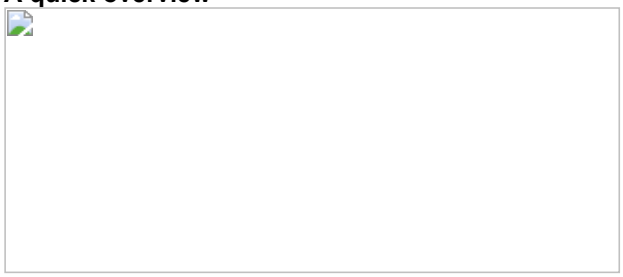
Ottawa Hospital Research Institute (OHRI) Research Annual Report
Retour The Ottawa Hospital

At A Glance

A quick overview



The OHRI is the research arm of The Ottawa Hospital and an affiliated institute of the University of Ottawa. Our goal is to make tomorrow's health care possible today; bringing new hope to our patients, while advancing health research at a global level. With more than 1,500 scientists, clinical investigators, trainees and staff, as well as total revenues of nearly $100 million, OHRI is one of the foremost Canadian hospital-based research institutes.

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Board Chair Message

The key driver behind world-class health care is an innovative, committed research team.

Research helps us develop better approaches for treating, diagnosing and preventing disease, and it provides novel ideas and tools for improving the delivery of health care. As you will see in this report, the connection between innovative research and patient care is particularly strong at the Ottawa Hospital Research Institute (OHRI), where more than 1,500 scientists, clinical investigators, students and staff are working together to improve care at The Ottawa Hospital, throughout Eastern Ontario, and around the world.

Over the last decade, OHRI's priorities have become increasingly linked with those of The Ottawa Hospital, and we have developed a number of unique programs to support the translation of research into benefits for our patients and the community. Our relationship with the University of Ottawa and other partners in the city has also become stronger, with a number of important collaborative projects on research equipment, training and commercial development of innovations. Our researchers have also continued to rank well above the national average in grant competitions held by the Canadian Institutes of Health Research (CIHR) and because of this success, OHRI is now the fourth largest hospital-based research institute in the country in terms of CIHR funding.

It must be said that OHRI's success is attributed first and foremost to all of the research team members, who work long hours every day to advance science and improve the lives of others. The community has also played a key role in supporting OHRI research by donating to The Ottawa Hospital Foundation though events such as Ride the Rideau, and we are very thankful for this continued support. Finally, I would like to acknowledge the many volunteers who donate their time to OHRI, including all of our dedicated Board Members.

With all of these pieces in place, I believe our strong momentum will continue, delivering even more success in the years to come.

Ken Newport,
Chair, Board of Directors,
Ottawa Hospital Research Institute

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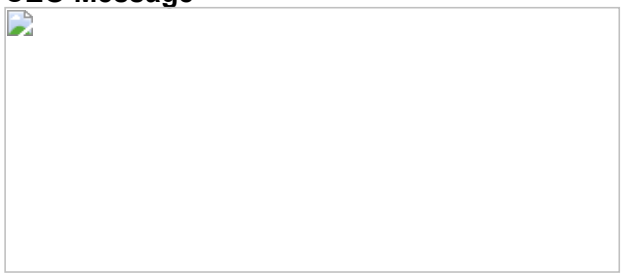
CEO Message



Like many health professionals, I got involved in research because I couldn't accept having to tell my patients "there is nothing more we can do for you." Today, thanks to research, I don't have to say this nearly as often as I used to, and I have real hope that in the future I may not have to say it at all.

As you'll see in this report, our scientists are making exciting advances that are improving care at The Ottawa Hospital and around the world, as well as fuelling more hope for the future.

For example, Dr. Michael Schlossmacher is leading the development of groundbreaking new approaches for the early detection Parkinson's; Dr. Marc Rodger is spearheading the expansion of an innovative new treatment program for life-threatening blood clots; and Dr. Marjorie Brand's group is making important progress in understanding how adult stem cells help replenish our blood.

All of this exciting work has been catalyzed through partnerships between researchers with very different areas of expertise. A culture of collaboration is a key strength of OHRI and, indeed, the entire Ottawa health research community.

