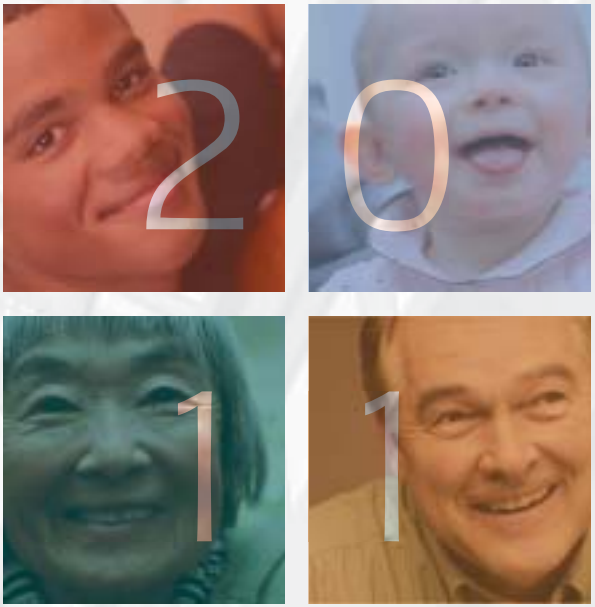
Windows on Research | 2011



Hamilton Health Sciences

Windows on Research – Research at Hamilton Health Sciences is diverse, innovative and comprehensive. This publication provides a glimpse into some of our organization's many research projects, programs and initiatives. Together, they account for more than $200 million in annual funding. They also represent hope, healing and the vision for a healthier future, worldwide.

Research Vision

Hamilton Health Sciences will be a world leader in advancing and creating new knowledge that informs patient care by bringing evidence into practice through translation and application.

Contents

Getting the picture with PET imaging

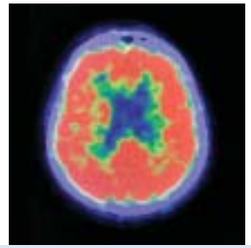
“It is only through research that we can improve health care,” says **Dr. Mark Levine**. It was this philosophy that drove Dr. Levine to establish the Ontario Clinical Oncology Group (OCOG) nearly 30 years ago, and it is this philosophy that drives him today.

As Dr. Levine explains, patient-focused cancer research cannot exist without some kind of support. This is where OCOG comes in. OCOG is an organization of clinicians, methodologists, statisticians, trial coordinators and programmers who work with a network of Canadian and international researchers to design, coordinate and publish clinical trials.

Currently, OCOG is studying new radiation treatments in early breast cancer and prostate cancer. If these approaches are effective and safe, they will be more cost effective and more convenient for patients.

OCOG is also interested in incorporating new imaging tests into regular clinical practice. Researchers are studying the use of Positron Emission Tomography (PET) scanning, which allows physicians to detect cancer. Since 2004, OCOG has studied the use of PET scans for breast, lung, head and neck, colon, and cervix in more than 3,000 Ontario patients. Most recently, researchers have begun studying the use of PET scans to detect recurring cancers. If the scans prove to be effective, this would reduce the need for invasive diagnostic surgery.

“I am a big believer in conducting research that is a team effort and that provides the best evidence on how to best take care of patients,” Dr. Levine says. “It is this kind of research that OCOG is dedicated to supporting.”



far left: Dr. Mark Levine, shown here, has made invaluable contributions to cancer research through OCOG.
top left: Bronwen Baylis, the manager of Diagnostic Imaging at the Juravinski Hospital, is all dressed up for the 2009 BRIGHT Run. This event is held every year to support breast cancer research at the Juravinski Cancer Centre. **top right:** PET images, like the one shown here, can help physicians identify cancer. Now, OCOG researchers hope to find that this imaging system will be able to help identify recurring cancers as well.
bottom: PET scans could help detect recurring cancers in patients, reducing the need for invasive diagnostic surgery.

Helping women to say "yes" to clinical cancer trials

According to a study conducted by radiation oncologist **Dr. James Wright** several years ago, many breast cancer patients say "no" to participating in clinical trials because they are already overwhelmed by the stress of their primary treatment decisions and often feel that a clinical trial would add to this stress.

In fact, only two to three per cent of all patients eventually say "yes." Dr. Wright feels this number could and should be closer to 10 per cent.

Part of the solution, Dr. Wright says, lies in contacting and educating patients about clinical trials well before they begin treatment. By educating patients about what clinical trials are, and giving them plenty of time to consider their options, Dr. Wright and his colleagues hope that more women will choose to participate.

"If we can recruit patients more quickly and reduce the time it takes to do clinical trials, we can bring advancements in cancer treatment into practice sooner," Dr. Wright says.

For many women, agreeing to participate in a clinical trial means that, by doing so, they may be improving treatment for a loved one who could have cancer in the future. For most women, potentially saving the life of a daughter, granddaughter or niece is not a difficult decision to make – they just need time to make it.

Less is more with breast cancer radiation

Dealing with the diagnosis of breast cancer is difficult enough. For many women, dealing with weeks of radiation treatment only adds to this difficulty.

Three years ago, radiation oncologist **Dr. Tim Whelan** began investigating the possibility of accelerated partial-breast radiation, which treats only the affected part of the breast as opposed to the entire breast. Unlike the whole-breast radiation treatment currently in practice, which lasts three to six weeks, partial-breast treatment takes just one week.

According to a pilot project of 100 breast cancer patients, partial-breast radiation was not only shorter, but also showed very low rates of recurrence of the cancer. Shorter treatments mean less time away from family and often less discomfort from side effects. Dr. Whelan is hopeful that the larger trial currently underway will show similar results.

"Breast cancer is a serious diagnosis for women," Dr. Whelan says. "Then they have to deal with a lot of different treatments. If we can reduce some of this therapy it would be much easier for women to cope."

top left: Dr. James Wright, shown here, believes that educating patients about clinical trials before their treatment even begins will increase participation. **top right:** Dr. Gurmit Singh, shown here, has carved a new niche in the world of cancer research with his specialized breast cancer pain studies. **bottom:** Dr. Whelan, shown here, has brought the possibility of shortened, partial-breast radiation to the forefront with his latest research.

Taking the pain away for breast cancer patients

Since joining the Canadian Breast Cancer Foundation's National Board of Directors, **Dr. Gurmit Singh** has participated in several breast cancer awareness events where he has spoken with many breast cancer survivors.

In speaking with these women, Dr. Singh says he came to realize that "extended life is not necessarily what they are after. What they want is quality of life." For many patients with advanced breast cancer, this means relief from the pain associated with bone metastasis – the spreading of cancerous cells to the bone.

