McGuinty Stresses Link Between Medical Innovation and Provincial Prosperity

Premier McGuinty and Dr. Roberts review UOHI’s innovative approach to identifying genes responsible for coronary artery disease.

“Increasingly, new surgical techniques at the Institute are relying on less-invasive practices to solve medical problems associated with Coronary Artery Disease.”

- Dr. Mesana, who has led significant changes at UOHI’s Division of Cardiac Surgery

“In fact, we’re still making firsts in research labs throughout Ontario. We developed the world’s first pacemaker, improving the quality of life for Ontarians. We gave the world insulin, a discovery that has saved countless lives. We developed the world’s greatest discoveries. We gave the world its freedom.”

- Premier McGuinty

“In the 21st century, we’re living longer and healthier. We’re reaching new heights in our health care system for Ontarians.”

- Dr. Michele de Margerie, UOHI

“Today, our hospitals are among the best in the world, delivering world-class care.”

- Dr. Robert Roberts, President and CEO

McGuinty: Our government created a new Ministry dedicated to research and innovation, and I am leading this ministry, to signal how important innovation is to Ontario’s prosperity in the 21st century. Our goal is to create a culture of innovation in Ontario because when we support research and innovation, we help improve the quality of life for Ontarians. Ontario has been home to some of the world’s greatest discoveries. We gave the world insulin, a discovery that has saved countless lives. We developed the world’s first pacemaker, improving the quality of life for millions of heart patients. And we’re still making firsts in research labs throughout Ontario.

We will continue encouraging research and innovation in Ontario’s hospitals because this work can lead to more groundbreaking discoveries and knowledge that will benefit our people, and improve both health care services and the health care system for Ontarians.

The Beat: What is the value to Ontario of being home to “world leaders” in medicine and other disciplines?

McGuinty: In the new knowledge-based economy, our government is investing in innovation so we can attract the best and the brightest researchers and research projects from around the world. We know that the countries and jurisdictions that invest in innovation, that tap into the Canadian Science and Engineering Hall of Fame and other disciplines, are being home to “world leaders” in medicine. By being home to “world leaders” in medicine, we will attract the brightest researchers and research projects from around the world.

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Innovation and Research Fuel New Directions in Cardiac Surgery

Last fall, cardiac surgeons at UOHI performed the first minimally invasive thoracoscopic surgical procedure in Canada to correct an irregular heartbeat using a bipolar electrical device. The procedure essentially reset the patient’s heartbeat to remediate an atrial fibrillation after inserting a miniature fiber-optic camera through a small incision to monitor the inside of his chest cavity.

Atrial fibrillation (AF) is the most common form of irregular heart beat in older patients and, chronic AF is associated with heart failure, blood clots and increased risk of stroke.

The intricate surgical technique was performed to short-circuit the troublesome nerve endings responsible for abnormalities in the heart’s electrical impulses. The thoracoscope transmitted a picture of the heart onto a video monitor during the procedure, eliminating the need to carve open the breastbone to get a better view inside the chest cavity. With the thoracoscope in the small incision, the surgeon could see his way to the pericardial sac surrounding the heart rather than fully opening the chest to view the heart.

The procedure takes only a few hours and offers significant benefits. Patients who have thoracoscopic surgery generally experience less pain and scarring afterwards and have a quicker recovery than with traditional open-heart surgery. The procedure also lowers the potential for serious infection from a larger open wound.

“It is very efficient and is effective in 90 to 95 percent of cases,” says Dr. Thiberry Mesana, Chief of Cardiac Surgery at UOHI. “The patient’s heart rhythm was fully restored in all three cases done so far.”

Increasingly, new surgical techniques at the Institute are relying on less-invasive practices to solve medical problems associated with Coronary Artery Disease (CAD), says Dr. Mesana, who has led significant changes at UOHI’s Division of Cardiac Surgery since his appointment in 2001. The complexity and necessary skill
A greater number of francophones smoke, other sociolinguistic groups. Francophones have a higher rate of heart diseases (such as high blood pressure) and serious complications with regard to chronic diseases (such as diabetes). There is no significant difference between francophones and the general Ontario population.

A new study published in December 2005 – the Ontario Ministry of Research and Innovation and the University of Ottawa Heart Institute, in collaboration with the Ministry of Francophone Affairs, has found that francophones in Ontario have better access to health care providers and specialized care.

New outreach programs from the University of Ottawa Heart Institute (UOHI) are helping to achieve these goals. The Beat, an online magazine, reported on UOHI’s new initiatives to improve access to health care for Ontario’s francophone community.

