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Canadian Institutes of Health Research

Milestones in Canadian Health Research

Canadian health research: saving lives, making history

Canada's health researchers have made many life-saving discoveries. From Banting and Best's insulin innovation to today's advancements in health-care delivery, our country has led the way in making the world a healthier place. Take a tour through some of the important milestones in Canadian health research history.

Years [1920s | 1930s | 1940s | 1950s | 1960s | 1970s | 1980s | 1990s | 2000s]

1920s

"With the relief of the symptoms of his disease, and with the increased strength and vigor resulting from the increased diet, *the pessimistic, melancholy diabetic becomes optimistic and cheerful*. Insulin is not a cure for diabetes; it is a treatment."
Dr. Frederick G. Banting, Nobel Prize Lecture, 1923

1921

Insulin changes lives of diabetics
Drs. Banting and Best, Collip and Macleod discover insulin, revolutionizing the treatment of diabetes, and give the Canadian scientific community its first Nobel Prize.

1925

Of hormones and bones
Dr. James Collip discovers parathyroid hormone. The discovery increases understanding of how our bodies regulate calcium concentrations and eventually leads to new treatments for osteoporosis.

Return

1930s

"Brain surgery is a terrible profession. If I did not feel it will become different in my lifetime, I should hate it."
Dr. Wilder Penfield

1930

Feeding babies better
Researchers at the University of Toronto announce the creation of Pablum; royalties from its sales still support research at Toronto's Hospital for Sick Children.

1934

Treating seizures in Montreal
Dr. Wilder Penfield establishes the Montreal Neurological Institute. Dr. Penfield developed a surgical method for treating epilepsy, called the Montreal Procedure.

1936

The roots of CIHR
National Research Council (NRC) establishes the Associate Committee on Medical Research.

Return

1940s

"At the age of 20, I had my first course in histology; I enjoyed it and wondered about becoming a histologist. Friends tried to dissuade me: 'Histology,' they said, 'is a dead horse. The future is in biochemistry.' I chose histology anyway, worked at it for 50 years, and never looked back. Many exciting things happened in the field during these 50 years... all powerful kicks for a dead horse."
Dr. Charles Leblond

1944

Jumpstarting molecular research
Dr. Maud Menten, one of Canada's first female physicians, performs the first protein separation using electrophoresis. To this day, electrophoresis is a standard research tool in genetics and other biological sciences.

1945

The polio vaccine: the Canadian contribution
Dr. Raymond Parker of the University of Toronto's Connaught Laboratories discovers a chemical nutrient in which cells can grow and replicate, playing a role in the discovery of the polio vaccine.

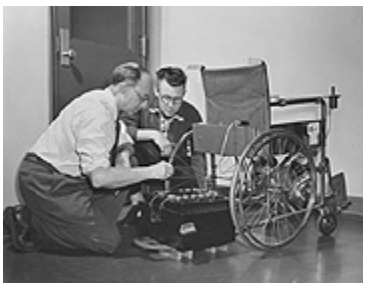
1946

Associate Committee is replaced by NRC Division of Medical Research.

Watching the body at work
Dr. Charles Leblond develops autoradiography. This technique is later used to identify stem cells in adult organs and observe the creation of proteins in living cells.

Return

1950s



"I have worked on many other projects. Some of them classified and important. But this one (the electric wheelchair) has given me the most satisfaction. It has given me a feeling of helping others, who have not always been able to help themselves."
George Klein

1951

Canada sets the pace for cardiac care
Dr. John Alexander "Jack" Hopps develops the world's first external 'cardiac pacemaker', which electrically stimulates heart muscles.

Blasting away cancer cells
The Cobalt-60 "Bomb", developed by Howard Johns at the University of Saskatchewan, represents a tremendous step forward in cancer radiation treatment. It is estimated to have saved millions of lives, and is still in use in some parts of the world today.

Recognizing strokes
Dr. C. M. Fisher discovers that strokes are often preceded by Transient Ischemic Attacks (TIAs) - brief episodes of impaired consciousness caused by blood clots in the arteries of the brain.

1952

Helping Those Who Can't Help Themselves
George Klein invents the world's first electric wheelchair for quadriplegic patients.

