

Imagine

2010 RESEARCH STORIES



HEART &
STROKE
FOUNDATION
OF ONTARIO

more

laughter

fun

family

time

years

life

for all Canadians

moments

love

joy

surprises

smiles

Long Live Life.



**Together, we can
weather the storm.**

**Together, we're fighting
the newest threats.**

In 1952, a group of visionaries believed that research can improve the treatment and prevention of heart disease and stroke. Over the past 58 years, our generous donors have supported strategic investments in research that have helped reduce the incidence of heart disease and stroke by 75%, through medical advances that are working every day to save lives and speed recovery for Canadians affected by these diseases.

Today, our experts are warning us that a “perfect storm” of cardiovascular disease is brewing on the horizon, and is now poised to take far too many Canadians before their time. Cardiovascular disease is already killing more women than any other disease in Canada, and many Canadians of Aboriginal, African, Chinese and South Asian descent are experiencing historic levels of risk for heart disease and stroke. Without significant improvements in our ability to treat and prevent these diseases, many lives will be cut short.

Research is the answer. Just imagine the impact you could have by investing in strategic medical research that leads to life-saving treatments and prevention programs. In this issue of *Imagine*, you will hear about some of our world-class researchers who are passionately pushing the boundaries of heart and brain-related science to find

the answers to these serious health challenges. Through projects like these, philanthropy is already saving lives throughout Ontario and across Canada.

Imagine a future free from heart disease or stroke. The projects in these pages typify the kind of investments we make in cutting-edge science that redefines what is possible for treating and preventing the diseases that now kill 1 in 3 Canadians. Projects like these can change the world by leading to treatment and prevention options that will save lives, possibly yours and mine.

Imagine a future where Canadians will no longer fear premature death caused by heart disease or stroke. We need your help to meet these emerging challenges and move forward in our mission to eliminate heart disease and stroke. Working together, we can help give all Canadians more years of life and more life in their years.

David Sculthorpe
Chief Executive Officer



SONIA ANAND

McMASTER UNIVERSITY

the problem People of South Asian descent face a three to five times greater risk of developing heart disease, diabetes and stroke early in life.

the solution By tracking the health of 4,000 people in South Asian families, Dr. Sonia Anand and her team will learn more about when South Asians start developing risk factors. This will help them create guidelines to better prevent heart disease and stroke in this at-risk community. Dr. Anand is also testing an online intervention with 900 South Asian adults who will be given access to a culturally

tailored web site that will educate visitors, while offering a one-on-one mechanism for feedback and advice.

Imagine the outcome

“By intervening with effective health messages and strategies at the right time, we can effectively reduce South Asians’ risk of developing heart disease, and give them hope for longer, healthier lives.”

– Dr. Sonia Anand



GUILLAUME PARE

McMASTER UNIVERSITY

the problem Stroke is a leading cause of disability in Canada – and still very little is known about how the risk varies across different ethnicities.

the solution Dr. Guillaume Pare wants to examine an ethnically diverse group of Ontarians to identify which genes affect stroke risk, and to determine how these genes are affected by other risk factors such as diet, activity, blood pressure, diabetes, smoking and abnormal heart rhythm. This research could help develop tools to predict who is at the highest genetic risk of stroke and what

lifestyle changes would offer them the best protection.

Imagine the outcome

“If we can find the genes which indicate increased stroke risk across different ethnicities, prevention can be started earlier. This has the potential to seriously reduce the risk of stroke in a number of ethnic groups.”

– Dr. Guillaume Pare

Confronting the
challenge of obesity



GARY GOLDFIELD

CHILDREN'S HOSPITAL OF EASTERN ONTARIO

the problem In Ontario, 28% of children are overweight or obese and more than half of these children could face being overweight as adults — increasing their risk of heart disease and stroke.

the solution We know that being physically active can help a child maintain a healthy weight. That's why Dr. Gary Goldfield and his co-investigator, Dr. Kristi Adamo are studying the potential benefits of a physically active daycare program aimed at three to five year old children. In the study, two daycare centres will act as a control, while two others will have their staff trained to increase the

young children's physical activity levels to the point where there is no more than 60 minutes of inactivity at a time. The researchers hope that this will reveal ways to manage children's weight and body fat levels, helping them achieve and maintain good health for a lifetime.