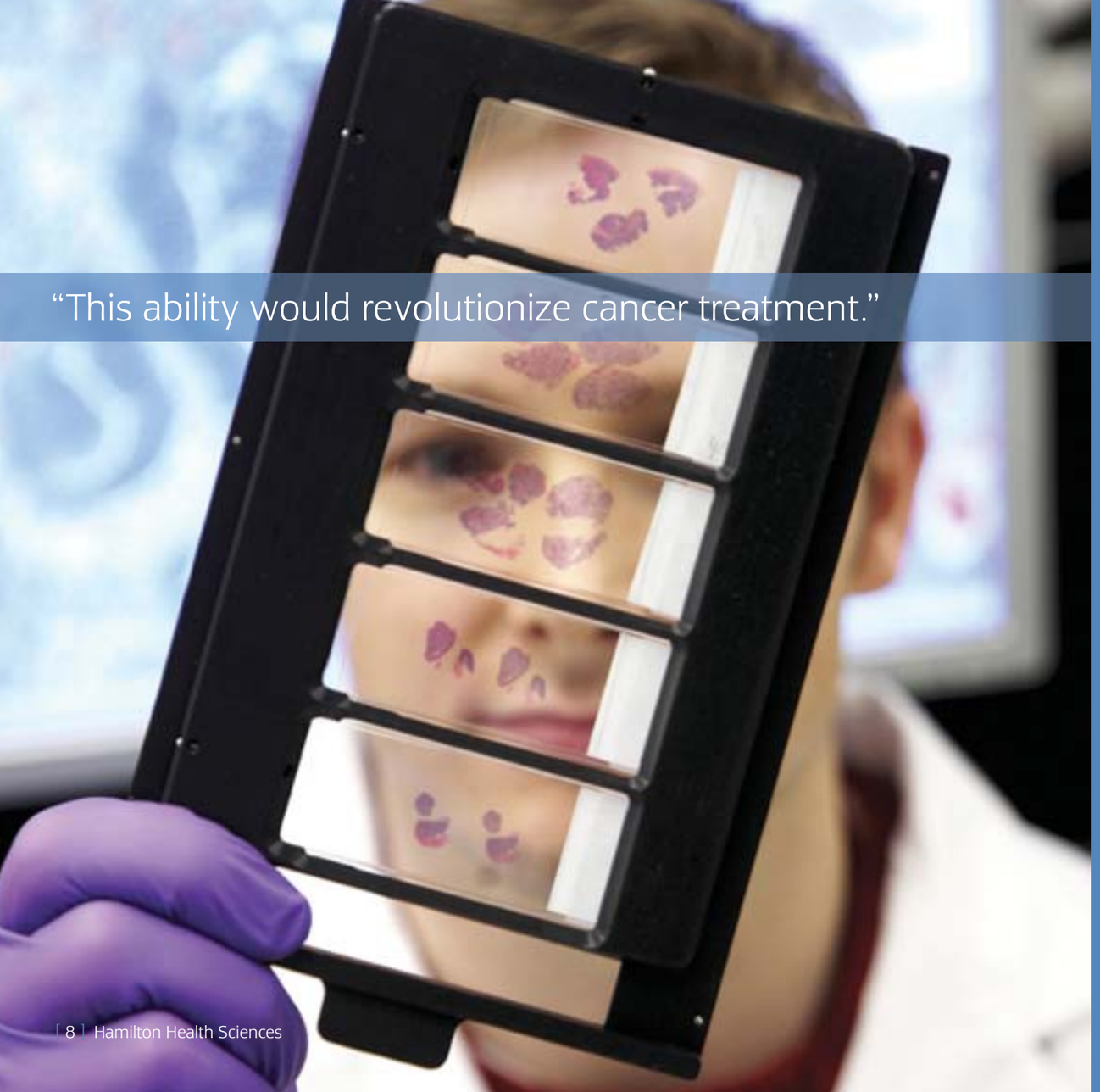
One of Dr. Singh's most significant advancements has been the development of a unique optical imaging system that makes tumor cells appear florescent. This highly advanced technology allows researchers to observe the real-time movement and progression of these cells throughout the body of a living animal.

Using a mouse model, Dr Singh's research group has discovered that tumor cells release a neurotransmitter called glutamate. This neurotransmitter may be the culprit in initiating cancer-associated pain. His group is now developing novel drugs that they hope will halt pain at the cancer site.

"My research may not help just breast cancer patients. It could be very useful for all kinds of pain," Dr. Singh says.

However, Dr. Singh emphasizes that there is still much work to be done. He is truly excited about the collaborative culture of health sciences and the international co-operation that he has been able to establish.

"I think my greatest discovery is yet to come."



“This ability would revolutionize cancer treatment.”

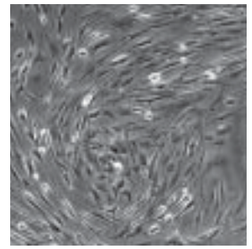
Stem cells are stubborn roots of cancer

The fact that so little is known about the reoccurrence of treated cancers does not discourage senior scientist **Dr. Mickie Bhatia**. Instead, it is this unfortunate reality that drives him and his team in their search for a better understanding of stem cells and how they relate to the reoccurrence of cancer.

Dr. Bhatia and his research team are interested in the potential ability to distinguish cancerous stem cells from normal ones. The current thinking, Dr. Bhatia explains, is that cancer often reappears after treatment because cancer cells with stem cell-like qualities are actually resistant to therapies such as chemotherapy. Even when treatment is successful in shrinking the tumor, some cancerous stem cells may be left behind, allowing the tumor to re-grow and/or metastasize.

In order to prevent this re-growth, researchers will need to develop bioactive compounds to selectively kill cancer stem cells without harming normal ones. So far, Dr. Bhatia and his team have developed 12 criteria to distinguish cancerous stem cells from normal stem cells using a novel in vitro model.

“These criteria,” Dr. Bhatia says, “bring us one step closer to being able to understand the difference between normal stem cells versus cancer stem cells towards the goal of preferentially eliminating cancerous stem cells. This ability would revolutionize cancer treatment.”



far left: A member of Dr. Bhatia’s research team inspects stem cells in the lab. **top and middle left:** Researchers use pipetting tools to transfer samples. **bottom left:** Fibroblasts, the cells that serve as the support structures for tissues and organs, are often used for stem cell research. **right:** Dr. Bhatia, shown here, has already established an international name for himself in the cancer field with his groundbreaking stem cell research.

Breaking down the borders of heart disease

Heart disease and stroke are not limited to international borders, so neither is **Dr. Salim Yusuf’s** research. For more than 30 years, he has been dedicated to understanding and improving global cardiovascular health.

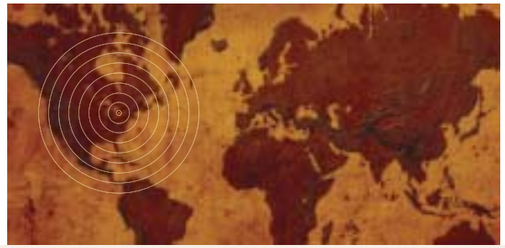
Earlier this year, Dr. Yusuf, along with Dr. Martin O’Donnell, completed the first phase of the INTERSTROKE study which investigated causes of stroke in 6,000 ethnically diverse patients from 22 countries. Most of these countries were located in undeveloped parts of the world such as South-East Asia, India and Africa, where strokes are most prevalent but least understood. In 2004, Dr. Yusuf completed a similar study, called INTERHEART, on the causes of heart disease in 52 countries involving more than 28,000 people.

“Over 80 per cent of heart disease and strokes occur in developing countries,” Dr. Yusuf says. “But less than 10 per cent of heart disease or stroke research is done in these settings.”

As a result of these studies, researchers identified 10 risk factors associated with 90 per cent of strokes and heart attacks: high blood pressure, cigarette smoking, abdominal obesity, poor diet, lack of physical activity, lipids, diabetes, excessive alcohol intake, stress and depression, and heart disorders. Dr. Yusuf feels that by controlling these factors – especially avoiding smoking and controlling high blood pressure and cholesterol – the global burden of strokes and heart attack could be reduced substantially.

“If you know the health behaviors that increase the risk of stroke and heart attacks, you can avoid those behaviors early in life,” Dr. Yusuf explains.

Now, Dr. Yusuf and his colleagues have begun the second phase of INTERSTROKE. This part of the study, which aims to involve 20,000 international patients, will attempt to determine the individual risk factors that are most strongly associated with different geographic areas and ethnic groups.



far left: World renowned cardiovascular researcher, Dr. Salim Yusuf, stands in the David Braley Cardiac, Vascular and Stroke Research Institute. This state-of-the-art building houses the Population Health Research Institute (PHRI), led by Dr. Yusuf, and the Thrombosis and Atherosclerosis Research Institute (TaARI), led by Dr. Jeffrey Weitz. **top:** Cardiovascular research at Hamilton Health Sciences has a global focus. **bottom:** The David Braley Cardiac, Vascular & Stroke Research Institute has 200,000 square feet of research space, laboratories, meeting rooms, offices and breakout spaces.

Findings give new life to diabetes research

Type 2 diabetes affects more than 10 per cent of Canadian adults. It is a leading cause of heart attack, stroke and death. These facts are difficult to ignore. Especially for endocrinologist, **Dr. Hertzel Gerstein**.