McGuirk: Ottawa is my hometown and I’m very proud of the work being done to improve health care and support innovation.

Innovation — because we believe in the creative potential of all Ontarians. I chose to lead that Ministry because I believe that unlocking that potential is essential to our province’s future.

Part of creating a culture of innovation in Ontario is supporting researchers. In Ontario, we support world research leaders through programs such as the Ontario Research Fund (ORF), the Ontario Research and Development Challenge Fund, and the Ontario Innovation Trust.

Just a few weeks ago, we announced the recipients of the latest round of ORF infrastructure grants. In fact, our government has committed over $100 million from the ORF to more than 150 infrastructure projects in communities across Ontario. In total, we’ve committed $1.8 billion to research and commercialization over four years.

Our government will also be establishing the Ontario Research and Innovation Council (ORIC) – so we can get the best possible advice from a panel of experts on how to promote Ontario’s strengths and develop strategies for mobilizing all sectors of the economy to support our innovation agenda.

The Beat: How can organizations like the University of Ottawa Heart Institute help the province to achieve its innovation goals?

McGuirk: They play an important role. They can help us create a culture of innovation by continuing to nurture, support and reward a culture of creativity within their organization, as well as enhancing innovation partnerships and working with innovation support organizations like Ontario’s Regional Innovation Networks and the Sector Innovation Networks.

The Beat: Is there anything in particular you’d like to say to UOHI’s family of administrators, doctors, nurses, allied health professional staff and others?

McGuirk: I understand that the dedicated staff at the UOHI treats over 80,000 heart patients every year. I want to take this opportunity to thank everyone at this remarkable facility for the work you do every day, for the sacrifices you make and for your commitment to improving the lives of Ontarians.

I also want to tell you that our government is doing its part, too. We are committed to improving the level of care for Ontarians – and I know that if we continue to work together, we can and will provide an even higher level of care for the people we serve.

The Beat: What would be your most important goal? Would you like to say to UOHI’s family of administrators, doctors, nurses, allied health professional staff and others?

McGuirk: I believe that this remarkable facility can continue to help us create a culture of innovation in Ontario.

“We know from experience that home-based rehab programs managed by telephone contact are as successful as on-site rehabilitation,” says UOHI’s Dr. Michele de Margerie. “FrancoForme is the only service of its type anywhere in the country that offers primary prevention and it is available at no cost to the patient.”

Together, these programs represent important steps in improving the quality of health care for Ontario’s francophone minority and underscore UOHI’s commitment to deliver top-notch cardiac services that are available for everyone.

Overcoming Distance and Language to Better Serve Patients

New outreach programs from UOHI are ensuring that a key francophone population in Ontario has better access to health care and health information.

A 2005 statistical profile from the province’s Office of Francophone Affairs shows that Eastern Ontario is home to more than 40 percent of the province’s francophone population and it has grown twice as fast as other francophone communities. Francophones make up about 15 percent of the population in Eastern Ontario, or about one in seven people, and a significant number live in rural areas. As well, francophones are under-represented in health sector occupations in the province.

A new study published in December 2005 – The Second Report on the Health of Francophones in Ontario – notes there is no significant difference between francophones and the general Ontario population with regard to chronic diseases (such as high blood pressure) and serious injuries. However, it also notes that francophones have a higher rate of heart disease due primarily to differences in health behaviours between francophones and other sociolinguistic groups.

A greater number of francophones smoke, and suffer from obesity and heart disease than non-francophones. In general, they do not seek medical attention from community physicians or health providers. Consequently, they tend to present late and often in crisis to emergency facilities.

As a minority, francophones suffer from a lack of social support and a decreased social network. Francophones living in rural areas are also at risk of social isolation. The need to access services in French as well as remaining within their community which typically supports their linguistic needs must be considered an important feature in health care delivery.

To address these requirements, UOHI is undertaking two significant projects that represent important steps in improving health care delivery for Ontario’s francophones.

The first project, started in September 2005, involves two technology initiatives. The first uses home technology to forge linkages between the patient, primary health care providers and specialized cardiac services. This initiative offers heart failure patients living in rural areas the opportunity to transmit by phone line and special home monitoring equipment their weight and vital signs for a three-month period. The approach is building an important medical network that enables the local general physician (GP) to access specialized care and treatment resources while encouraging patients to be more involved in their recovery.

“This project represents a big step in chronic disease management,” said Dr. Renee Arnold, a family doctor at the Hawkesbury District General Hospital that serves the largest percentage of francophone living in Eastern Ontario. “Patients are active participants, GP’s are linked electronically and it can be adapted for other chronic illnesses. As well, it helps keep patients out of the hospital.”

