

# From research to care:

## Five years of Canadian “firsts” pave the way for decades of medical advancement

By Claire Samuelson

In 1922, Canadian researchers Drs. Charles Best and Frederick Banting discovered insulin as a treatment for diabetes. In 1950, Toronto physicians Bill Bigelow, John Callaghan and John Hopps developed the first artificial pacemaker to be used in open heart surgery. In 1961, the scientific world was in awe of Drs. James Till and Ernest McCulloch who made an incredible discovery that later enabled the first bone marrow transplant: the identification of blood forming stem cells.

Since the dawn of modern medicine, scientists at Canada's research hospitals have made countless life-saving discoveries and international, national and

local “firsts” that translate ground-breaking research into innovations in care. These breakthroughs have transformed countless lives and facilitated decades of research into many complex and life-threatening conditions such as heart disease, diabetes, cancer, and respiratory disease.

These healthcare and research “firsts”, which appear in reputable print media, are tracked through HealthCareCAN's award-winning tool, Innovation Sensation, a searchable database that highlights innovative breakthroughs from Canada's research hospitals. We encourage you to visit [www.healthcarecan.ca](http://www.healthcarecan.ca) to view thousands of other healthcare and research “firsts”, and pick your favourites.

### Changes coming to B.C. cancer treatment system

July 21, 2016

British Columbia is the first province to implement Oncopanel genomic screening for cancer patients, but it won't be the last, and the list of treatable mutations will continue to grow and become more robust as each patient's information is added to the database. Agencies across Canada are also working together to discuss the accelerated clinical trials of off-label treatments with pharmaceutical companies.

### Vancouver Coastal Health sets new guidelines for treatment of opioid addiction

November 3, 2015

Vancouver Coastal Health has established a “first-of-its-kind” guideline in the treatment of opioid addiction, recommending that doctors use an alternative to methadone as a first line treatment. The nine recommendations are aimed at improving physicians' knowledge of treatment options in light of ongoing challenges with methadone and opioid overdoses linked to fentanyl and oxycodone.

### Results of world's first study on new treatment for heroin addiction

April 6, 2016

The results of a ground-breaking research project have revealed an effective new treatment tool for chronic heroin addiction: hydromorphone, a licensed and widely-available pain medication. Led by a team of researchers from Providence Health Care, this is the first and only clinical trial of its kind in the world. The research study found hydromorphone to be as effective as pharmaceutical-grade prescription heroin, providing a licensed alternative to treat severe opioid use disorder.

### Unveiling B.C.'s first digital mammography vehicle

February 24, 2015

British Columbia's first mobile digital mammography vehicle has been unveiled by the province's Health Minister. The breast cancer screening vehicle is first of three mobile units intended to reach rural areas, in an attempt to transition away from analog mammography. 10 per cent of

all screening mammograms in British Columbia are performed by the mobile fleet.

### Spinal Cord Injury Program at HSC Winnipeg first in Canada to receive accreditation

August 10, 2016

The Spinal Cord Injury Program at Winnipeg's Health Sciences Centre is one of the first in Canada to be accredited under new standards. The interdisciplinary team at the Centre provides specialized trauma, orthopedic and rehabilitative care, among many other services, to approximately 50 to 60 people with spinal cord injuries each year. The program recently underwent review, achieving unprecedented ratings of 99 and 100 per cent.

### Women's College unveils Toronto's first [high-tech] outpatient hospital

June 12, 2013

Women's College Hospital has unveiled Toronto's first outpatient clinic. The contemporary facility is a significant milestone in the province's plan to transition health care out of hospitals and into home and community settings, where patients are more comfortable and are less at risk of exposure to harmful infection. Designed to allow patients to return home as quickly as possible, there are no in-patient beds, and surgery patients only stay up to 18 hours.

### Medicine as Unique as You

November 12, 2014

A team at the University Health Network has developed a genetic test that identifies which men are at highest risk for prostate cancer recurrence. The test could revolutionize the way the disease is treated by helping to identify men that require more aggressive treatments while preventing the over-treatment of those who don't.