For the past few years, Dr. Gerstein and his team at PHRI have been conducting several cardiovascular prevention trials in patients with type 2 diabetes. For example, the recently completed ACCORD trial showed that targeting perfectly normal blood sugar levels and perfectly normal blood pressure levels does not necessarily prevent cardiovascular events over a three-to four-year period.

"The major impact is that this will reduce the burden of taking multiple types of medications for people with type 2 diabetes," Dr. Gerstein says. "It also tells us that continuing to push the dose and number of currently available glucose medications in people who do not respond to therapy is not a useful strategy."

Still ongoing are global trials of insulin, omega 3 fatty acids, vitamin D and thiazoldinedione drugs as possible strategies to reduce outcomes like cardiovascular disease, strokes, decreased brain function, and even cancers.

"Anything that can be done to reduce the burden of diabetes for patients will be a huge benefit to them and their families. The best thing about our work is that we have the privilege of discovering those very things that could potentially make a difference for millions of people around the world."

top left: An elderly woman monitors her blood pressure. Although this practice remains important to patients with diabetes, Dr. Gerstein's new research has shown that it does not necessarily prevent cardiac events **top right:** A doctor checks a bag of blood. Dr. Eikelboom's latest research (next page) on the shelf life of pretransfusion blood may push hospitals to be more resourceful with their supplies. **bottom:** In his office, Dr. Gerstein speaks with a diabetic patient. Working face-to-face with patients, he says, reminds him of why his research is so important.

New blood could bring new beginnings

According to **Dr. John Eikelboom**, internal medicine and hematology, we may need to reconsider the shelf life of blood. It could be much shorter than previously thought, and that may mean hospitals should handle their blood supplies differently.

In early 2010, Dr. Eikelboom and Nancy Heddle, Head of the Transfusion Research Program at McMaster University, completed a preliminary study of how the duration of storage of blood affects the outcomes of cardiovascular patients at Hamilton Health Sciences who receive a red cell transfusion. What they found was that the longer the blood has been stored, the greater the risk of in-hospital mortality.

As red blood cells age, Dr. Eikelboom explains, they undergo a series of progressive changes that might make them less efficient at delivering oxygen to the tissues.

"If confirmed in our studies that are currently ongoing, these findings could substantially influence how we manage our inventory of blood," Dr. Eikelboom says.

For example, hospitals may begin to take more strategic approaches like transporting blood between sites so fresh blood does not sit unused in a refrigerator in one location when it could be used at another location.

"This will mean fewer cases of heart attacks and fewer deaths," Dr. Eikelboom says. "At the end of the day, that is what this research is all about."

PCI patients get a double-dose of good health

When heart patients undergo a procedure called percutaneous coronary intervention (PCI) to clear blocked arteries, they run the risk of experiencing serious complications such as heart attacks, strokes and blood clots. In order to prevent these complications, patients are typically given aspirin and a blood-thinning drug called clopidogrel.

However, until now, doctors had not established the most effective dosage – too little could cause a blood clot, while too much could cause excessive bleeding (for example, after a bruise, cut, nose bleed, or in the urinary or gastrointestinal tracts.)

Last year, interventional cardiologist, **Dr. Shamir Mehta**, and his colleagues completed a study called CURRENT-OASIS 7, which compared various drug doses to prevent heart complications in patients undergoing PCI. What they found was that a double-dose of clopidogrel taken for seven days, compared to the standard dose, reduced patients' risk of heart attack by 22 per cent and the risk of a blood clot by 30 per cent. The study also compared a high dose of aspirin with a low dose and found similar outcomes.

"What this implies is that the combination of high-dose clopidogrel with usual doses of aspirin may be the optimal treatment strategy in PCI patients," Dr. Mehta says.

The CURRENT-OASIS 7 study was conducted in 597 centers in 39 countries. As Dr. Mehta explains, these findings will not only impact the practices of other interventional cardiologists, but it may save the lives of heart patients worldwide.

top: Doctors perform cardiac surgery. In cardiac surgery where a cardiopulmonary bypass is used, Dr. Whitlock's study revealed that a low-dose of steroids improved outcomes and reduced complications. **bottom left:** Dr. Whitlock's research could have life-saving potential for patients like Gary Oliphant, shown here, who underwent bypass surgery several years ago. **bottom right:** Dr. Whitlock.

Taking cardiac surgery outcomes to heart

Every year, two million people around the world undergo cardiac surgery involving the use of a cardiopulmonary bypass. This is when a machine is used during open heart procedures to pump and oxygenate the patient's blood. Unfortunately, some of these patients experience inflammation which can cause serious complications such as thrombosis (blood clots), heart attacks, bleeding and organ failure.

It has been well known for some time that high doses of steroids can effectively reduce this inflammation; however, they can have serious side effects. For the past few years, cardiac surgeon **Dr. Richard Whitlock** has been conducting a series of trials to determine the optimal steroid dose to suppress inflammation after bypass operations – low enough to avoid side effects but high enough to be effective.

His current study is showing early promise. So far, those who have received a low dose of the steroid drug have experienced better outcomes and fewer complications. These findings suggest that a low steroid dose may reduce the inflammation associated with the use of a cardiopulmonary bypass, without the side effects of a high steroid dose.

Dr. Whitlock places a high priority on global partnerships and hopes to expand this trial to involve more than 50 international centres.

"This research will be very beneficial to cardiac surgery patients globally," Dr. Whitlock says. "Further, working with developing countries within this research will build capacity to study and improve outcomes in their populations."

New bypass method could change surgery in a heartbeat

Coronary heart disease, the building up of plaque within the arteries, is the most common form of heart disease and a major cause of death in Canada. Every year, more than 200,000 coronary artery bypass surgeries are performed across North America in order to treat this disease.

Currently, this surgery is done on-pump, where the heart is stopped and a cardiopulmonary bypass machine is used to keep blood and oxygen moving throughout the body. Although effective, on-pump bypass surgery can cause heart attacks, strokes and kidney failure in up to seven per cent of patients. It can also cause neuro-cognitive dysfunction and atrial fibrillation in up to 40 per cent of patients.

In hopes of preventing these complications, researchers have recently developed a unique method of off-pump bypass surgery where the heart continues beating throughout the operation.

Cardiologist **Dr. André Lamy's** latest study compares these two methods in order to find out which one is best. Although the study's results will not be final until the end of summer 2011, Dr. Lamy has high hopes for the innovative off-pump technique.

"If this off-pump method is proven to be better it will change the way cardiac surgery is done worldwide," Dr. Lamy says. "This would mean no longer needing to use a heart and lung machine for bypass surgeries, therefore decreasing complications."

top: Dr. André Lamy, shown here, conducts coronary artery bypass graft surgery on a patient. Dr. Lamy's latest research will have a huge impact on how these surgeries are conducted throughout the world. **bottom:** Cardiac surgeons at Hamilton Health Sciences.

Surgery the ultimate stress test for heart

Modern surgeries – whether removing a tumor or transplanting a hip – can be incredible, life-saving procedures. However, they can also be extremely stressful and even cause serious complications such as heart attack, stroke and death.

"Surgery is the ultimate stress test and we need to find ways of making it safer," says cardiologist **Dr. P. J. Devereaux**.

In 2008, Dr. Devereaux and his colleagues published a study that found that two out of three patients who experienced complications after a non-cardiac operation did not show any symptoms. If patients are not monitored in some way, Dr. Devereaux says, these complications can be easy to miss.

The solution, he suggests, may lie in an inexpensive, simple blood test called a troponin test. Troponin is a muscle protein that, although normally low, increases drastically within several hours of a heart attack. By measuring the levels of troponin in a patient's blood, doctors can better determine whether or not the patient is having or has had a heart attack.

Given all of the great things that surgery can do for critically ill patients, Dr. Devereaux and his colleagues hope to be able to better predict and eventually prevent heart complications from happening.