In the last year, we've made great progress in strengthening our partnerships with The Ottawa Hospital, the University of Ottawa and its Faculty of Medicine, and we've worked closely with CHEO, the University of Ottawa Heart Institute and the Champlain Local Health Integration Network on a number of projects. By working together in this way, I believe our city can enhance its competitiveness on the world stage and lead the way in making groundbreaking medical discoveries, providing world-class patient care, training the next generation of scientists and health professionals, and creating the jobs of the future.

As you'll see in this report, OHRI has reached a number of important milestones this year. We released our three-year strategic directions, which outline a number of initiatives designed to enhance our ability to translate research into benefits for patients and society. We've completed the construction of new laboratories for innovative cancer and regenerative medicine research, and we're on track to open a new building for high-impact clinical research later this year. We've also grown to become the fourth largest hospital-based research institute in the country in terms of funding from the Canadian Institutes of Health Research (CIHR). Given the increasing competition for CIHR grants, our success in this area is a strong testament to the exceptional quality of our research.

I would like to conclude by recognizing all of our trainees, scientists, clinical investigators, staff and volunteers for a year of incredibly hard work. I would also like to thank the many individuals who have supported our research through generous donations to The Ottawa Hospital Foundation. I am honoured to lead the Ottawa Hospital Research Institute into what promises to be another banner year.

Dr. Duncan Stewart
CEO and Scientific Director, Ottawa Hospital Research Institute
Vice-President, Research, The Ottawa Hospital
Professor of Medicine, University of Ottawa

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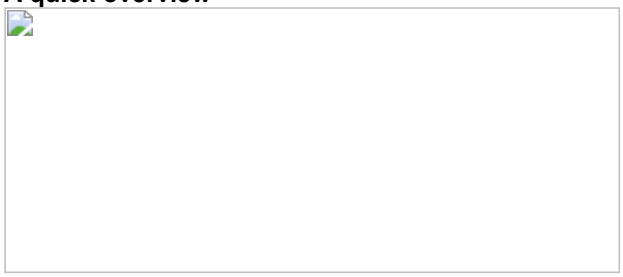

Vision & Mission

The OHRI's vision is to give our patients and their loved ones new hope through research that is making tomorrow's health care possible today.

This vision expresses our commitment to research that is focused on patients and inspired by patients. We approach our work with compassion and dedication each day, knowing that every question we answer and every problem we solve could eventually impact many people, including our own loved ones.

To support our new vision, we have developed two strategic research priorities:

1. Regenerative and biological therapeutics: Fostering "bench to bedside" research by turning basic discoveries in cellular and molecular biology into new regenerative and biological therapeutics to improve health.
2. Practice-changing research: Putting knowledge to work by performing high quality clinical research that can inform health decisions, and ensuring that results are optimally applied to improve health.

We have also developed a cross-cutting strategic research theme on vascular health, which is designed to foster an exciting area of research that focuses on the role of blood vessels in health and disease. This theme cuts across all of our existing programs, fits well with our partners and addresses a major challenge for the health and well-being of Canadians.

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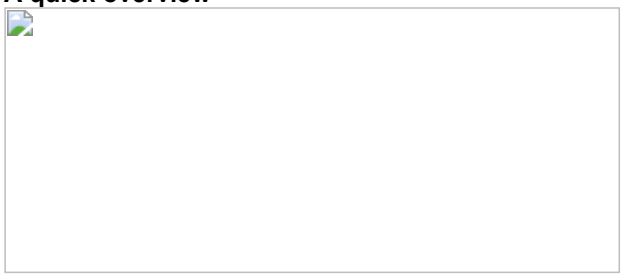

Who

Research is a team activity at the OHRI, involving scientists, clinical investigators, trainees and specialized support staff. Patients also play a crucial role in research by volunteering for studies and providing inspiration and ideas for improving care.

Scientists

OHRI has 105 scientists leading teams of five to 30 people each. Scientists have MDs, PhDs, or both, and spend the majority of their time on research. All OHRI scientists are also professors at the University of Ottawa and many are active physicians at The Ottawa Hospital.

Investigators

Investigators are generally physicians, nurses, or other health-care professionals at The Ottawa Hospital. They devote significant time to research while also being very active in clinical practice. OHRI has almost 400 investigators.