### Local researcher examines new way to capture images of brain for Alzheimer's disease

June 15, 2016

A researcher at the Thunder Bay Regional Research Institute has discovered a more effective way to study the brain while treating Alzheimer's disease. The goal of

the research is to provide a more accurate measurement of the brain function in Alzheimer's patients using hyperpolarized xenon. It is believed that when patients inhale hyperpolarized xenon gas, researchers will be able to take a clearer picture of the brain when using an MRI machine. This study will be the first large scale clinical trial in the world using hyperpolarized gas to take an image of the brain.

### Toronto hospital becomes world's first to treat brain tumour with non-invasive procedure

November 9, 2015

Scientists at Sunnybrook Health Sciences Centre are the first in the world to use focused ultrasound to breach the blood-brain barrier of a patient with brain cancer precisely and noninvasively. They used focused ultrasound, pioneered by a Sunnybrook Research Institute scientist, to deliver chemotherapy directly to the brain tumour. They are poised to launch another world first: evaluating this technology for patients with Alzheimer's disease.

### North American first in children: SickKids doctors destroy bone tumour using incisionless surgery

August 6, 2014

The Hospital for Sick Children is the first facility in North America to perform a specialized procedure that uses ultrasound and MRI to destroy a bone tumour without piercing the skin. In collaboration with Sunnybrook Health Sciences Centre, physicians used an MRI to guide high-intensity ultrasound waves to destroy a benign bone tumour called osteoid osteoma. The 16-year-old child experienced excruciating pain for a year prior to the procedure, and is now pain-free.

### World first in imaging technology developed at Lawson

December 8, 2015

Researchers at Lawson Health Research Institute, in collaboration with Ceresensa Inc., produced the first commercial imaging product available in the world for PET/MRI scanners. The novel PET-transparent MRI head coil provides unparalleled images to advance the study, diagnosis and

treatment of a wide range of diseases. At St. Joseph's, the coil is being used for research on schizophrenia and depressive disorders, Alzheimer's disease, dementia, and the study of brain damage resulting from chronic dialysis.

### Researchers produce first widely protective vaccine against chlamydia

July 21, 2016

Canadian researchers have developed the first widely protective vaccine against chlamydia, a common STI that is mostly asymptomatic but impacts millions of people around the world each year and can result in infertility. Performed at St. Joseph Healthcare Hamilton's Research Institute, the study would be the best way to treat the infection, and may prevent or eliminate its damaging reproductive consequences.

### Where's Zika going next? Maybe China, India, or Nigeria

September 1, 2016

In January 2016, before the World Health Organization declared Zika virus a public health emergency, Dr. Kamran Khan published a letter in *The Lancet* highlighting the potential for this emerging virus to spread rapidly across the Americas. In that analysis, southern Florida was identified as one of the highest risk areas for viral introduction and local spread, which was ultimately borne out last month. As health officials scramble to understand the mosquito-borne virus, Dr. Khan, an infectious disease specialist and scientist at St. Michael's Hospital, is using big data to develop models to anticipate where and when an outbreak is most likely to occur in the world.

### The Royal gets NATO's first research chair in military mental health

December 11, 2014

The Royal Ottawa Health Care Group will become home to NATO's first research chair in military mental health. Col. Rakesh Jetly, senior psychiatrist with the Canadian Armed Forces and Mental Health Adviser to the Surgeon General, says that there is work to be done on research that will translate into new treatments for those with PTSD. Canada and

its NATO partners will work together to share and amplify research in this ever-important area.