1956

Healing Hodgkin's disease
Dr. Vera Peters pioneers the use of radiation in the treatment of Hodgkin's disease. Once thought to be incurable, Hodgkin's now has a survival rate of more than 90%.

1959

Scientific serendipity
Drs. Robert Noble and Charles Thomas Beer discover that the plant extract vinblastine provides an effective treatment for cancer. The chemical remains an important component of chemotherapies used to treat Hodgkin's lymphoma and lung, breast and testicular cancer.

Return

1960s

"Obsolete containers. Inevitable poisonings. Day by day it rankles more and more, and more and yet more so, as our children are poisoned, and poisoned, and poisoned yet again. This is a deplorable, a disgraceful situation."
Dr. Henri Breault

Portrait courtesy of artist Irma Councill and The Canadian Medical Hall of Fame

1960

Medical Research Council is established as an autonomous body within NRC.

Repairing dislocated hips - ouch!
Dr. Robert Salter develops the "Salter Operation" for hip dislocation in children, a procedure still in use worldwide.

1961

Stem cells discovered
Drs. James E. Till and Ernest A. McCulloch discover the hemopoietic stem cell, the basis for bone marrow transplantation.

Treating osteoporosis
Dr. Harold Copp discovers calcitonin, a hormone that inhibits the release of calcium from the bones, used to treat osteoporosis, Paget's disease of bone and rheumatoid arthritis.

1967

Keeping little hands out
The first childproof medication cap, developed by Dr. Henri Breault, is adopted in Windsor, Ontario, reducing the incidence of childhood poisonings by 90%.

1968

Discovery saves babies' lives
Dr. Bruce Chown licenses Rh immunoglobulin, virtually eliminating Rh disease, which had claimed the lives of many babies whose blood was incompatible with their mothers' blood.

1969

Putting vitamin D in milk
Quebec starts adding vitamin D to milk, based on research by Dr. Charles Scriver; the incidence of rickets drops from 1 in 200 newborns to 1 in 20,000.

Parliament passes the Medical Research Council of Canada Act, creating the MRC as an autonomous crown corporation.

Return

1970s

"In research in health I think we can aspire to be the best. The health-care system is Canada's most cherished and valued program, and that ought to be linked to the very best research underpinning as a foundation."
Dr. Henry Friesen

1973

Trying on some new genes
Dr. Frank Graham co-develops a simple method of inserting extra copies of genes into mammalian cells. His research represents a big step forward in the development of cancer gene therapy.

1974

Why resist?
Dr. Victor Ling discovers P-glycoprotein, a protein that enables cancer cells to resist many drugs and helps protect brain cells from toxic substances.

Protecting young brains
Dr. Jean H. Dussault develops a simple and effective test for detecting hypothyroidism - the most common and preventable cause of mental retardation in newborns.

1975

The building blocks of blood groups
Dr. Raymond Lemieux synthesizes the sugar molecule found on the surface of type B blood cells. This research

leads to improved treatments for haemophilia and leukemia, as well as new antibiotics and anti-rejection drugs.

1977

Fighting infertility
Dr. Henry Friesen receives the Gairdner Foundation International Award for his discovery of a hormone called prolactin, which causes infertility in humans.

1978

MRC publishes Guidelines on Research Involving Human Subjects.

Return

1980s

"Don't be afraid to tackle science if you enjoy it."
Dr. Tak Mak

1980

Spinal cord nerves can regrow
Dr. Albert Aguayo does the seemingly impossible: he shows that damaged spinal cord nerves can regrow in animals if provided with the right environment.

1983

What makes our immune system work?
Dr. Tak Mak discovers T-cell receptors, a vital element of the immune system.

1984

Protecting animals in research
The Canadian Council on Animal Care develops guidelines to protect animals used in health research.

1985

Behave, cells!
Dr. Anthony Pawson of the Samuel Lunenfeld Research Institute discovers SH2 domain, the first prototype of protein domains involved in controlling cell behaviour.

1989

Cystic fibrosis gene found
Drs. Lap-Chee Tsui, Manuel Buchwald and Jack Riordan discover the gene that causes cystic fibrosis.