The second initiative uses interactive voice response technology that automatically calls francophone surgical patients at home on the third and tenth day after discharge to query their condition. This interval spans the period of highest post-surgical complications and the system ensures prompt attention to issues or problems that develop.

“Overall our goal for these initiatives is to improve access and coordination of care,” said Heather Sherwood, UOHI’s VP of Clinical Services. “In this first phase of the program we will be assessing the impact on readmission, patient and provider satisfaction and quality-of-life to help influence the development of a phase-2 program.”

UOHI’s second project is a joint undertaking between the Institute’s Prevention and Rehabilitation Centre and the Eastern Ontario Health Unit called FrancoForme. It has recently been launched and has more than 15 patients that have signed up. Building on UOHI’s successful experience with case-managed individuals undergoing a home-based cardiac rehab program, FrancoForme has been designed for hard-to-reach patients. It offers the rural francophone community primary and secondary prevention in the form of one-on-one counseling. Available by phone and in-person for a period of 6 months, the patient receives weekly coaching and support on a wide variety of health factors such as obesity, nutrition and diet, smoking cessation, exercise and stress management.

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levels required for innovative surgical practices, he adds, are compounded by a growing population of older patients, who tend to suffer multiple illnesses ranging from diabetes with its accompanying vascular problems to lung and kidney diseases in addition to CAD. “The magnitude of our patients has risen,” he says. “Frequently we operate on octogenarians — patients who are more than 80 years old. We have performed surgery on a 91-year-old. Some 70-year-olds are in good health other than a heart problem, which has to be repaired. And we can repair them.”

As a result of the changing patient profile, Dr. Mesana says the UOHI is adopting the newest approaches to minimize the use of the heart-lung machine, which for new remains the standard during open-heart surgery. Recent advances in cardiac surgery and medical devices have enabled less invasive options, such as beating-heart or ‘off-pump’ procedures. These options, Dr. Mesana says, are considered for patients facing complex medical conditions such as diabetes, a history of stroke or in poor physical health, and who are considered at risk if a heart-lung machine is employed. The heart-lung machine, referred to as a ‘pump’ mechanically pumps oxygen and nutrients to the body during surgery while the heart is stopped. “There may be more risk with blood issues,” he says. “These include coagulation problems, strokes and heart attacks — even if the operation was successful.”

Through research and by adopting innovative techniques, Dr. Mesana says UOHI’s team is building on its expertise in reconstructive cardiac surgery valve surgery, applying less-invasive approaches to Coronary Artery Bypass Grafting (CABG), and exploring the potential for regenerative growth in the heart through molecular research.

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— Dr. Thierry Mesana, Chief of Cardiac Surgery at UOHI

More Modern Tools in the Future

“The cardiac surgeon of the future will be more skilled at reconstructing the heart using modern tools of medicine, such as molecular biology. He or she will be a basic scientist as well as a surgeon,” says Dr. Mesana, who has initiated clinical development of heart repair and enhanced the bulk of adult cardiac surgery, says Dr. Mesana, involves CABG and valve surgery. UOHI has actively pursued a number of new techniques including Off-Pump Coronary Artery Bypass (OPCAB), which are performed routinely by only a limited number of surgeons in Canada. UOHI is a national leader in mitral valve reconstruction, used to rebuild the injured heart valve that hampers blood flowing through the heart’s chambers if it doesn’t open or close properly.

Valve surgery has traditionally involved replacement. Mitral valve replacement offers a better long-term solution for the patient, says Dr. Mesana, and reduces the risk of recurrent problems. Mitral valve repair can be performed through smaller incisions but reconstruction requires learning the unique anatomy of each patient. Over 120 reconstructions each year, one of the largest numbers in Canada, he says.

“For the first time in the history of the UOHI, the number of repairs has surpassed the number of replacements,” says Dr. Mesana. “This represents a major change in surgical practice — repairing the valve rather than replacing it.”

In addition, surgeons use the latest techniques to treat atrial fibrillation. These include the minimally invasive thoracoscopic procedure and surgical atrial fibrillation ablation, a procedure that prevents abnormal electrical impulses from beginning at all. UOHI performs about 200 cases annually of surgical atrial fibrillation ablation. Often atrial fibrillation ablation is performed simultaneously with mitral valve repair or CABG. UOHI cardiologists also perform catheter-based ablation, in which a catheter is inserted through the groin to reach the heart. An energy source then ablates or destroys abnormal tissue responsible for the fibrillation or flutter. “This is for patients who have no valve disease or no chronic CAD but who have AF that has caused symptoms such as heart failure or stroke,” says Dr. Mesana. Surgical practice at UOHI now involves a combination of procedures, he says. A patient with coronary artery disease and heart failure, for example, may undergo mitral valve repair or replacement and coronary bypass procedures simultaneously or at different times.