"We are trying to make surgery safer so that people can enjoy its many benefits."

top left: Doctors perform surgery. **top right:** A heart monitor. **bottom:** Dr. Devereaux is researching a test that may enable physicians to manage cardiac complications experienced by surgical patients.

above: In the Electrophysiology Lab, Dr. Stuart Connolly oversees a procedure. Dr. Connolly's latest findings could provide alternative medication for atrial fibrillation patients who are unable to take warfarin.

Opening up new options for atrial fibrillation patients

For the majority of patients with atrial fibrillation – a condition characterized by a fast and irregular heartbeat – a blood-thinning drug called warfarin provides adequate treatment. However, for some patients, an alterative is needed.

Recently, cardiologist **Dr. Stuart Connolly** completed the RELY study, which compared warfarin with a new blood thinner called Dabigatran in a randomized clinical trial of more than 18,000 patients. Findings showed that two doses of Dabigatran was more effective than warfarin in preventing strokes. Dabigatran was also found to be safer and much easier to use. As a result of these findings, Dabigatran will now become an important new therapy for the prevention of stroke in patients with atrial fibrillation.

"These results are definitely going to change practices," Dr. Connolly says. "It will really improve clinical outcomes for patients with atrial fibrillation."

Dr. Connolly's research will have profound implications for people suffering from atrial fibrillation – especially those unable to take warfarin. At a time when these patients feel that they are out of options, new research findings bring new hope.

"I am very excited about the results of the RELY study," Dr. Connolly says. "Dabigatran is going to reduce strokes in our patients."

Taking atherosclerosis research step by step

Sometimes, to best understand a disease you need to go back to the very beginning. This is exactly what **Dr. Jeffrey Weitz** has been doing in order to better understand the formation of atherosclerosis - the buildup of fatty deposits along the walls of the arteries.

"We are really trying to hone in on the steps involved in the development of atherosclerosis," Dr. Weitz explains. "If we could identify some unifying pathways, we could prevent atherosclerosis before it even happens."

In particular, Dr. Weitz and his team have been looking at the steps involved with clot formation. According to Dr. Weitz, atherosclerosis on its own is not what kills patients. Although the fatty build-up of plaque can narrow the arteries, most heart attacks and strokes occur when soft plaques lining the artery walls spontaneously rupture. This triggers the formation of a blood clot – a thickened mass of blood that closes off the artery and blocks the flow of blood to the heart or the brain.

Now, Dr. Weitz and his research team are investigating some of the factors that determine clot formation in hopes of preventing them from forming. One approach, Dr. Weitz explains, would be to change the physical make-up of the plaque so that it does not rupture in the first place.

"If we can understand the pathways for atherosclerosis formation and potentially modulate the composition of the plaque, we could make a big impact on one of the major causes of death and disability in Canada and worldwide."

Forging a new pathway for diabetes research

Four out of five diabetics die of a cardiovascular event such as a heart attack or stroke. Yet, despite these staggering numbers, little is known about why this occurs.

Recently, **Dr. Geoff Werstuck** and his lab team have identified a unique pathway linking hyperglycemia – the increased blood sugar levels associated with diabetes – to the development of atherosclerosis. Atherosclerosis is the buildup of fatty deposits along the walls of the arteries and is the underlying cause of cardiovascular disease. This discovery brings researchers one step closer to bridging the gap between diabetes and the occurrence of heart attacks and strokes.

"Identifying this pathway could lead to the discovery of new and improved treatments and therapies for cardiovascular disease," Dr. Werstuck says. His laboratory is currently testing new compounds that may be developed into effective drugs to slow or prevent hyperglycemia from progressing.

"It is important to understand the disease mechanism in order to develop the best treatments," says Dr. Werstuck. "Our lab has made significant progress and our findings could positively impact the lives of the thousands of Canadians with diabetes and heart disease."

Thrombosis & Atherosclerosis

far left: Dr. Jeffrey Weitz, Director of the Thrombosis and Atherosclerosis Research Institute. **top:** An illustration shows the build-up of plaque along the walls of an artery. **above left:** A researcher works in Dr. Werstuck's lab. **middle right:** Dr. Werstuck has made significant advances in the treatment of cardiovascular disease. **bottom right:** A diabetic patient measures his blood sugar. Dr. Werstuck has recently identified a link between high blood sugar and the development of atherosclerosis in patients with diabetes.

> “We need to have a common way of talking about the functions and capabilities of the people we are treating.”
>
> **Dr. Peter Rosenbaum**

Rewriting the language of childhood disabilities

Feelings of confusion and uncertainty are all too familiar for the parents of children with disabilities. Unfortunately, when practitioners use poorly defined phrases like “mild” and “high functioning” to describe the child’s condition, they are only contributing to this sense of uncertainty. This, however, is where developmental pediatrician, **Dr. Peter Rosenbaum**, and the *CanChild* Centre for Childhood Disabilities come in.

For years, the words “mild,” “moderate” and “severe” were used by practitioners to describe a child’s level of cerebral palsy – a problem in the development of motor control. These words came with little explanation and told parents virtually nothing.

However, in 1996, Dr. Rosenbaum and his *CanChild* colleagues created a five-level classification system that not only gives a detailed description of the child’s function but can accurately predict how the child should progress, answering questions like, “Will my child walk?” This system is now used all over the world in over 25 languages.

“The classification system that we created gives parents a clearer outlook on mobility,” Dr. Rosenbaum says, “allowing them to prepare for the challenges ahead and develop realistic expectations about what their child will achieve.”

Following the immense success of the cerebral palsy model, Dr. Rosenbaum and *CanChild* have begun creating a similar system for autism. With so many children being identified with this neurodevelopmental disorder, expecting parents to rely on the phrases “high-functioning” and “low-functioning” in order to understand their child’s condition is simply unrealistic.

“Just as we needed a common way of talking about the functions and capabilities of children with cerebral palsy, we need a common way of talking about the abilities of children with autism,” Dr. Rosenbaum explains. “Simplifying how we communicate with the parents of children with complicated lives could have life-changing potential.”

Mothers & Children

far left: Dr. Rosenbaum plays with Audrina and Bridget Kumbera, twin sisters who were born prematurely.
above: Mothers and children have all benefited greatly from research conducted by the CanChild Centre. Dr. Rosenbaum’s latest research is dedicated not only to improving the lives of children with autism, but to improving the lives of these children’s parents as well.

Helping families PreVAiL through difficulties

"Our research centre is all about bringing people together in order to identify and bridge research gaps in preventing violence across the lifespan," says **Dr. Harriet MacMillan**.

Last year, Dr. MacMillan and her colleagues began an international research collaboration called the Centre for Research Development in Gender, Mental Health and Violence Across the Lifespan (PreVAiL). The aim, she says, is to reduce child maltreatment, partner violence and related mental health problems by developing interventions.

One of PreVAiL's recent collaborations is with the Prevention Research Center for Family and Child Health in Denver, Colorado, which developed the US-based Nurse-Family Partnership (NFP) program. Through this program, nurses visit the homes of first-time mothers throughout pregnancy and up until the child's second birthday. This unique program has seen great success in lessening child maltreatment. However, nurses say, when partner violence does remain in the home, it is much more difficult to reduce child maltreatment.

As Dr. MacMillan explains, these observations confirm the believed link between intimate partner violence and child maltreatment. Now, PreVAiL researchers are working to develop a partner violence intervention program for these nurses to use in hopes of preventing both intimate partner violence and child maltreatment.

"Seeing children day after day who have been abused and neglected strongly emphasizes to me the need for prevention in these areas," Dr. MacMillan says.

bottom left: Dr. MacMillan is co-founder of PreVAiL and principal investigator of the Nurse Family Partnership which seeks to prevent child maltreatment by implementing partner violence interventions. **top and bottom right:** School is very challenging for some children. According to Dr. Boyle's latest study (next page), children living in disadvantaged environments tend to complete fewer years of school than those from wealthier families and communities.