Imagine the outcome

"By making physical activity a habit early in life, we hope children will be able to better maintain a healthy weight into adulthood, reducing their risk of early heart disease and stroke." – Dr. Gary Goldfield



KOON TEO
McMASTER UNIVERSITY

the problem Researchers suspect that a child's risk of obesity and heart disease develops early in life, but little is known about which risk factors develop first and how they should be managed for the best chance at a healthy adulthood.

the solution Dr. Koon Teo is studying a group of families to see how the first decade of life can influence a person's development of obesity and other risk factors for heart disease. In 2004, he examined the medical history, physical activity and eating habits of the families. He will follow their habits until 2014 to determine

if any risk factors have developed and their causes. This could help prevent or reduce the development of heart disease risk factors early in life before they lead to disease in adults.

Imagine the outcome

"When we know what risk factors develop at an early age and how they contribute to the risk of obesity, we can focus on managing those risks first — creating solutions to help both children and adults live healthier lives."

– Dr. Koon Teo

More years –
for Boomers

A photograph of Dr. Qingping Feng, a man with glasses wearing a light blue button-down shirt, smiling and holding a clipboard. He is standing in a laboratory setting with a microscope in the foreground. A woman with dark hair and glasses is seen from the side, looking at him. The background is a whiteboard with some faint diagrams.

QINGPING FENG

UNIVERSITY OF WESTERN ONTARIO

the problem Our growing boomer generation is at increased risk of heart failure, which has become a major threat to the quality and length of life for these Canadians.

the solution Dr. Qingping Feng's research project will look for solutions to this life-limiting disease by identifying molecules that regulate and determine heart cell function. Abnormal calcium channel function has been linked to many heart disorders, and the main goal of this research is to examine the role of these calcium channels in heart health. This will help determine whether

intervening with calcium channel drugs or gene therapy can eliminate or reduce the occurrence of heart failure.

Imagine the outcome

"We're hoping to create new targets for treatment and prevention of heart failure, improving the health and quality of life of people living with heart disease, and those who care for them."

– Dr. Qingping Feng



CLARE ATZEMA

SUNNYBROOK HEALTH SCIENCES CENTRE

the problem Atrial fibrillation (AF), an irregular rhythm of the heart, increases the risk of stroke five-fold. Its prevalence increases with age and, after age 55, the risk of AF doubles with each decade of life.

the solution Dr. Clare Atzema and her team want to help patients with AF avoid multiple visits to the hospital, which can be stressful for patients and costly to the healthcare system. Dr. Atzema wants to create a representative sample of AF patients in an Ontario registry to determine who is safe to send home, who may need to

stay in hospital longer and what treatments would be most beneficial for different patients.

Imagine the outcome

“By improving the emergency department system of care for these patients, we hope to reduce repeat visits, hospitalizations, bleeding complications, strokes, and death among Canadian atrial fibrillation patients.”

– Dr. Clare Atzema

Putting a stop to stroke



ANDREA KASSNER

HOSPITAL FOR SICK CHILDREN

the problem Clot-busting drugs save lives in ischemic stroke, but they may also increase the risk of bleeding, endangering the patient.

the solution Clot-busting drugs are recommended for treating ischemic stroke within the first 4.5 hours but, after that time, they may increase risk of bleeding. Dr. Andrea Kassner is hoping to develop a method of measuring and imaging blood vessel leakage that could help develop criteria to assess whether a patient who arrives beyond the 4.5 hour window can still safely receive clot-busting drugs. It will also allow doctors to assess the benefits

of using statins or other new drugs designed to slow or stop blood vessel injury beyond this time window.

Imagine the outcome

“The more patients who receive treatment safely, the lower their risk of facing death or disability from ischemic stroke.”