Striking back at HIV
Dr. Bernard Belleau develops lamivudine, a potent antiviral medication that later becomes an important component of HIV/AIDS treatment.

Return

1990s

"In research you really have to love and be committed to your work because things have more of a chance of going wrong than right. But when things go right, there is nothing more exciting."
Dr. Michael Smith

1992

What to do in the ER?
Dr. Ian Stiell develops the Ottawa Ankle Rules to help emergency room physicians make decisions on the spot, reducing wait times and costs; he goes on to develop similar rules for knee and neck injuries.

1993

Genes carry risk of Alzheimer's
Dr. Judes Poirier discovers that apolipoprotein E is a genetic risk factor for Alzheimer's disease.

The Canadian Nobel
Dr. Michael Smith wins the Nobel Prize in Chemistry for his discovery of a process called site-directed mutagenesis, which allows researchers to introduce specific mutations into genes.

1995

More Alzeimer's genes
Dr. Peter St George-Hyslop discovers and clones two genes, called presenilins, responsible for early-onset Alzheimer's disease.

1996

New ways to treat eye cancer
Dr. Brenda Gallie develops a new therapy for retinoblastoma, a cancer of the eye that leads to blindness; her work represents the first major change in managing the disease in 35 years.

1998

Four Clinical Research Chairs in Women's Health are created, the first such Chairs in Canada.

The Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans sets standards and procedures ensuring that all research involving humans is conducted according to the highest ethical standards.

1999

Islet cell transplants for diabetics
Drs. Ray Rajotte and James Shapiro carry out the first islet cell transplant (the Edmonton Protocol) in people with diabetes, with many patients remaining insulin-free three years later.

Preventing premature deaths
The HOPE Study, led by Dr. Salim Yusuf, is halted early after it finds that a drug called ramipril could prevent more than one million premature deaths, heart attacks and strokes each year.

Return

2000s

"If we succeed in sustaining and growing this exciting revolution in health research, if we succeed in striking creative global partnerships that will shape and harness this new science to improve health and health-care, and if we succeed in diminishing the disparities between those that have access to this new science and those that do not, then we will pass on a better world to our children."
Dr. Alan Bernstein, President
Canadian Institutes of Health Research

2000

Parliament passes the Canadian Institutes of Health Research Act, creating CIHR and transforming health research in Canada.

A shot against dementia?
Dr. Peter St George-Hyslop develops a vaccine that prevents Alzheimer's disease in mice and advances our understanding of dementia.

Early screening for a deadly disease
Dr. Jacques Drouin identifies a gene mutation responsible for severe hypoglycaemia in infants. His discovery leads to better screening for the disease and saved lives.

New leadership for Canadian health research
Dr. Alan Bernstein is named the inaugural president of CIHR.

CIHR takes shape
CIHR appoints a Scientific Director for each of its 13 "virtual" Institutes.

Return

2001

Simple blood test for heart disease
Dr. Benoît Lamarche discovers that people with high levels of C-reactive protein are at elevated risk of heart disease; a simple blood test could identify people at high risk.

Health and safety on the east coast
CIHR funds SafetyNet, the most extensive research of its kind into occupational health and safety in Atlantic Canada, led by Drs. Stephen Bornstein and Barbara Neis.

What's the best care?
Dr. Marcia Hills shows that integrated primary care is more cost-effective than physician-controlled health service delivery.

Mercury on the nerves
Dr. Fritz Lorscheider discovers that mercury destroys nerve cells and may lead to the development of Alzheimer's disease.

Return

2002

Stem cell research guidelines
CIHR introduces the Human Pluripotent Stem Cell Research: Guidelines for CIHR-Funded Research.

Training for the future
CIHR launches the Strategic Training Initiative in Health Research, funding 51 transdisciplinary research teams to train and support research talent.

How not to save $ on health-care
Drs. Leslie Roos, Raisa Deber and Evelyn Forget find that Medical Savings Accounts would not save money but result in an increase in spending on the healthiest members of the population.

Cardiac care
Dr. William Ghali finds that men and women are equally likely to receive cardiac treatment and that elderly patients are even more likely to benefit than younger ones.