Trainees

OHRI has about 400 trainees who conduct much of the hands-on research at OHRI and come up with many of the innovative ideas for new studies. Trainees include graduate students, postdoctoral fellows, undergraduates, summer students and volunteers. Most are undertaking research at OHRI as part of a degree at the University of Ottawa.

Support staff

OHRI depends on more than 700 highly specialized support staff to conduct groundbreaking research. Support staff members coordinate clinical trials, manage research programs and operate sophisticated laboratory equipment. They also take care of health and safety, commercialization, finance and other areas of administration.

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What

Research at OHRI is focused on answering important health questions and translating new findings into benefits for patients and society. With more than 1,500 scientists, clinical investigators, trainees and staff, we are investigating virtually every major disease and condition. Our research spans the full spectrum of health science, from basic molecular biology and epidemiology, to clinical trials and the development of new therapies, to health services and knowledge translation research.

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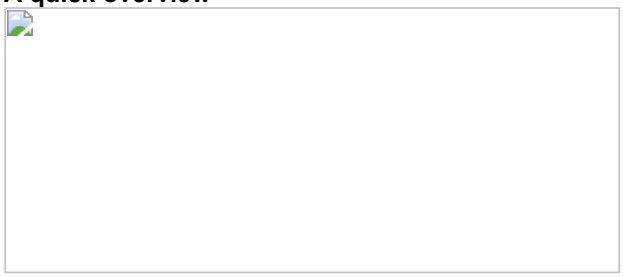
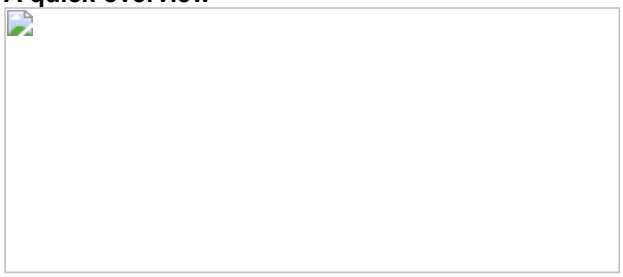


Where

The OHRI is based at The Ottawa Hospital, with activities in nearly all clinics at all three campuses (Civic, General and Riverside). We have specialized laboratories such as the Sprott Centre for Stem Cell Research, the Centre for Innovative Cancer Research and several Good Manufacturing Practice Laboratories.

OHRI is also in the midst of the largest expansion in its history thanks to two prestigious grants obtained through the Canada Foundation for Innovation's Research Hospital Fund.



Leadership Team

The OHRI is a not-for-profit corporation governed by a Board of Directors that includes members of the University of Ottawa, The Ottawa Hospital, The Ottawa Hospital Foundation and the community.

Board Chair

- Ken Newport, Biotech Entrepreneur

Board Vice-Chair and Treasurer

- Ian Mumford, Chief Operating Officer, Canadian Blood Services

Board of Directors

- Dr. Jacques Bradwejn, Dean, Faculty of Medicine, University of Ottawa
- Ian Curry, President and CEO, DNA Genotek
- Don Hewson, President and CEO, HBS Marketing
- Dr. Jack Kitts, President and CEO, The Ottawa Hospital
- Rose Lipiec, Financial Planner, TD Waterhouse Financial Planning
- Randall Marusyk, Managing Partner, MBM Intellectual Property Law
- Dr. Mona Nemer, Vice-President, Research, University of Ottawa
- Lynn Pratt, Partner, Deloitte & Touche LLP
- Dr. Denis Prud'homme, Dean Faculty of Health Sciences, University of Ottawa
- Dr. Duncan Stewart, CEO and Scientific Director, Ottawa Hospital Research Institute, Vice-President of Research, (TOH) and Professor of Medicine, uOttawa
- Bashir Surani, Member of The Ottawa Hospital Board of Governors
- D. Lynne Watt, Partner, Gowling Lafleur Henderson LLP
- Shirley Westeinde, Chair, Westeinde Group of Companies

Senior Management Team

The OHRI's senior management team provides scientific and administrative leadership.