School not as easy as ABC for disadvantaged kids

For many disadvantaged and underprivileged children, affluence and community upbringing have a greater impact on success in school than tests and homework.

In 2001, **Dr. Michael Boyle** completed a long-term study on the relationship between a child's socioeconomic environment and their years of schooling. In 1983, researchers assessed the family and neighbourhood characteristics of 2,355 Ontario children between the ages of four and 16, and contacted them 18 years later to see how far they went in school.

The results, published in 2007, confirmed what has long been suspected – children from wealthier families in more affluent neighbourhoods went much farther in school. In contrast, children living in poorer environments such as rented housing, or families led by a teen mom, left school much earlier. In fact, every $1,000 decrease in family income was associated with 0.39 fewer years of education.

Such blatant disparity in the levels of achievement among these children not only proves the importance of examining family-neighbourhood influences, but also suggests the need for increased services and resources in economically underprivileged communities.

"If we can improve the opportunities available to children in disadvantaged environments, we can improve their capability and quality of life," Dr. Boyle says.

Currently, Dr. Boyle is co-principal investigator of a study examining the effects of family, neighbourhood and daycare environments on a child's emotional well-being and social functioning. Many of the children participating in this study will be from disadvantaged families such as low-income and lone-parent families.

"The research that we have done focuses attention on the need to offset the disadvantages experienced by many children early in life."

Optimism about outcomes for children with autism

"I remember one child in particular who I diagnosed with autism," says psychiatrist, **Dr. Peter Szatmari**. "He should have had a poor outcome over the first three or four years but, instead, he made significant progress within the first six months. You wouldn't have been able to pick him out from any of the other kids in a nursery school."

"People tend to have a gloomy picture of the outcomes of autism in children," Dr. Szatmari says. However, one of his most recent studies has begun to prove this negative outlook wrong.

Dr. Szatmari's study, now in its fifth year, began by identifying and diagnosing autism in more than 400 Canadian children between two to four years of age. Dr. Szatmari and his research team then followed the development of these children with autism up until Grade 1, studying their progression and their transitions into school. What they have since discovered is a subgroup of children who have progressed remarkably well, regardless of what treatments they receive.

"What is it about this subgroup that allows them to do so well?" Dr. Szatmari asks. "This is what we are now trying to understand."

Although no two cases of autism are exactly the same, Dr. Szatmari and his colleagues hope to be able to identify different groupings of children with autism based on how they progress overtime. This will allow them to better identify some of the "ingredients" that go into treatment.

"It's not impossible for someone to recover from autism," Dr. Szatmari says. "I do believe that children with autism can live happy, productive lives."

Enlightening girls who "light up" about reproductive health

For most teenaged girls, reproductive health is not a priority. However, since young girls are currently the fastest growing group of regular smokers, **Dr. Warren Foster** thinks that perhaps it should be.

One of Dr. Foster's most recent studies investigated the effects of benzo[a]pyrene, a primary component of cigarette smoke, on ovarian function and the number of follicles in a woman's ovaries. A follicle is a collection of cells within the ovary that supports the egg – the female reproductive cell – during its development. In this study, female mice were exposed to two cigarettes daily, after which the number of follicles remaining in their ovaries were counted.

What Dr. Foster and his research team discovered was that exposure to cigarette smoke and benzo[a]pyrene caused a significant loss of follicles in the ovaries.

According to Dr. Foster, this research is particularly important given that 36.2 per cent of girls from southwestern Ontario between the ages of 15 and 19 reportedly smoke cigarettes. Smoking at this age is particularly harmful, Dr. Foster says, because this is when women are at their reproductive prime.

"These results suggests that young girls and women who smoke will have more difficulty becoming pregnant later in life and will experience an earlier onset of menopause," Dr. Foster explains.

Although they may not be thinking about having children just yet, Dr. Foster stresses that the choices these young girls make now will have a profound impact on the future of their families.

Mothers-to-be need new nicotine therapies

The decision to give up smoking is always a good one – especially for pregnant women. However, according to new research conducted by **Dr. Alison Holloway**, the nicotine replacements often used for smoking cessation may actually have some harmful effects of their own.

"Women are encouraged to quit smoking by taking cessation therapies but there is limited information available regarding the risks associated with those therapies," Dr. Holloway says.

She believes that one of the major risks of using nicotine replacements like patches and nasal sprays during pregnancy is the increased risk of the unborn child developing diabetes once they are older.

Recently, Dr. Holloway and her team of researchers have shown in animals that maternal nicotine use during pregnancy and lactation results in abnormal glucose levels in the offspring when they are older. This finding suggests that it may be the nicotine in cigarette smoke that can cause an increased risk of type 2 diabetes in children born to women who smoked during pregnancy.

The question now, Holloway explains, is trying to figure out exactly what nicotine does to make the fetus more susceptible to diabetes.

"Understanding how these drugs affect the baby will allow researchers to develop new smoking cessation therapies that can help women quit smoking and have fewer risks for their unborn children."

top: A new father holds his newborn baby. According to Dr. Dore, it is very important to educate new fathers, as well as mothers, on the period of crying. **bottom left:** Whether it is for the health of your reproductive system or for the health or your unborn baby, both Dr. Foster and Dr. Holloway stress the importance of females giving up smoking. **bottom right:** Suzy Pauletto, shown here holding her newborn baby, was one of the 800 Hamilton mothers to receive a video and booklet on shaken baby syndrome and the period of crying.

Calming down baby means calming parents first

For many parents and caregivers, the endless and unexplainable wailing of a newborn child can feel like it will never end. This frustration and helplessness is often what brings new parents to shake their babies.

"Most people just don't know how harmful this is," says advanced practice nurse, **Dr. Sharon Dore**. "It is something that they do impulsively without thinking."

According to Dr. Dore, many new parents experience a period of a few months during which their baby can cry for hours a day, despite any attempts at soothing.

Recently, Dr. Dore and her colleagues initiated a unique parent-education program to provide 800 new mothers in the Hamilton area with a video and booklet package about this period of crying. The hope, Dr. Dore explains, is that this information will help prevent shaken baby syndrome.

First, the information package provides parents with a few techniques to comfort and soothe their crying baby – whether giving the baby a warm bath or singing him or her a lullaby. However, the program stresses that sometimes there is simply nothing you can do to pacify a crying baby. The best thing to do in this case, the program says, is to leave the baby in a safe place and walk away to collect yourself.

Dr. Dore hopes that this program will eventually become self-sustainable through the financial support of other community organizations and charitable groups. This would allow mothers outside the Hamilton area to benefit from the program

"I would have been more comforted had I known that you may not be able to calm the baby down," says Karen Coleman, a mother interviewed during the video. "It's just normal."

Heart attacks more to do with culture than genes

After 10 years of searching for the genetic factors that cause heart attacks, epidemiologist **Dr. Sonia Anand** has found them. However, the results have come as a surprise to her and her colleagues.

For six years, Dr. Anand and her colleagues analyzed approximately 20,000 blood samples from a large, global study called INTERHEART in order to understand how the genetic makeup of different ethnic groups influences heart disease. In their first study of 100 genes, they found that genetics increased the risk of heart attack by just 1.6 per cent – an amount much less than previously believed.

As Dr. Anand explains, this actually came as very good news. These findings mean that heart attacks have less to do with your genetic heritage, which you cannot control, and more to do with your behavior and lifestyle, which you can control. This means that heart attacks may be much easier to prevent than previously thought. It also helps explain why some ethnic groups appear more prone to heart attacks than others.

"Ethnicity is not just in the genes," Dr. Anand always says. Many cultural factors such as food, way of life and the commonality of smoking and exercising can have an enormous impact on a person's risk of heart attack.

Dr. Anand is now beginning to study how genetics interact with environmental factors to affect heart disease. By learning more about these risks, Dr. Anand and her colleagues are bringing us one step closer to preventing heart attacks.

