments. This allows people to see their own doctor or nurse quickly, instead of going to emergency or a walk-in clinic. The researchers' trial has demonstrated a significant reduction in wait times, a decline in no-show rates, and improved patient satisfaction.

### DESIGNING BETTER NURSING HOME CARE

**Dr. Barry Clarke**, medical director of Integrated Continuing Care for Capital Health, has developed a new approach to nursing home care that's providing better care to residents while saving millions of dollars each year. *Care by Design* is based on physician-anchored care teams, timely and comprehensive assessments, and careful coordination with acute care providers. Evaluations led by Dalhousie family medicine researcher **Dr. Emily Marshall** show improved continuity and quality of care in the nursing homes and dramatic reductions in transfers to hospital. She's also examining *Care By Design's* impact on overmedication, falls and satisfaction with care.

### POST-OP RECOVERY APP FOR SAFER SURGERY

The Patient Safety Company has signed a license agreement with Dalhousie University for SAFER, a web-based program developed by IWK gynecologic surgeon **Dr. Donna Gilmour**. The app helps women identify symptoms of adverse events after hysterectomy and c-section and directs them to the

appropriate health care provider. SAFER also offers daily tips to enhance women's post-operative recovery. The Patient Safety Company will make the app available to patients, health care providers and hospitals around the world, to track/analyze post-surgical problems and improve safety and quality of care.

### BETTER CARE FOR BIPOLAR DISORDER

**Dr. Martin Alda**, Capital Health psychiatrist and Killam Chair in Mood Disorders, is working toward a definitive test of lithium response in bipolar patients. He wants to ensure that all bipolar patients who can benefit from lithium can take the medication safely. Not only does it control mania and depression, lithium appears to protect the brain from bipolar-related changes, including those that may put patients at high risk of Alzheimer's disease.

### SAFE, COST-EFFECTIVE DRUG USE AND PRESCRIBING

Pharmacy professor **Dr. Ingrid Sketris** wants to make sure Nova Scotians are taking the right drugs at the right doses for their conditions, with less risk of dangerous drug interactions that could land them in emergency. She and her team analyze prescription data to see if drugs are being properly prescribed and feed their findings back to clinicians and government. They also evaluate drug information software designed to help clinicians make the best and safest prescribing decisions. The team's discovery that puffers work as well as nebulization machines for adults and children with respiratory disease is saving the Nova Scotia government more than one million dollars a year.

leading the way to  
better care



creating a  
**healthier**  
tomorrow



## We're setting our sights on a healthier future

Looking to the future, we can see many health challenges for Nova Scotia and the rest of Atlantic Canada. Collectively, we have the oldest population, the highest rates of risk factors for chronic disease, and the heaviest burdens of inherited and chronic diseases in Canada.

Yet, our researchers have an optimistic vision. They see opportunities for enormous progress and are working hard to improve the health of the next generation. For some that involves learning how to optimize a baby's health before he or she is even born. For others, it means finding ways to protect children from injury and illness, to inspire them to be physically active, and to set them on the path to a healthy life from an early age. For all of them, research means hope.

### CHALLENGES WE FACE

- One-third of Nova Scotia's grade five students are overweight or obese.
- Obesity is a leading risk factor for diabetes, heart disease, cancer, depression and many other health problems.
- Atlantic Canada has the highest cancer rates in Canada; at current rates, one-third of Atlantic Canadians will develop cancer over the course of their lives.
- Rates of Chlamydia have risen by 70% in Canada since 2000; rates of other sexually transmitted diseases are also rising.
- Although child and youth injury rates are declining, child and youth injuries cost an estimated \$5 billion per year in Canada.



“Obesity is not just an issue of individual choice or family lifestyle... there are so many factors in our culture, environment and economic system that promote obesity. There’s no simple fix, but we’re working with many partners to find solutions to an incredibly complex problem.”

**Dr. Sara Kirk**, Canada Research Chair in Health Services Research, Dalhousie School of Health and Human Performance, IWK Health Centre, Atlantic Health Promotion Research Centre



## A big-picture approach to reversing the obesity epidemic

A 2011 survey of grade five children across Nova Scotia found that a third of the children were overweight or obese, despite greater public awareness and attempts to make healthier foods available in schools. It’s a trend that’s taken hold all across Canada, but with the greatest impact in Atlantic Canada.