- Dr. Duncan Stewart, CEO and Scientific Director
- Dr. Jay Baltz, Associate Scientific Director, Trainees
- Dr. Dean Fergusson, Program Director, Clinical Epidemiology
- Dr. Antoine Hakim, Program Director, Neuroscience
- Robert Hanlon, Chief Operating Officer
- Dr. Rashmi Kothary, Associate Scientific Director
- Dr. Michael McBurney, Program Director, Cancer Therapeutics
- Dr. Leo Renaud, Associate Scientific Director
- Dr. Michael Rudnicki, Program Director, Regenerative Medicine
- Dr. Alexander Sorisky, Program Director, Chronic Disease
- Dr. Valerie Wallace, Program Director, Vision
- Dr. Phil Wells, Associate Scientific Director, Clinical Research

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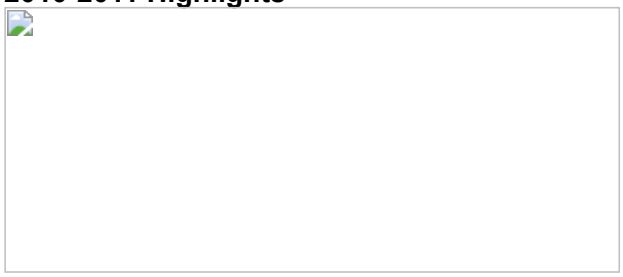
2010-2011 Highlights



Research improving health today

- **Improving care for traumatic neck injuries**: People who have been in car accidents or suffered other physical traumas are now receiving better care for neck injuries thanks to Dr. Ian Stiell's Canadian C-Spine Rule. This rule helps emergency room physicians and nurses determine which patients require special care (i.e. immobilization and diagnostic imaging) for potential neck injuries. This ensures that all patients receive the most appropriate care promptly, which reduces emergency department wait times for everyone. After extensive research, the rule is now being implemented in 10 Ontario hospitals, thanks to a grant from the Council of Academic Hospitals of Ontario (CAHO). Please see CAHO for details.
- **Better screening for diabetes after pregnancy**: Women who suffer from pregnancy-related diabetes are now receiving better follow-up care, thanks to research led by Dr. Erin Keely. Dr. Keely and her colleagues developed a reminder system that has resulted in twice as many women receiving the recommended diabetes screening six months after giving birth. The system, which has now been implemented at The Ottawa Hospital and the Queensway Carleton Hospital, is helping many women receive the counseling and treatment they need to manage their risk of diabetes. Please see *Chronic Diseases in Canada* for details.
- **Preventing dangerous infections in cystic fibrosis patients**: People with the genetic lung disease cystic fibrosis are now being better protected from lung infections thanks to research led by Dr. Shawn Aaron. Dr. Aaron and his team discovered that a dangerous strain of bacteria is spreading between cystic fibrosis patients in Ontario, and this has already led to better infection control procedures for these patients. Please see the *Journal of American Medical Association (JAMA)* paper for details.
- **Preventing stroke**: People who are treated for mini-strokes at The Ottawa Hospital have an excellent chance of avoiding a full-blown stroke thanks to a comprehensive research-based stroke prevention program. Developed by Dr. Mike Sharma, the program involves coordinated efforts between neurologists, emergency physicians and other health professionals, as well as a patient-centred approach for counseling about stroke risk factors. A recent study showed that mini-stroke patients who participated in this program had just a 3.2 per cent chance of suffering a full-blown stroke within three months, compared to a 10 per cent chance at other centres. Please see the American Heart Association's *Stroke* journal for details.
- **Looking out for patient safety**: Patients at The Ottawa Hospital are now receiving safer care thanks to a patient safety surveillance system developed by Dr. Alan Forster and colleagues. The system involves a nurse observer who regularly monitors units and records details about potential patient safety events in a novel web-based form. The system has been so successful that it is now being expanded to other hospitals in Ottawa and Montreal as part of a research project funded by the Canadian Institutes of Health Research. Please see *British Medical Journal (BMJ) Quality & Safety* for details.