Return

2003

SARS - unlocking the mysteries
Canadian researchers sequence the SARS genome in just 11 weeks, then develop three potential vaccines and a treatment within a matter of months.

Curing diabetes - in mice
Dr. Mickie Bhatia uses stem cells to trigger the growth of insulin-producing cells in the pancreas, effectively curing diabetes in mice.

Decoding life
A group of researchers lead by Dr. Stephen Scherer finishes sequencing chromosome 7 as part of the Human Genome Project, helping uncover the genetic roots of cystic fibrosis and other diseases.

Outsmarting problematic proteins
Dr. Neil Cashman and his colleagues identify antibodies that can be used to detect and defeat the misfolded proteins that cause Creutzfeldt-Jakob disease, the human equivalent of mad cow disease.

Taking on Grand Challenges
Drs. Peter Singer, Abdullah Daar and an international group of researchers partner with the Bill and Melinda Gates Foundation with the goal of eradicating the biggest health problems in the world, such as malaria and HIV/AIDS.

Return

2004

***E. coli* vaccine**
A vaccine for *E. coli* in cattle developed by Drs. Brett Finlay and Andy Potter proves successful and is marketed worldwide.

CIHR releases Investing in Canada's Future: CIHR's Blueprint for Health Research and Innovation, setting a national agenda for the future.

Being in hospital - bad for your health?
Drs. Ross Baker and Peter Norton's landmark study finds that 7.5% of people hospitalized in Canada experience an adverse event.

Heart disease around the world

Dr. Salim Yusuf studies 30,000 people in 52 countries and determines that, throughout the world, the same nine risk factors are responsible for 90% of heart disease.

Better heart attack care
Dr. Jack Tu and the Canadian Cardiovascular Outcomes Research Team find that as many as 400 lives could be saved each year in Ontario if more heart attack and heart failure patients received needed medications before leaving hospital.

Taking a stand on ethics
CIHR requires that all clinical trials it funds must register with an international registry of trials, ensuring that trials are transparent and accessible whatever their results.

Parliament passes legislation on assisted human reproduction, setting parameters for stem cell research in Canada.

Mental illness hits one in four
The Need to Know Team at the Manitoba Centre for Health Policy finds that one in four Manitobans had at least one mental illness diagnosis between 1997 and 2002, and issues a guide for regional health authorities to help them plan health care services.

Care for newborns
The Canadian Neonatal Network receives the CIHR Knowledge Translation Award for improving the quality of care and outcomes for newborns in Canada.

Return

2005

Learning about autism
Drs. Susan Bryson and Lonnie Zwaigenbaum develop the first Autism Observation Scale for Infants, helping identify autism in children as young as six months.

Colon cancer is in your genes
Dr. Jeremy Jass identifies a new hereditary form of colon cancer.

Deadly viruses
Drs. Heinz Feldmann and Steven Jones develop vaccines that can protect monkeys from lethal doses of the Ebola, Lassa and Marburg viruses.

No more pain
Drs. Yves De Koninck and Michael Salter discover that a protein called Brain-Derived Neurotropic Factor helps to relieve chronic nerve pain.

Silent but deadly
Dr. Vladimir Hachinski determines that 'silent' strokes can lead to dementia, including Alzheimer's disease.

Beauty and the beast
Dr. Wei Xiao discovers a pair of closely-related genes, Beauty and Beast, that may govern the development of cancer.

Setting benchmarks for wait-times
The federal and provincial governments make an historic announcement to establish wait-time benchmarks for cancer treatment, joint replacement and sight restoration; the agreement is based on wait-times research.

Return

2006

A sweet solution
Drs. Joanne McLaurin, Peter St George-Hyslop and David Westaway stop the build-up of toxic plaque in mice with Alzheimer's disease, essentially curing the disease, using a sugar-like substance known as scyllo-cyclohexanehexol.

Huntington disease - A cure?
Dr. Michael Hayden stops a mutant gene associated with Huntington disease (HD) from being split apart and, by doing so, prevents the degenerative symptoms normally created by HD.

Leukemia - Go away and don't come back
Dr. John Dick finds a way to destroy leukemia stem cells responsible for recurrence of the disease.