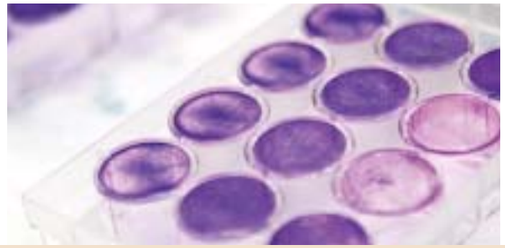
Getting right down to the genes with stroke research

According to genetic epidemiologist, **Dr. Guillaume Pare**, genetic factors clearly contribute to stroke risk, yet exactly which genes remains largely unknown.

Now, using the latest in genetics technology, Dr. Pare has begun to analyze blood samples from a large, international study of stroke patients to determine the genetic differences between those who have been affected by a stroke and those who have not. Dr. Pare believes that this will help researchers identify specifically which genes are responsible for causing strokes.

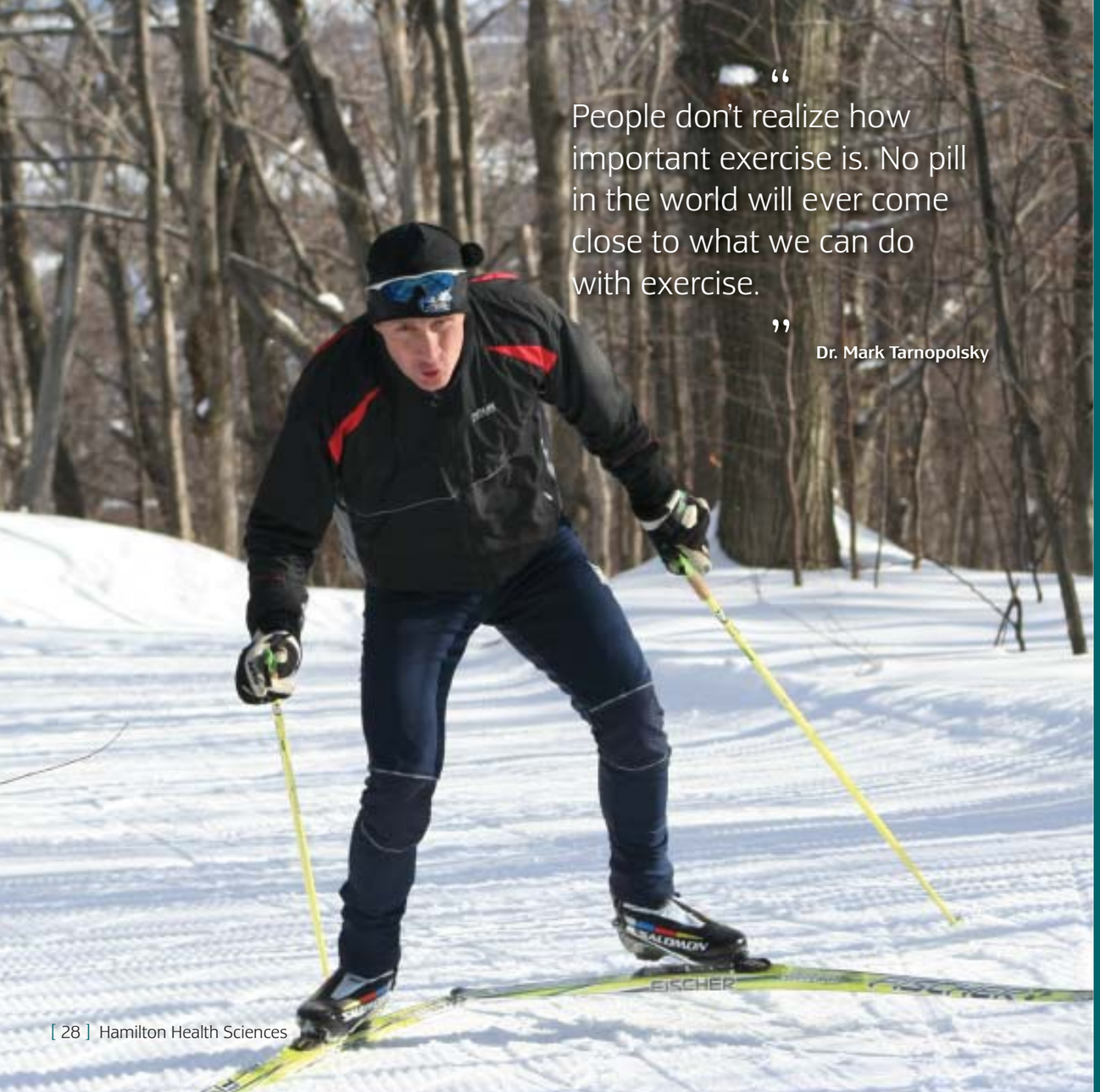
As Dr. Pare explains, determining which genes cause strokes would have profound implications on stroke prediction, prevention and, eventually, treatment.

"Genetics is all about personalized medicine," Dr. Pare says. "We want to improve people's lives by better predicting who will have a stroke and better personalizing their treatment. There is still much work to do in terms of tailoring treatment based on the genetic make-up of individuals, but we are making steady progress in that direction."



Genetics

far left: Dr. Anand, shown here, feels that non-Caucasian people are vastly under-represented in epidemiological research. With her latest study, she hopes to change that. **middle left:** Reina Hassell, Dr. Pare's research technologist, shows how to insert samples into the advanced machine. **bottom left:** A genetics researcher handles a box of samples in the lab. **right:** Dr. Pare stands next to the QIAsymphony, the high-tech machine that researchers use to extract DNA from the blood samples. This, he hopes, will allow him to determine the genetic differences between those who have suffered a stroke and those have not.



> People don't realize how important exercise is. No pill in the world will ever come close to what we can do with exercise.
>
> **Dr. Mark Tarnopolsky**

Turning the clock back on muscle aging

Neurometabolic specialist **Dr. Mark Tarnopolsky's** research on mitochondria – the "power plant" compartment of a cell – and how its malfunction relates to aging and mitochondrial disease is more than just a matter of grey hair and wrinkles. His research could be very powerful in relieving the burden of society's aging population.

In a recent study, lab mice bred with mitochondria malfunctions to accelerate aging were set to run on a treadmill for half an hour, three times a week, for five months. Another group of mice with the same genetic defect did nothing. What researchers found was that the mice that received endurance training were completely protected from premature aging in all tissues of the body.

Another one of Dr. Tarnopolsky's studies, this time involving elderly people, has yielded equally astounding results. Researchers found that when elderly people participated in weight training, oxidative stress was reduced and mitochondria function was enhanced in the muscle by activating a muscle stem cell called a satellite cell; thereby partially reversing the effects of aging. In fact, researchers have found that four to six months of weight training in people over the age of 65 can reverse muscle aging by about 20 years.

"If we can encourage people to exercise, we can keep them out of nursing homes," Dr. Tarnopolsky says. "This will also mean fewer seniors having to receive heart bypasses and joint replacements – both of which put a strain on the health care system and the economy."

"But what a difference it would make if we could start encouraging physical activity when people are young," Dr. Tarnopolsky continues.

A huge advocate of kids' sports, Dr. Tarnopolsky, along with fellow McMaster professor Dr. Mike Waddington, has formed Adventure Running Kids. The program allows kids between the ages of eight and 16 to learn orienteering and adventure running.

Body Matters

far left: Dr. Tarnopolsky doesn't just endorse a healthy lifestyle – he leads one. Here he is seen enjoying one of his favorite activities, cross-country skiing. **top:** Young girls play soccer. According to Dr. Tarnopolsky, being physically active as a child can encourage a healthy lifestyle later in life. **middle left:** According to Dr. Tarnopolsky's latest research, weight training in people over the age of 65 can reverse muscle aging by about 20 years. **bottom left:** Even adults under the age of 65 can prevent muscle aging by lifting weights. **right:** A boy jumps to spike the ball during a volleyball game. It is important to maintain an active lifestyle through the teenage years.

top: Dr. Arthur's latest findings will allow female cardiac patients to return to many of the activities that they previously enjoyed, such as gardening. **bottom left:** Audrey Gunson, a patient at Hamilton General Hospital's Cardiac Health and Rehabilitation Centre, says she much prefers lifting weights to aerobic exercises. She says she enjoys coming to the hospital's gym where using the weight machines is a unique, enjoyable experience for her and other cardiac patients. **bottom right:** Dr. Arthur is dedicated to researching women and heart disease.