Research providing hope for tomorrow

- **Breakthroughs in Parkinson's**: Diagnosing and treating Parkinson's disease may one day be easier, thanks to new research led by Dr. Michael Schlossmacher. Dr. Schlossmacher and his team have developed an experimental approach to detect Parkinson's earlier and more accurately by measuring the level of a protein called alpha-synuclein within the spinal fluid. They have also unraveled the biology behind a well-known link between Parkinson's and Gaucher disease, and the results suggest that drugs that have already been developed for Gaucher may also be useful in people with Parkinson's. Please see *Lancet Neurology* and *Annals of Neurology* for details.
- **Developing new stem cell therapies**: New research led by Dr. Duncan Stewart suggests that a commonly used type of bone marrow stem cell may be able to help treat sepsis, a deadly condition that can occur when an infection spreads throughout the body. The study shows that mesenchymal stem cells can reduce organ damage, help clear infection and triple the overall survival rate in experimental models of sepsis. Please see the *American Journal of Respiratory and Critical Care Medicine* for details.
- **Cancer-fighting viruses**: Dr. John Bell and his team have made exciting progress in the development of cancer-fighting viruses. They recently discovered that in addition to directly infecting and killing tumours, these viruses also indirectly kill tumours by infecting and destroying the blood vessels that feed them. This study was conducted in laboratory models, but a similar effect has also been observed in patients and the work is fuelling further innovative clinical trials. Please see *Molecular Therapy* for details.
- **Investigating novel anti-cholesterol therapies**: Dr. Xiaohui Zha and her group have discovered a potential new strategy to reduce the buildup of cholesterol in blood vessels. They found that a commercially available peptide called st-Ht31 changes the location of cholesterol-processing machinery within certain blood vessel cells, and this causes the cells to release large amounts of excess cholesterol. While this research is still at early stages, it provides hope that new strategies may be found reduce the risk of heart disease and stroke. Please see the *Journal of Biological Chemistry* for details.

- **Understanding gene regulation in stem cells**: A new discovery led by Dr. Marjorie Brand provides crucial insight into the fundamental question of how one protein can have opposite effects inside different types of cells. Specifically, Dr. Brand and her group found that in blood stem cells, the TAL1 protein activates genes that promote the healthy development of red blood cells. However, when TAL1 is found in certain white blood cells, it activates a completely different set of genes and promotes the development of leukemia. This discovery, which involved a number of groups at OHRI, has important implications for the development of new therapies to regenerate blood and fight leukemia. Please see the *European Molecular Biology Organization (EMBO) Journal* for details.
- **Personalizing cancer treatment**: Dr. Christina Addison and colleagues have found a potential new biomarker to help predict which lung cancer patients are likely to benefit from a new targeted anti-cancer therapy. After analyzing blood samples from more than 500 patients, they found that those who had low levels of a protein called Transforming Growth Factor alpha were more likely to benefit from the drug erlotinib. They also found another potential biomarker that could help predict overall survival. The findings provide an important contribution to the development of more personalized treatments for cancer. Please see the *Journal of Clinical Oncology* for details.
- **New insight into how HIV causes AIDS**: New research by Dr. Jonathan Angel's group is shedding light on the important question of how exactly HIV weakens the immune system. While is has been known for many years that HIV directly infects and kills T cells, Dr. Angel's research shows for the first time that HIV also disrupts the IL-7 signalling pathway that is crucial for T cell development, function and survival. This research is important because it suggests that IL-7-based therapies for HIV (which are currently in clinical trials) may need to be augmented with therapies that restore the IL-7 signalling pathway. Please see the *Journal of Leukocyte Biology* for details.