**Dr. Sara Kirk**—Canada Research Chair in Health Services Research—is one of many researchers at the IWK Health Centre, Dalhousie University and the Atlantic Health Promotion Research Centre examining the problem.

### Making the Economic Link

In May 2012, Dr. Kirk and her colleagues released results from the 2011 Children’s Lifestyle and School performance Study (CLASS II), which surveyed 5,500 grade fives across Nova Scotia. Not only did they discover a continued trend to overweight and obesity, they found that one in five families face food security issues. This is on top of the 2003 CLASS I study, which found that the students with the healthiest diets were 30% less likely to fail their elementary literacy assessments than their less well-fed peers.

*“Health and education are tightly woven together... you need to be well nourished to learn,”* notes Dr. Kirk. *“Nutrition is not just a health issue... it’s an economic issue with major implications for our future prosperity.”*

Dr. Kirk is exploring food security issues with colleagues at Mount Saint Vincent University, including Nova Scotian families’ ability to access healthy, affordable foods. She has also launched the TIME study (Tools, Information, Motivation, Environment) to track family eating habits and lifestyles (screen time,

time being physically active) and learn what helps and hinders them.

*“Many solutions fall outside the health system,”* she says, citing community gardens, public cooking classes, stricter food-industry regulations, safer cities, bike-friendly roads, and poverty reduction among a long list of interacting solutions. *“We’re engaging schools, communities, health professionals, governments and many others in our efforts to reverse the obesity trend.”*

### Examining Triggers and Outcomes

A growing group of researchers in the IWK/ Dalhousie Department of Obstetrics & Gynecology is exploring biological causes and long-term outcomes of obesity. Physiologist **Dr. Younes Anini** is exploring basic mechanisms that control appetite and energy balance, while epidemiologist **Dr. Christy Woolcott** is analyzing large datasets to see how mothers’ pre-pregnancy weight and weight gain during pregnancy may influence their unborn children’s later risk of obesity and type 2 diabetes. Physician/epidemiologist **Dr. Stefan Kuhle** wants to know how childhood obesity affects children’s health and use of health services as they grow up, and what this costs to the system. He will also conduct economic evaluations of school-based obesity prevention programs.



### THIS RESEARCH IS...

- identifying key factors that contribute to obesity
- monitoring causes, incidence and impact of unhealthy weights in schools
- forging broad-based partnerships to address obesity’s causes
- informing public policy for a healthier future
- developing tools and programs to help families eat and live healthier



Among her many projects, research scientist Dr. Jun Wang is pioneering a Chlamydia vaccine in the Canadian Center for Vaccinology at the IWK.

## Vaccine research harnesses power of prevention

As new infectious diseases emerge and rates of existing infections rise, researchers in the Canadian Center for Vaccinology (CCfV) are hard at work on new vaccines and strategies to check the spread of these diseases.

*"Vaccines are one of society's most powerful tools," says Dr. Scott Halperin, director of the CCfV, a highly successful, influential collaboration of the IWK, Dalhousie University, and Capital Health. "Formerly devastating diseases like polio and diphtheria have been virtually banished, but we face ongoing challenges around the world."*

Dramatic increases in sexually transmitted diseases—such as recent rises in Chlamydia rates across the Maritimes—are particularly alarming.

More than 40 investigators are involved in the CCfV: basic scientists working on new vaccines, clinicians evaluating vaccines, and policy experts advising governments on the effective and cost-effective use of vaccines.

### Our researchers' efforts include

- pioneering vaccines against Chlamydia, dengue, RSV, hepatitis C and other diseases with no vaccine
- learning how to provide the best long-term protection against HPV
- partnering with industry to make influenza vaccines stronger and longer lasting
- making vaccines more effective in people with weaker immune systems
- increasing influenza vaccine uptake among health care workers and pregnant women
- protecting newborns by proving the safety and effectiveness of vaccinating pregnant women (i.e. against pertussis and group B streptococcus).