New Hope with Less Risk

Traditional coronary artery bypass grafting remains the standard in cardiac surgery at UOHI, says Dr. Mesana. This traditional technique requires splitting open the sternum or breastbone and using the heart-lung machine. But UOHI surgeons have developed strong expertise with several procedures for selected patients, particularly those with complex medical problems who may have a less favourable outcome with the heart-lung machine, he says. These procedures require an extremely high level of skill and experience, he adds. The following approaches have become alternatives to the traditional coronary bypass graft:

• Off-Pump Coronary Bypass or Beating Heart Bypass avoids the use of a heart-lung machine, which mechanically serve as the heart and lung while the heart is stopped during traditional bypass procedures.

• Multi-Vessel Small Thoracotomy (MVST) accesses the heart through a small incision. The breastbone is not carved open and the heart remains beating. The surgeon uses a suction tool to move the heart into position for grafting on each region. This technique is performed at only a few centres in North America. Together the innovative approaches in surgery coupled with intensified research into the underlying causes of and discovery of new treatments for heart disease, UOHI is forging a new generation of leaders in cardiac surgery, says Dr. Mesana.

“Mine is the generation who will help move this forward into a new era. Our role now is to help propel the younger surgeons into new frontiers because this is what they will be doing for the last half of their careers.”

Why is Off-Pump Coronary Surgery Underused in Canada?

Research shows patients prefer the latest advances in coronary surgery and medical devices over the traditional approach. Research shows patients prefer the latest advances in coronary surgery and medical devices over the traditional approach. Why is Off-Pump Coronary Surgery Underused in Canada?

Dr. Thierry Mesana

“Cardiac surgery involves a constant evolution. The cardiac surgeon of the future will be more skilled at reconstructing the heart using modern tools of medicine such as molecular biology.”

• Chief, Cardiac Surgery, UOHI; appointed 2001

• Chair, Transplant and Devices Committee, UOHI

• Chair, Cardiovascular Surgery, University of Ottawa

• Fellow, Royal College of Physicians and Surgeons of Canada

• Member, Society of Thoracic Surgeons; European Association of Cardiothoracic Surgeons; International Society for Heart and Lung Transplantation, and Canadian Cardiovascular Society

• Former professor, Cardiac Surgery; Chairman, Thoracic and Vascular Surgery, Faculty of Medicine, University of Mediterranean, Marseille, France; until 2001

• Special interests: adult cardiac surgery, heart valve disease, mitral valve repair, surgery of thoracic aorta and aortic dissection, surgery of heart failure, and ventricular assist devices

Beating Heart Surgery

Patients who are older and face additional medical problems such as diabetes now have surgical alternatives to the traditional coronary artery bypass graft. Cardiac surgeons at UOHI are performing more innovative and less invasive operations, which allow patients to recover more quickly and reduce the risk of other complications such as the potential for stroke. Both procedures require an extremely high level of skill and dexterity.

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A new Endowed Research Fellowship in Cardiology has been created at UOHI with a $1 million fund for a leading researcher to investigate new techniques and treatments for disorders of the cardiovascular system.

A total of 11 Endowed Research Fellowships are planned as part of an ambitious $100 million fund-raising program by the Heart Institute Foundation, which has amassed significant endowment funding at UOHI. Recruitment now is under way to fill the Endowed Research Fellowship in Cardiology. And over the course of the next five years, the Foundation will help ensure research capability at UOHI expands to match the calibre of expertise that has ranked it among the top cardiac medicine facilities in North America.

Another objective is to grow and mentor a network of young leaders as next-generation philanthropic stewards for both UOHI and the Foundation.

A series of major private donations to the Foundation has already moved UOHI to the forefront of cardiovascular research. The Canadian Cardiovascular Genetics Centre℠ opened in mid-2005 as the only facility of its kind and one of the few labs in the world dedicated to exploring the genetic makeup of coronary artery disease (CAD). With more than $1 million in state-of-the-art gene sequencing, DNA analysis and GeneChip™ technology, UOHI researchers have launched a pilot study involving 2,000 patients to investigate the root cause of CAD at the genetic level. The Centre was made possible by a $5 million gift from Ottawa business leader John Ruddy and his wife Jennifer. The fund was boosted by $500,000 donations from The Harold Crabtree Foundation, Herb and Dorothy Nadolny with Lyon and Dundi Sachs, and the Vered and Benzer Families.