– Dr. Andrea Kassner



JAMES DANCKERT

UNIVERSITY OF WATERLOO

the problem Sixty-five percent of stroke survivors have some level of disability. One example of this is a debilitating disorder called unilateral neglect which makes patients behave as if the left half of their world — be it their plate of food or the movement of their limbs — has simply ceased to exist.

the solution Dr. James Danckert is studying the use of innovative eyeglasses that use prisms to shift vision toward the right. When patients remove the glasses, they start to move their body toward the left to compensate. However, they may still be

looking to the right and not be truly aware of their neglected side. Dr. Danckert wants to explore how he can refine this technique to correct both the behaviour and awareness of the stroke patient for better rehabilitation.

Imagine the outcome

“This research has the potential to assist patients’ recovery, with the ultimate aim of restoring their independence.”

– Dr. James Danckert

Diminishing the impact
of emerging and
existing risks



ANDREW PIPE

UNIVERSITY OF OTTAWA HEART INSTITUTE

the problem Becoming smoke-free is arguably one of the most effective ways to reduce a person's risk of premature death from heart disease and stroke. However, almost 20% of Canadians still smoke.

the solution Nicotine patches can improve a person's chances of remaining smoke-free, but they contain a fixed-dose of nicotine that may not be enough to reduce withdrawal and cravings in heavy smokers. Dr. Andrew Pipe's research examines the treatment of smokers based on how many cigarettes they normally smoke

in a day. One group will receive an individualized nicotine-patch treatment while others will be given a standard-dose patch. Their quit rate will be compared and assessed one year later.

Imagine the outcome

"We are seeking to transform how nicotine replacement therapies are provided in order to improve long-term smoking cessation and significantly reduce the risk of heart disease and stroke."

– Dr. Andrew Pipe



KUMARASWAMY NANTHAKUMAR

UNIVERSITY HEALTH NETWORK

the problem Every year, about 6,000 deaths in Canada are caused by air pollution and 69% of these deaths are linked to heart disease or stroke — in particular, arrhythmias (irregular beating of the heart).

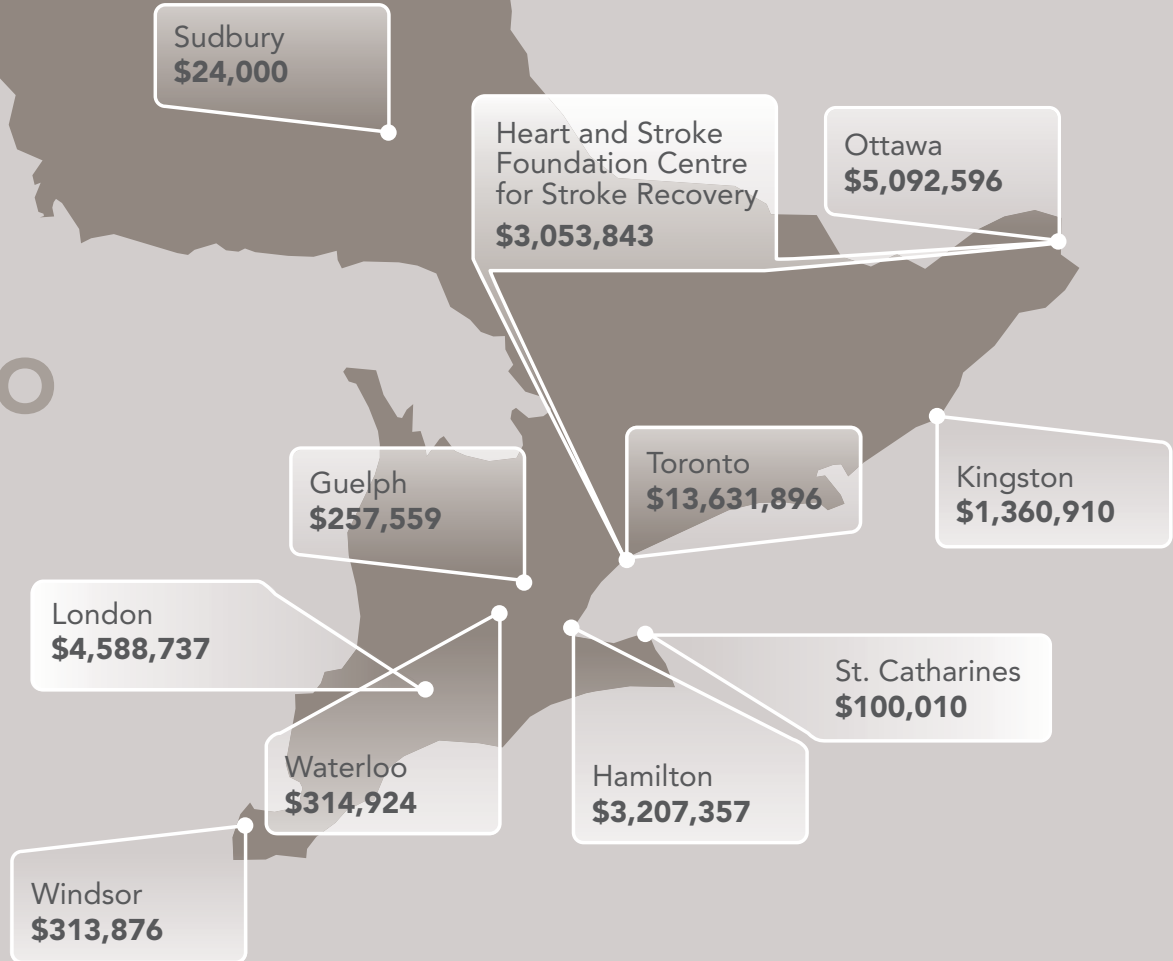
the solution Dr. Kumaraswamy Nanthakumar's research is examining how ozone and carbon particles in air pollution affect the risk of arrhythmias. By looking at interactions between these particles and specific areas of the human heart, he hopes to discover the reason behind the increased susceptibility caused by air pollution.