Milestones and special recognition

- **Growth in funding**: The OHRI has grown to become the fourth largest hospital-based research institute in the country in terms of funding from the Canadian Institutes of Health Research (CIHR). Despite an increasingly competitive research environment, OHRI scientists have continued to rank well above the national average in CIHR grant competitions, and thanks to this success, OHRI is now one of the top research institutes in the country.
- **Our top researchers of the year**: Three OHRI researchers were honoured for their outstanding work at The Ottawa Hospital's 2010 Gala for Research. Graduate student Melissa Bowerman was recognized for her promising work in developing new treatments for Spinal muscular atrophy (under the supervision of Dr. Rashmi Kothary); Dr. Lynn Megeney was recognized for his groundbreaking work on stem cell development; and Dr. John Bell was recognized for his exceptional research career, including his leadership in developing of cancer-fighting viruses. Please see the news story for details.
- **Leadership in clinical research**: Dr. Jeremy Grimshaw was elected Co-Chair of the Cochrane Collaboration, a highly prestigious international research network that helps people make informed health-care decisions. The Cochrane Collaboration is the world's leading independent assessor of medical interventions and medical research, with more than 28,000 contributors from more than 100 countries. Please see the news story for details.
- **Leadership in kidney research**: Dr. Kevin Burns was awarded the Kidney Foundation of Canada's 2010 Medal for Research Excellence. Dr. Burns is recognized as a leader in translating kidney research into clinical practice and he has also made many contributions to the training of kidney researchers, including the development of the KRESCENT program. Please see the news story for details.
- **Building world-class research facilities**: The Ottawa Hospital Research Institute recently completed construction of a new Centre for Innovative Cancer Research. The facility includes specialized manufacturing and testing laboratories that will reduce the time it takes for laboratory discoveries to benefit patients. Researchers at the new centre are leading the world in developing biological therapies for cancer, such as cancer-fighting viruses. They are also working to develop more personalized therapies that are targeted to each patient's unique type of cancer. This laboratory is one of several new research facilities that will be opening soon at OHRI, thanks to a prestigious grant from the Canada Foundation for Innovation and generous support from the community.

The power of research:
How the treatment of blood clots is being revolutionized right here in Ottawa

This is the story of Dr. Marc Rodger and his team's groundbreaking thrombosis research.

Like many things in life, blood clots can be both helpful and harmful. They can save lives by sealing up wounds. They can prove deadly if they lodge in an organ and block blood flow.

As a thrombosis specialist at The Ottawa Hospital (TOH), Dr. Marc Rodger detects potentially deadly blood clots in the veins, breaks them up safely, and prevents them from coming back. As a senior scientist at the Ottawa Hospital Research Institute (OHRI), he designs and tests new strategies for managing blood clots. His research has had an enormous impact at TOH, and around the world.

"The reason thrombosis research is important to me is that I can see that we can very effectively do something to help patients," says Dr. Rodger, also a professor of medicine at the University of Ottawa. "We've made improvements everywhere from prevention to diagnosis to treatment. Being able to make a difference - not only to patients locally, but also changing care for a generation of patients internationally - that's something that matters to me."

Over the last 10 years, Dr. Rodger and his colleagues have developed diagnostic models that are used around the world to streamline the detection of blood clots.

They have pioneered an innovative home-based blood clot treatment program and an interactive phone system to provide patients with regular drug dosage updates.

They are leading a major international clinical trial to improve the prevention of blood clots in high-risk pregnant women, and they have also developed a tool to predict when patients can safely stop blood clot treatment.

These innovations not only saved lives, they make treatments easier and more efficient for patients, their families and the health care system.

World-class care: a patient's story

The OHRI's Thrombosis Group has made a difference in countless lives, including that of well-known Ottawa lawyer and businessperson Thomas d'Aquino.

After experiencing sharp pain in his upper back, in 2005 d'Aquino was diagnosed with a double blood clot in the lung, and was later found to have a rare blood clotting condition called protein S deficiency.

"My first question was, 'how can I read up on this thing that has happened to me?'" recalls d'Aquino. "Dr. Rodger was able to give me some research papers, including some papers that he and his colleagues had authored, and that was very helpful for me to quickly understand what it was that I was dealing with."

"It's not very often you meet a doctor who can diagnose what the problem is, but at the same time spends a considerable amount of time doing serious research," says d'Aquino. "That, to me, is the best combination."

As a result of OHRI research, d'Aquino was diagnosed rapidly, treated without being admitted to hospital and kept on life-saving blood thinners permanently.

"If Mr. d'Aquino would have come to us 12 years ago when I was in medical school, he would have been admitted to hospital and waited until Monday to get his scans to prove that he had a blood clot in his lung," says Dr. Rodger. "He would have been treated in hospital with intravenous medications for a week, and then discharged on oral blood thinners."

Thomas d'Aquino was discharged from the emergency room the Sunday night he came in, and has been treated as an outpatient ever since.

"The fact that I was being treated with something so serious, yet allowed to walk out the door and go home was very special, and psychologically, I think that was very important," says d'Aquino.

"We've gone from a decade ago where all of this was done inefficiently in hospital at great burden to the system and to patients, to an efficient, streamlined, outpatient care model," says Dr. Rodger.