The Ottawa community has clearly embraced the importance of strong research efforts into innovative medical technologies and new more effective approaches in the prevention, diagnosis and treatment of heart disease. “These donors are very sophisticated in what they want to achieve with their donations,” says Thomas Hewitt, President of the University of Ottawa Heart Institute Foundation. “There is a wider vision and appreciation of research as the critical investment that will have a significant and lasting impact on the future of UOHI. This has everything to do with patient care. Researchers attract the best physicians because they are always willing to push the envelope with cutting-edge diagnostics and treatment.”

More than $10 million is being raised to create the Endowed Research Fellowships, which will include the following fields:
- Atherosclerosis
- Cardiac Imaging
- Cardiac Surgery
- Cardiovascular Genetics
- Cardiovascular Nursing
- Electrophysiology
- Heart Function
- Heart Health Research in Women
- Hypertension Research

“The UOHI will move to the next level by becoming a research juggernaut in the area of cardiac medicine,” adds Hewitt. “We will continue to underscore the promise of cardiac research to our community to earn their support.” Efforts to press forward with bold plans for a significant endowment sends a strong signal of UOHI’s intention to attract renowned scientists and remain competitive in the prevention, rehabilitation, diagnosis and treatment of coronary artery disease.

The newly appointed Foundation Chair is Lawrence Soloway, a prominent Ottawa business lawyer who helped shepherd the Endowment Campaign from 2000 onward as campaign chair. Soloway was awarded the Queen’s Jubilee Medal in 2002 for his significant contribution to the community.

The Endowment Fund allows UOHI to continue to grow in prestige as a leader in medical care and research, Soloway says. “The Research Fellowships are all about people who can devote themselves exclusively to research. You get a clear sense of mission here and that is important for those of us who support the Institute.”

While the Research Fellowships form the centrepiece of the Endowment campaign, other endowment opportunities in the form of Lectureships and Endowed Chairs have received substantial support. These provide permanent funds for prestigious visiting lecturers in cardiovascular medicine to sustain a stimulating and vibrant culture of research at UOHI.

A total of 11 Endowed Research Fellowships are planned as part of an ambitious $100 million fund-raising program by the Heart Institute Foundation.

The very nature of the Foundation’s work is forward looking in all its objectives. Securing a strong corps of young leaders to carry on future philanthropic and volunteer activities is no less crucial, says Hewitt. The Foundation has developed a program to foster a network of dynamic young business and community leaders to support next-generation growth at UOHI and to serve as ambassadors for the Institute. Through leadership mentoring and networking opportunities, the Foundation is essentially planning its own succession and grooming future directors of the boards of the Foundation as well as UOHI.

The City of Ottawa is a rich breeding ground for community and corporate leadership. The city supports a highly vibrant environment of innovation and research into human health and medical technology. Ottawa is home to two research-intensive universities and is headquarters for both Health Canada and the National Research Council, with its own National Research Institute. The University of Ottawa and Carleton University are equipped with Canada’s first dedicated laboratories in biotechnology and biomedical engineering research. The region has long been a high-profile centre of research and development. Leading medical technology enterprises, such as Chicago-based Abbott Laboratories, are moving into the region. Abbott is opening a major R&D facility in the region for one of the world’s largest medical technology products groups, Abbott Point-of-Care. Given the breadth of such resources in the region, the Foundation can continue to strive for success and help assure UOHI’s position as a leader in prevention, rehabilitation, diagnosis and treatment of coronary artery disease.

John A. Hopp (1919-1998) was recently inducted into the Hall of Fame at the Canada Science and Technology Museum. Hopp was an electrical engineer, is considered to be the “father” of biomedical engineering in Canada. He invented many devices to assist the blind and people with muscular disabilities. However, his most significant creation occurred in 1949, when he invented the world’s first cardiac pacemaker.

Today, hundreds of thousands of pacemakers are inserted annually in North America. Here at UOHI, some 450 units are inserted every year.

Hopp’s invention is responsible for maintaining his own life. In 1981, UOHI’s Dr. Wilbert Keon replaced a valve in his heart and predicted he would require a pacemaker. The prediction came true in 1984, when Hopp received his first pacemaker. In 1997, UOHI’s Dr. Paul Hendry replaced this unit with a more advanced model.

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