**Ottawa Hospital launches world's first clinical trial of double-virus cancer treatment**

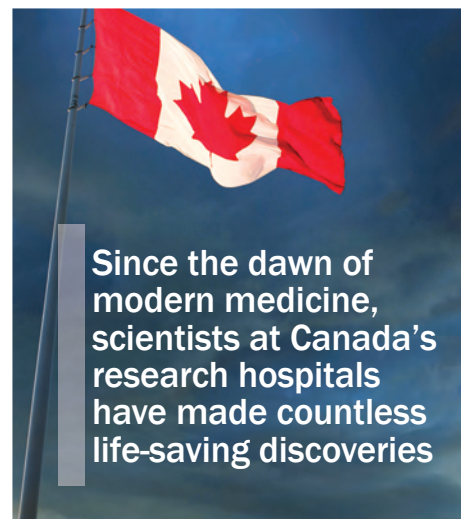
July 10, 2015

Researchers at The Ottawa Hospital have launched a clinical trial that seeks to use two viruses to attack the cancer cells of patients with advanced tumours. The clinical trial, a joint effort between The Ottawa Hospital, the Children's Hospital of Eastern Ontario and McMaster University, is the first in the world to use one virus to directly kill cancer cells and another to stimulate the patient's own immune system to fight the cancer. Combining these two approaches could dramatically increase the chances of success.

**Blood test identifies women at risk of preterm delivery**

June 24, 2016

Researchers at the Lunenfeld-Tanenbaum Research Institute have developed a blood test that detects if a pregnant woman is at risk of delivering her baby prematurely. With an 86 per cent accuracy rate, the new test is more accurate than any existing procedure. This test is important as buys physicians time to implement measures to help prevent a pre-term delivery.



Since the dawn of modern medicine, scientists at Canada's research hospitals have made countless life-saving discoveries

**Montfort recognized for integrating midwives into hospital**

May 31, 2015

Hôpital Montfort is believed to be the first hospital in North America to officially give midwives privileges to conduct births without transferring care to an obstetrician, although a medical team is available if needed. The hospital promotes a holistic approach to maternity care, encouraging communication between family doctors, obstetricians, midwives, and nurses.

**World first in prostate cancer treatment at LHSC**

April 24, 2013

Researchers at London Health Sciences Center and Lawson Health Research Institute now offer a minimally invasive treatment option for patients with localized prostate cancer. The world first treatment utilizes a new device that uses thermal ultrasound therapy with real-time MRI guidance to destroy cancer cells in the prostate gland. Physicians have an improved view that allows the whole prostate gland to be treated in one session and with greater accuracy.

**KGH team performs a North American first in endoscopy**

December 19, 2012

The Endoscopy team at Kingston General Hospital has successfully performed the first endoscopic procedure in North America using a biodegradable esophageal stent. Esophageal stents are used to improve the quality of life for patients who find it difficult or impossible to swallow due to a narrowing of the esophagus. The device is a revolutionary tool that could dramatically improve the lives of many.

**World's first concussion research centre**

July 2, 2014

Holland Bloorview Kids Rehabilitation Hospital is home to a new Concussion Clinic focused on children and youth with persistent and long-lasting concussions. The Concussion Clinic is one of the world's first research institutes to focus on paediatric concussions and will be the first of its kind in Ontario dedicated to children who are affected by ongoing concussion symptoms.

**Safe place for sick kids in Sudbury**

August 25, 2016

A Health Sciences North acute care centre will soon be offering a comfortable, safe space for families whose children are ill. Located at Ramsey Lake Health Centre, the first Ronald McDonald House Family Room in Northern Ontario will be ideally situated in a spot between the paediatrics and neonatal wards at the hospital.

**New procedure at Hamilton's Juravinski centre cuts chemo wait time**

November 24, 2014

The Juravinski Hospital and Cancer Centre is the first Canadian hospital to adopt a new procedure that has improved care for chemotherapy patients. The procedure uses new technology to ensure accurate placement of a peripherally inserted central catheter (PICC) which delivers chemotherapy medication through a large vessel near the heart. The procedure has drastically cut wait times for chemotherapy patients.

**Canadian researchers unravel the underlying biology of rare childhood disorders**

June 6, 2014

A nationwide research team, led at CHEO, used exome sequencing technology to study a wide range of rare childhood genetic disorders including neurodegenerative conditions and those that affect multiple systems in the body. The team solved 146 disorders, including the identification of 67 novel genes that had never been associated with a rare disease before.