Measuring the impact

How do you measure the impact of this research on patients like d'Aquino?

A key way to assess the quality of care is to examine the thickness of patients' blood – it needs to be just thick enough to allow clotting if there is a wound, but not so thick that it causes clots to form when they aren't needed. At the TOH Thrombosis Clinic, patients' blood is in the ideal thickness range 80 per cent of the time, which is far greater than the 50 to 60 per cent range typical of other centres.

"I'm a huge fan of the Thrombosis Clinic," says d'Aquino. "Everyone at the clinic has always treated me so well: everyone from that wonderful lady with the booming voice in the reception area…to the staff that work with Dr. Rodger. I've just had excellent treatment."

To learn more about the Thrombosis Research Group, please click here.

Breakthrough OHRI Thrombosis Research Publications

- Oake N et al. CMAJ January 2009;180(9):927-933.
- Anderson DR et al. JAMA 2007;298:2743-2753.
- Rodger MA et al. CMAJ 2008;179(5):417-426.
- Wells PS et al. JAMA 2006;295(2):199-207.
- Wells PS et al. N Engl J Med 2003;349(13):1227-35.

The power of compassion: How an ICU patient attended the birth of his ninth child

This is the story of Ottawa Rabbi Yehuda Simes.

"It was just a regular, absolutely uneventful drive, but the totally unexpected took place," says Rabbi Simes, describing an accident that took place in June 2010, after a deer jumped out in front of his family vehicle. "In order to protect our family, [my wife] Shaindel had to veer around the deer, but the car lost control."

Seven of eight Simes children were in the vehicle with Rabbi Simes and his wife, who was seven months pregnant with the couple's ninth child. Though the children and Mrs. Simes escaped with only minor injuries, Rabbi Simes was crushed by the ceiling of the van.

Rabbi Simes was airlifted to the closest hospital in the U.S. for trauma treatment, until shortly after when he was transferred to his home town, and The Ottawa Hospital (TOH).

"When we received the call requesting transfer arrangements, Dr. John Kim and I looked at each other and said – 'we have to bring this man home,'" says Nancy McDonald, Clinical Manager of the Intensive Care Unit (ICU) at the General Campus of TOH.

Once he arrived, TOH quickly mobilized Rabbi Simes' health team. Paralyzed from the neck down, Rabbi Simes was ventilator dependant and required total care. Physicians, registered nurses, respiratory therapists, occupational therapists, physiotherapists, and others made it their mission to provide him with the best possible care.

There was also the matter of Mrs. Simes' pregnancy. There too, a team of TOH professionals stepped in, even assisting the family to ensure their religious traditions could be accommodated in the clinical environment.

"Everyone was very efficient, very calming and very relaxing," says Mrs. Simes.

The hospital team gave her a phone number that she could call 24/7 for any support she needed.

"We knew all the staff personally," she says with a smile, recalling the family ice cream celebration TOH facilitated when the children were first reunited with their father. "We always laughed that our kids had a great time at the ICU because they had so many friends there."

Ice cream was one thing. Fulfilling the Simes family's wishes for the birth of their ninth child, however, presented an entirely different set of challenges.

Mrs. Simes expressed that it was incredibly important that her husband be present for the birth. TOH didn't hesitate: the team knew they had to work together to make this happen.

Step one was transferring Mrs. Simes to the General Campus, where her husband was in ICU, from the Civic Campus, where she had been treated in the past.

To ensure the rest happened as safely as possible, TOH also needed to coordinate two teams of experts: the one caring for Mrs. Simes in her delivery and the one responsible for the quality and safety of Rabbi Simes' care during his move from ICU to the maternity ward.

McDonald recalls how intensively the team worked to make this happen.

"We met weekly, to the point where we even had Rabbi Simes and Mrs. Simes come to our meetings to be part of their plan of care," says McDonald.

"We prepared a bag for the Rabbi with all of the things that we would need," says Julie Boulianne, Respiratory Therapist. The team had sourced all the equipment they would need in advance, so that Rabbi Simes could be safely transported out of ICU the moment his wife went into labour.

"This case was no different from what we would do for any other patient coming in," said Sharon Chothia, Registered Nurse in the Birthing Unit at the General Campus, adding that Mrs. Simes "came in very, very quickly, in the middle of the night."