Imagine the outcome

"By addressing this knowledge gap in Canada, we can use this information to increase public and government awareness about the adverse effects of air pollution. Consequently, we can affect government adoption of new policies that can lead to better health and quality of life for Canadians."

– Dr. Kumaraswamy Nanthakumar

ONTARIO



2010 RESEARCH INVESTMENTS

GREATER TORONTO AREA

| | |
|--|-------------|
| Baycrest Centre | \$80,000 |
| Centre for Addiction and Mental Health | \$165,300 |
| Hospital for Sick Children | \$1,795,633 |
| Mount Sinai Hospital | \$588,206 |
| St. Michael's Hospital | \$1,684,804 |
| Sunnybrook Health Sciences Centre | \$1,628,174 |
| University Health Network | \$3,693,421 |
| University of Toronto | \$3,424,412 |
| York University | \$571,946 |

ONTARIO WEST

| | |
|-------------------------------|-------------|
| London Health Sciences Centre | \$1,466,928 |
| Robarts Research Institute | \$1,416,659 |
| University of Western Ontario | \$1,705,150 |
| University of Windsor | \$312,876 |

ONTARIO NORTH

| | |
|-----------------------|----------|
| Laurentian University | \$24,000 |
|-----------------------|----------|

ONTARIO EAST

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|--|-------------|
| Children's Hospital of Eastern Ontario | \$80,558 |
| Ottawa Hospital Research Institute | \$1,129,920 |

| | |
|--------------------------------------|-------------|
| Queen's University | \$1,360,910 |
| University of Ottawa | \$1,575,804 |
| University of Ottawa Heart Institute | \$2,306,314 |

ONTARIO CENTRAL

| | |
|------------------------|-------------|
| Brock University | \$100,010 |
| McMaster University | \$3,207,357 |
| University of Guelph | \$257,559 |
| University of Waterloo | \$314,294 |

| | |
|---------------------------------------|-------------|
| HSF Centre for Stroke Recovery | \$3,053,843 |
| Ontario Stroke System Research Grants | \$313,197 |
| Canadian Stroke Network | \$107,143 |
| Multi Provincial Grants | \$306,356 |
| National Research Awards | \$5,489,278 |
| Other Research Investments | \$2,832,958 |

Total research investment: \$40,993,010

Heart and Stroke Foundation of Ontario

2300 Yonge Street, Suite 1300

P.O. Box 2414

Toronto, ON M4P 1E4

Tel: 416 489 7111

Fax: 416 489 6885

Email: heartandstroke@hsf.on.ca

Website: www.heartandstroke.ca

Business Number: 10747-2839-RR0001