**In a Canadian first, family practice offers genetic testing with CAMH to predict which psychiatric meds work best**

January 30, 2013

The Centre for Addiction and Mental Health (CAMH) is the first Canadian hospital to offer genetic testing to predict

how patients will respond to psychiatric medications, and the first to deliver these tests in primary care. Results show which medications will be effective for a patient, and which ones will not work or may cause side effects. The test is now available in the community through the IMPACT study. CAMH also has the first Canadian patient on a gene that predicts antipsychotic-induced side effects (weight gain), which is under study in a randomized controlled trial of pharmacogenetics testing.

**New network aims to wean seniors off inappropriate prescription drugs**

February 26, 2016

Scientists at the Bruyère Research Institute have developed the first ever de-prescribing guidelines. Currently, there are many prescribing guidelines that tell you when to begin taking a drug, but none address when it might be appropriate to stop taking it. The aim of the project is to reduce unnecessary and inappropriate medication use in older patients by 50 percent by 2020.

**Mental stimulation may offset impact of poor diet on cognition**

July 25, 2016

Researchers at Baycrest in Toronto have demonstrated for the first time that a lifetime history of mental stimulation and high cognitive reserve can partially offset the neurocognitive disadvantages associated with consuming a poor diet. This new study suggests that mental stimulation may help offset the cognitive decline associated with a traditionally "Western" style diet, heavy on red meat, processed foods, sugary drinks, and baked goods.

**Genetic discovery about childhood blindness paves the way for new treatments**

January 12, 2015

Researchers at the Montreal Children's Hospital of the McGill University Health Centre have discovered a new gene that is critical for vision. This breakthrough opens up new treatment avenues for children and adults suffering from retinal degenerative diseases.

**Revolutionary surgery for lung cancer**

July 11, 2016

The University of Montreal Hospital Research Centre (CRCHUM) is launching a major international clinical trial to test a minimally invasive and safer surgical approach for patients with lung cancer: video-assisted thoracoscopic (VATS) lobectomy with ultrasonic pulmonary artery sealing.

**World first clinical study launched in patients facing a therapeutic dead end launched at CHU Sainte-Justine**

October 26, 2015

A new drug combination being trialled in a groundbreaking CHU Sainte-Justine/University of Montreal study is giving hope for survival, healing and improved quality of life to the 20 per cent of children who do not respond to standard cancer treatments. Known as DEC-GEN, it is the world's first study involving children

with solid tumors or recurrent or refractory leukemia.

**New research centre takes on new meaning for cancer researcher**

August 22, 2016

A partnership between Vitalité Health Network, the Université de Moncton, and others, New Brunswick's first hospital research centre, the New Brunswick Centre for Precision Medicine, is slated to be built by April 2018 and will be home to cutting edge biomedical, genomics and population health research.

**Horizon Health eliminates visiting hours for family at hospitals**

February 1, 2016

The Horizon Health Network is the first health authority in Atlantic Canada to eliminate visiting hours for family members in its hospitals. Horizon Health introduced its new Family Presence Policy recently, allowing family to visit patients staying in Horizon Health hospitals whenever they wish. The change is an attempt to recognize the importance of family in a patient's healing process.

**IWK Health Centre home to unique imaging room**

December 14, 2015

The IWK Health Centre in Halifax, Nova Scotia is home to a one-of-a-kind imaging room, equipped with a unique technology – the first of its kind in Canada. The digital imaging machine is unique as it combines a nuclear medicine camera and a standard CT camera. Obtaining simultaneous images of function from the nuclear medicine camera, and anatomy from the CT camera affords health professionals vastly improved diagnostic capabilities.

**Halifax doctors aim to perform Canada's first face transplant**

July 9, 2012

A group of Halifax doctors aim to make Halifax a prime destination for face transplants. Patients that would be potential candidates would include those with trauma-related injuries and burns. If everything goes as planned, Canada's first face transplant could be performed within one year.

**Newfoundland health board launches end-of-life planning program**

May 12, 2016

Soon, Newfoundland patients will be asked to think more about their final days when they arrive for treatment at Eastern Health hospitals. In a new policy, patients will be asked to consider what type of procedures they want performed, and which they do not, while in the last stages of their lives. The program is optional, and patients will not be forced to make advanced decisions. It is the first time Eastern Health has undertaken a broad regional strategy of promoting these types of important conversations. ■

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