Mrs. Simes arrived at 3:50 a.m., and delivered at 4:30 a.m. In the short 40 minutes that it took her to deliver, both the ICU and the birthing unit sprung in to action to make the couple's wish a reality.

Mrs. Simes says she will never forget the final moments of her delivery.

"Just as my baby was being born, they yelled 'he's coming – he's coming! He's here!'" she recalls. "My husband literally was brought into the room within moments – seconds – of our baby being born."

"The joy was incredible," says Rabbi Simes. "The miracle was so blatant. They had the baby ready for me. As I held that miracle baby, I said the blessing that we say when babies are born. It was a beautiful experience."

The power of innovation: How technology transforms health care at TOH

This is the story of how The Ottawa Hospital (TOH) is harnessing the power of technology to transform health care.

TOH launched its five-year technology and innovation plan in 2009. The strides made by TOH in 2010 are now accelerating the pursuit of our goal to become one of North America's top 10 per cent of hospitals in terms of quality and patient safety.

Here is a snapshot of the innovation that is enabling improvements to patient care at TOH:

PSLS: Putting patient safety first

TOH implemented the Patient Safety Learning System (PSLS) in April, 2010. PSLS is a simple and intuitive system that aims to find gaps in the reporting and review of adverse events. The goal of the PSLS is to strengthen TOH's culture of quality and patient safety by encouraging timely, voluntary adverse event and incident reporting. PSLS allows TOH and its health-care professionals to meet this goal, making incident reporting simpler; by giving the team the tools to identify systemic problems more effectively; and by identifying best practices and lessons learned that the team can apply to avoid mistakes in the future.

"Our goal is to identify systemic problems that are putting patients at risk for harm, and then learn about those risks so we can develop strategies to prevent that harm," says Dr. Alan Forster, Scientific Director of Clinical Quality and Performance Management. "No other organization that we're aware of has built a system that contains the components that we have. We believe it will be a major breakthrough for patient safety."

SIMs: Computerized charting, seamless flow of information

Used at every stage of the surgical process – from admission to anaesthesia, to surgery, to recovery – TOH's Surgical Information Management System (SIMs) is a computerized charting and scheduling system that makes it possible for the care team to access a patient's chart from virtually anywhere in the hospital.

This allows TOH to provide patients with smoother transitions of care, and more time with clinicians at the bedside. It also means we make better use of our valuable resources, improving management of the equipment supply chain.

By using the Smart Track Board (similar to an airport arrivals screen), staff can also determine, in real time, what stage of the surgical process a patient has reached to keep loved ones up-to-date.

Another bonus of the system is the insight it provides hospital researchers and clinicians through the data it collects.

"One of the biggest impacts for us is the ability to retrieve real time data," says Joanna Schubert, Clinical Manager of the surgical suites at the General Campus. By analyzing data, care teams can find more efficiency in the surgical process.

SIMs is the only surgical system of its kind in Canada.

CPOE: Seamless order entries

Integrated with the iPad, TOH's Computerized Physician Order Entry (CPOE) system makes it easy to retrieve information and order treatments online right at the bedside. Formerly a manual process that was riddled with paperwork, this new program removes all the manual steps. The result is faster turnaround on all the elements of care we provide for our patients.

"Wait times for examination appointments in the Department of Medical Imaging have always been a major challenge for The Ottawa Hospital," explains Maryam Vafaei, Project Manager of the Prescription Information Management System and the Online Protocol Module for the Department of Medical Imaging. "This computerization has reduced protocoling time, which used to take 10 days, or even a few weeks, to two days, or even a few hours."

iPads: Better access to patient information, better care

TOH recently ordered 1,800 iPads, in addition to the 500 already in use by our health-care providers. iPads enable TOH physicians to examine patient information, make legible notes, and relay important information back to patients, right at the bedside. This allows patients timelier responses to their questions, increases productivity, and decreases paperwork in the clinical environment.

"At The Ottawa Hospital, our vision is to provide our patients with the world-class care, exceptional service and compassion that we would want for our loved ones," says Dale Potter, Senior Vice President and Chief Information Officer. "We have learned that using technology to optimize clinical processes and decision making empowers care givers to provide more effective patient care. Mobile devices provide information where needed, when needed, in real time"