Weight lifting gives cardiac patients newfound strength

To scientist **Dr. Heather Arthur**, "quality of life" is more than just a medical term. Improving quality of life for cardiac patients is the very thread that binds her research.

One of Dr. Arthur's most recent studies looked at why female cardiac patients have such difficulty keeping up with their aerobic rehabilitation programs. The study, comprised entirely of women recovering from cardiac surgery, found that female patients much preferred strength training to aerobics. Furthermore, results showed that aerobic training alone was not nearly as effective as combined aerobic-strength training. This combination training made participants more self-sufficient in stair climbing, lifting and walking.

"The implications of this are that patients' risk for cardiac events will be reduced if they do both aerobic and strength training," says Dr. Arthur. "On top of that, there will be a huge improvement in their quality of life and independence."

Everyday activities like carrying things up stairs and managing heavy work, both in and outside of the home, can often be too taxing on patients' recovering hearts. For women, a balanced fitness regime could allow them to return to work or other activities more quickly, Dr. Arthur explains.

"We want people to be able to live the way they used to live."

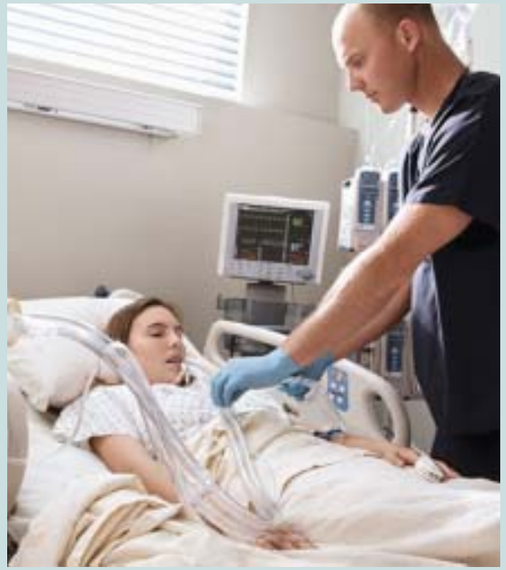
Findings breathe life into patients' chances

Although breathing machines can be life-saving instruments, they can also cause damage to the already injured lungs of patients with acute respiratory problems.

Dr. Maureen Meade and her colleagues recently embarked on a trial to improve respiratory life support for patients with acute respiratory distress syndrome. This study will look at high frequency oscillation, a unique ventilation method characterized by a higher number of breaths per minute and smaller breath volumes. This ventilation method is expected to better protect acutely injured lungs from further damage.

"It's different, it's new, it's exciting," Dr. Meade says. For researchers and doctors, high frequency oscillation is a promising medical prospect. For patients, it is a matter of life or death.

"These patients are among the sickest of the sick in intensive care units. For them, there is about a 50 per cent chance of mortality," Dr. Meade says. "We know that the way we use the ventilator influences whether they live or die."



top: A critically ill patient is able to breathe more easily with the assistance of a high frequency oscillator. **bottom left:** Dr. Meade believes that this method of ventilation should reduce damage to patients' lungs. She is dedicated to patient-focused research in the intensive care unit. Her research has greatly influenced evidence-based decision-making in critical care. **bottom right:** Breathing machines, such as the one being used here by a patient, are essential to many critically-ill patients.

Irritable bowel syndrome treatments go back to basics

Given that an estimated 13 to 20 per cent of Canadians suffer from irritable bowel syndrome (IBS), it is no surprise that gastroenterologist **Dr. Paul Moayyedi**, has dedicated some of his most recent research to better understanding possible treatments.

Irritable bowel syndrome (IBS) is a gastrointestinal disorder characterized by abdominal pain, bloating, constipation, and/or diarrhea. In 2008, Dr. Moayyedi conducted a review of evidence for treatments of IBS for the American College of Gastroenterology. Traditional treatments such as fibre, antispasmodics – drugs used to relieve muscle spasm – and peppermint oil were thought to be ineffective in treating IBS but, after careful analysis, Dr Moayyedi and his team found that these treatments do in fact ease symptoms in patients with IBS. Dr. Moayyedi's review also found that probiotics were very effective in treating IBS as were antidepressants. This was the first comprehensive analysis to show that these treatments were useful.

Although IBS remedies like these have been gaining popularity over recent years, Dr. Moayyedi's research lends valuable credibility to these prospective treatments which could be used by millions of patients.

"McMaster is famous for giving the world Evidence – Based Medicine and this is another example of how this can help patients," says Dr. Moayyedi.

Dr. Moayyedi's work is complemented by work being carried out in the Farncombe Family Digestive Health Research Institute by Drs. Premysl Bercik, Elena Verdu, Michael Surette and Stephen Collins. This team is evaluating how probiotic bacteria influence gastrointestinal function and is attempting to identify the underlying molecular mechanisms. This is important as each probiotic bacterium is different in terms of its ability to influence the host. This and other research by this team will help to further advance probiotic therapy.

top: Probiotic bacteria is said to have beneficial effects for patients with irritable bowel syndrome. Probiotics have gained recent attention with the growing popularity of probiotic-enriched foods like yogurt, milk and cheese. **bottom left:** According to Dr. Moayyedi's latest research, peppermint oil, derived from the plant shown here, can effectively treat irritable bowel syndrome. **bottom right:** Dr. Mark Loeb, shown here, is studying the concept of "herd immunization" in Hutterite colonies (next page).

Herd immunization is more than worth a shot

In 49 remote Hutterite colonies across western Canada, researchers believe they have found the solution to influenza, otherwise known as the flu. However, this solution does not come in the form of a miracle treatment or even a new vaccine.

The solution, says infectious disease specialist **Dr. Mark Loeb**, lies in "herd immunization." This occurs when an entire community is protected from a disease simply by immunizing a small, select group such as children.

In 2008, Dr. Loeb and his colleagues gave flu shots to Hutterite children between the ages of 3 and 15. What researchers found was that although they immunized only children, doing so resulted in far fewer adults catching the virus. In fact, there was a 60 per cent "protective effect" for the rest of the colony.

"It's really quite amazing," Dr. Loeb says. "You immunize kids and it's like giving a shot to an adult. This is some of the best evidence for why children should be selectively immunized against the flu."

However, the concept of "herd immunization" is not limited to secluded Hutterite colonies. In fact, Dr. Loeb believes that his findings should be applicable to suburban towns as well. This, Dr. Loeb explains, could lead to school-based vaccination programs that could, in turn, protect entire communities.

Whether this means keeping a young child from missing school or saving the life of a high-risk elderly person, stopping the spread of the flu would have a profound impact on people's day-to-day lives.

Researchers learn from Walkerton tragedy

Sometimes, in science, there is much to learn from tragedy. This was the case in May 2000, when the water supply of Walkerton, Ontario became contaminated with bacterial species including E.coli and Campylobacter. After drinking the town's contaminated water, thousands of Walkerton residents developed gastroenteritis, an infection of the stomach and intestines. This health crisis generated headlines across the country. It also caught the attention of gastroenterologist, **Dr. John Marshall** and his colleagues at Hamilton Health Sciences.

Two years after the outbreak, 5,000 Walkerton residents attended a clinic set up by Dr. John Marshall and his colleagues. Participants returned every year for eight years to take part in a study on the long-term health outcomes of gastroenteritis – in particular, post-infectious irritable bowel syndrome (PI-IBS), a well-known complication of gastroenteritis.

Dr. Marshall's study found that 28 per cent of Walkerton residents affected by gastroenteritis went on to developed PI-IBS. Eight years later, this number dropped to 15 per cent. While findings showed the many PI-IBS patients did improve, others continued to experience symptoms such as abdominal pain, bloating and diarrhea or constipation for up to eight years.