The CCfV is also a key player in the Pan-Provincial Vaccine Enterprise (PREVENT), a national vaccine commercialization consortium funded through the Network of Centres of Excellence. PREVENT is currently focused on preventing group A streptococcus infections and their potentially serious complications.



## Forward-looking research for healthier futures

### PREVENTING SERIOUS INJURIES

As a surgeon in the IWK's emergency department, **Dr. Natalie Yanchar** has seen the tragic results of injuries that could have been prevented. Her research has influenced provincial legislation to protect the safety of children and youth—including legislation to restrict the operation of all-terrain vehicles, which has dramatically reduced injuries in children under the age of 14. Dr. Yanchar and her colleagues also showed the need for better legislation on motor vehicle restraints for children. Combined with public education, new legislation mandating booster seats for children too small to use a seat belt alone has resulted in more than 90% of Nova Scotia's children using the appropriate restraint system when travelling our roads and highways.

### ATLANTIC PATH ON COURSE FOR A HEALTHIER TOMORROW

The Atlantic PATH aims to collect demographic data, blood samples, toenail clippings and other information from 30,000 volunteers across the Atlantic provinces over the next few years. The Dalhousie, IWK and Capital Health researchers, led by **Dr. Louise Parker**, Canadian Cancer Society Chair in Population Health Research, are searching for clues as to what environmental and genetic risk factors play the most important role in the region's high cancer rates. Their findings will shed light on new methods of detecting, preventing and treating cancer in the future.

### FRIENDS HELPING FRIENDS BE HEART HEALTHY KIDS

The Maritime Heart Center (MHC) is working with a number of schools to harness the power of peer pressure to inspire kids to be more physically active. The MHC's Heart Healthy Kids (H2K) program—launched by cardiac surgeon **Dr. Camille Hancock-Friesen**—has found peer mentoring encourages substantial increases in physical activity at school (1,000 more steps per child per day on average, measured by pedometer). The MHC hopes to expand the program to more schools across Nova Scotia, to help create a culture of physical activity. The Nova Scotia Health Research Foundation, QEII Foundation, IWK Foundation and other partners have made H2K possible.



### TOWARDS A SAFER IN-UTERO ENVIRONMENT

Perinatal epidemiologist **Dr. Linda Dodds** is the IWK lead of a national CIHR/Health Canada-funded 10-centre study examining the impact on infants of pre-natal exposure to common chemicals. The researchers have collected and are analyzing blood and urine samples from 2,000 pregnant women, and stool and cord blood samples from their newborn babies, to determine what chemicals are present. They're comparing this data to their in-depth assessments of the infants at birth and six months later, to see what anatomical, developmental and behavioural issues may be linked to pre-natal chemical exposures. Their findings will help policymakers, health care providers and mothers-to-be take steps to prevent potentially harmful exposures.



creating a  
**healthier**  
tomorrow

# the opportunity ahead

We stand at a critical turning point in Nova Scotia and the Maritimes.

We stand at a critical turning point in Nova Scotia and the Maritimes. An aging population, rising disease burdens and steadily increasing costs mean our health system cannot be sustained in its current form. We must change how services are delivered, we must improve outcomes, and we must improve the health status of our population to maintain a health care system that works.

**Research is the only way to ensure we make the right decisions in the months and years ahead.**

Research offers the opportunity to design a sustainable health system. It also offers the opportunity to create a thriving health sciences sector that stimulates job creation and economic growth for our region. All while delivering breakthrough technologies, powerful new treatments and vastly improved models of care.

So much has been invested—in terms of money, time, creative energy, and the painstaking, tireless efforts of our brilliant and dedicated researchers. The world is taking notice of great things being accomplished right here in the Maritimes. Our dynamic teams, supportive environment and collaborative culture are attracting incredible talent from all over the world.

Now is the time to reap the rewards of the tremendous work that's been done and to nurture the research that promises to help us solve challenges and create opportunities. The health of future generations, the survival of our health care system, the strength of our economy and the vibrancy of our society depend on it.



## working together

We are continually grateful to the donors, charitable foundations, funding agencies, investors and industry partners who support our work. **Some of our key partners include:**

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Assembly of First Nations  
Atlantic Canada Opportunities Agency  
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Beatrice Hunter Cancer Research Institute  
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