The study also identified several factors that increased the risk of developing PI-IBS: female gender, younger age, prior anxiety/depression, high fever and weight loss. In the future, these findings will help identify high-risk individuals and even aid in the development of potential treatments.

"Walkerton was a very tragic event and we hope that nothing like it ever happens again," says Dr. Marshall. "However, it was a chance to learn a great deal about gastroenteritis and post-infectious irritable bowel syndrome."

top: Dr. Jack Gauldie, shown here, is studying a tuberculosis vaccine that forces the body to use its own natural immune system. **bottom:** A tuberculosis vaccine could have a profound impact on underdeveloped countries where the infection is rampant.

Tuberculosis vaccine shows promise in studies

Tuberculosis, a highly contagious infection of the lungs, is a serious disease that plagues underdeveloped countries throughout the world and even effects developed nations as well. However, according to **Dr. Jack Gauldie**, director of the Centre for Gene Therapeutics, a vaccine may be in sight.

Last year, gene therapeutics researchers began Canada's first clinical trial to test a tuberculosis vaccine on human subjects. Instead of using antibiotics, which many new tuberculosis strains have become resistant to, this new vaccine forces the body to use its own natural immune system. After administering the vaccine to 43 volunteer subjects, researchers are now analyzing blood samples to see whether or not the vaccine is triggering the desired immune response.

Although it will be two to three years before researchers can be certain that the vaccine is safe and effective, Dr. Gauldie and his colleagues expect great things. In an earlier study involving small animal subjects and another involving larger animals, the vaccine showed very promising protection.

If the vaccine proves to be as useful as Dr. Gauldie anticipates, this would have profound implications for underdeveloped countries where tuberculosis is rampant, as well as for developed countries where TB is expanding dangerously as a co-communicated disease with HIV.

"Vaccines are the most effective way to combat these wide-spread and devastating infections that affect both the third world and, increasingly, our own world," said Dr. Gauldie.

New therapies could help young tuberculosis patients

In Africa and India where Human Immunodeficiency Virus (HIV) has reached epidemic proportions, people, especially the young, are at risk for infections such as tuberculosis.

Pericardial tuberculosis is a serious form of tuberculosis that affects the membrane surrounding the heart. It results in serious complications or death for 50 per cent of people affected, despite the use of antituberculosis medication.

Researchers **Dr. Salim Yusuf**, **Bongani Mayosi**, and **Jackie Bosch** are involved in a study supported by the Population Health Research Institute that seeks to determine the impact of two different anti-inflammatories on this form of tuberculosis.

The study, called IMPI, is currently underway and is assessing the effectiveness of the two therapies in 1,400 patients from 42 centres in South Africa, Mozambique, Malawi, Nigeria, Zimbabwe, Uganda, Sierra Leone, Cameroon, Kenya and India.

The first therapy is corticosteroids, which reduce inflammation and therefore are believed to reduce the likelihood of further cardiac problems, and potentially death, in patients with pericardial tuberculosis.

The second therapy is Mycobacterium w, which reduces inflammation, but can also boost the immune systems of HIV patients, potentially helping them survive pericardial tuberculosis.

"Pericardial tuberculosis is a severe disease often resulting in mortality in the young," says Ms. Bosch. "If these therapies are proven effective, they could increase the chance of survival by 35 per cent."

top: Bongani Mayosi, an international fellow of the Population Health Research Institute, is one of the researchers studying new therapies for patients with pericardial tuberculosis. **bottom:** IMPI project leader Jackie Bosch (centre) with researchers Stephanie Hall (left) and Margaret Kuofie (right).

top: An x-ray of a fractured tibia. **bottom left:** In an operating room in Kenya, such as the one shown here, using soap would not only be a simpler cleaning option, but it would also be much cheaper. **bottom right:** Dr. Bhandari holds a bottle of soap used to clean open tibia fractures. Soap, he says, is a much simpler and less damaging alternative to the pulsatile lavages currently in use.

Keeping tibia fracture management simple

When cardiac surgeon **Dr. Mohit Bhandari** was a first-year resident working with an orthopedic surgeon 16 years ago, he witnessed the use of a pulsatile lavage – a tool that cleans wounds with pressurized fluid – to remove debris from an open tibia or shin fracture. The lavage, he says, appeared to be damaging the wound.

When Dr. Bhandari asked the surgeon he was working with why a simpler, cheaper and less damaging method could not be used, the surgeon replied, "Why would you waste your time with this question? We know this works." Unconvinced by this so-called expert opinion, Dr. Bhandari soon began researching better ways of treating tibia fractures.

"In life we are told to believe in experts, but experts are often wrong – especially when they ignore the evidence," he explains.

Dr. Bhandari and his team members have since launched FLOW, a trial of more than 2,200 patients that looks at simpler, cheaper ways of cleaning open fractures where the bone has broken through the skin. Soap, for instance, costs pennies compared to some of the methods currently in use – an option that could have profound implications for impoverished places like Africa. For rapidly urbanizing countries like China and India, where vehicle accidents continue to rise at an alarming rate, improving methods of cleaning trauma wounds would be invaluable.

"I think where we've really evolved in the last five years is finding simple solutions that can be applied on a global level," Dr. Bhandari says. "As is so often the case, the simplest solutions are usually the best."

The CHORD that bonds research and bedside

As incredible as it may seem, it often takes an entire generation – 17 to 20 years – for research findings to be routinely applied to patient care. Initially, when this delay was documented, it came as a shock to researchers like **Dr. Salim Yusuf**, Vice President of Research at Hamilton Health Sciences.

"We assumed that whatever we discovered would translate quickly into enhanced patient care but, what we found is that there is a large gap between the research and the bedside," Dr Yusuf explains.

Several years ago, Dr. Yusuf and some of his colleagues began to envision ways to help bridge this gap. Two years ago they developed CHORD, the Centre of Healthcare Optimization Research and Delivery, in order to fund knowledge translation initiatives that are aimed at improving bedside care.

In early 2010, CHORD competitively awarded $400,000 to three such projects proposed by health care and supportive teams at Hamilton Health Sciences.

One of the three grant-winning projects, led by one of HHS' Chiefs of Nursing Practice, Leslie Gillies, is called the Gentle Persuasive Approach. This initiative provides health care professionals with knowledge and skills to prevent and/or reduce agitation in patients with dementia or delirium. So far, the project has been implemented in the Orthopedic/Internal Medicine Unit at the Juravinski Hospital.

According to Dr. Yusuf, CHORD hopes to fund many more projects like this in the coming years. That will mean both patients and caregivers will benefit from the latest and greatest in medical research.

"Our biggest health advancements," Dr. Yusuf says, "will come from the things we already know."

top: Leslie Gilles, leader of the Gentle Persuasive Approach initiative, chats with Mabel Hergott, a patient of the Orthopedic/Internal Medicine Unit. Connecting one-on-one with patients is just one example of how dedicated the nurses of this unit are to delivering compassionate patient care. **bottom left:** Dr. Sandesh Shivananda received a CHORD grant for his project called Resuscitation and Early Stabilization Improvement in Newborns (RESIN). **bottom right:** Dr. Marko Simunovic received a CHORD grant for his project called Quality Improvement in Colorectal Cancer in LHIN 4.

Research Collaboration

top: Hamilton Health Sciences' Office of Integrated Research team. **bottom:** McMaster University's Faculty of Health Sciences Health Research Services team.

Research in Hamilton is successful because of the joint efforts of Hamilton Health Sciences and McMaster University. Cutting-edge research remains a high priority for all institutions, and our coordinated efforts have placed us among the top 25 most influential research communities in the world, based on an analysis of the impact of our research.

Dr. Salim Yusuf
Vice President of Research,
Hamilton Health Sciences

Dr. Stephen Collins
Associate Dean of Research,
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Hamilton Health Sciences

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