Am I DREAMing?
Drs. Hertzel Gerstein and Salim Yusuf complete the DREAM trial (Diabetes REduction Assessment with ramipril and rosiglitazone Medication) finding that rosiglitazone reduced the risk of developing Type 2 diabetes by 60%.

Healthy hearts
Dr. Jack Tu and the Canadian Cardiovascular Outcomes Research Team create a national Atlas of heart health, pinpointing regions where the disease is most widespread, the kind of care available and the associated outcomes.

Rx postal code
Dr. Steve Morgan produces the Canadian Rx Atlas, the first detailed picture of prescription drug use in communities across Canada.

Blockbuster deal
Vancouver-based Neuromed, a company built on fundamental research supported by CIHR, signs Canada's largest-ever licensing deal with industry giant Merck Inc., worth $475 million.

Return

2007

Stopping HIV
A groundbreaking study led by Dr. Stephen Moses shows that male circumcision can reduce the spread of HIV in young men. *Time* magazine ranks this finding the number one medical breakthrough of 2007.

Advances in MS research
A research team led by Dr. Alexandre Prat uncovers a mechanism used by white blood cells to attack the brain and the spinal cord in people with multiple sclerosis.

S.O.S. skin!
Dr. Freda Miller and her colleagues use skin-derived stem cells to repair spinal cord injuries in rats.

Old drug, new use
Dr. Evangelos Michelakis shows that dichloroacetate (DCA), an inexpensive drug used to treat metabolic disorders, can shrink cancer tumours.

My community, my rules
Canada's Aboriginal community and CIHR break new ground with the release of ethical guidelines that give Aboriginal people a greater say in how health research projects are conducted in their communities.

Take your vitamins mom!
Dr. Gideon Koren and his team discover that a pregnant woman can reduce her child's risk of developing three

common childhood cancers by taking prenatal vitamins containing folic acid before and during pregnancy.

Bye bye parasites
Research directed by Dr. Lakshmi Kotra leads to the discovery of a synthetic compound that binds to and inhibits a key enzyme the malaria parasite needs to reproduce and survive.

A new path to breast cancer treatment
Dr. Michel Tremblay and his research team discover that a new diabetes drug could slow - or even stop - the growth of breast cancer tumours by blocking an enzyme found in 40% of women with the disease.

Return

2008

A partnership to defeat Alzheimer's
CIHR signs an international co-operation agreement with the Institut national de la santé et de la recherche médicale (Inserm) and the Fonds de la recherche en santé du Québec (FRSQ) to fund research on the diagnosis, treatment and management of patients with Alzheimer's disease.

A better way to fix a broken heart
In a major clinical trial, Drs. Denis Roy and Mario Talajic discover that using drugs to control heart rate in heart failure patients is just as effective as the current, more invasive treatments, which involve electric shocks to control heart rhythm.

Tapping into nerve-muscle communication lines
Dr. Stefano Stifani uncovers a key mechanism involved in the development of motor neurons, improving our understanding of what goes wrong in neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS).

Reconsidering accepted practices
Drs. P. J. Devereaux and Homer Yang find that the common practice of giving beta-blockers to surgery patients increases risk of major stroke and death.

Body signals may help beat diabetes
Dr. Tony Lam discovers a new signalling pathway between the gut, the brain and the liver that lowers blood sugar when activated, creating the possibility of new treatments for people with diabetes.

Shutting down HIV production
Dr. Stephen Barr identifies a gene that blocks HIV from multiplying or spreading, raising the possibility of new treatments to prevent the onset of AIDS.

Return

2009

Decoding the breast cancer genome
Dr. Samuel Aparicio and Dr. Marco Marra decode the genome of a metastatic breast cancer tumour, showing that it is genetically distinct from its primary tumor, which arose nine years earlier. This work points to the need to target mutations present in metastatic disease.

Unmasking the herpes virus
Dr. Michel Desjardins and a team of Canadian and American researchers discover a mechanism by which the body's immune system can identify and attack the cold-sore-causing Type 1 herpes simplex virus (HSV-1), raising the possibility of a cure for this persistent pathogen.

Mixed signals

Dr. Jaideep Bains and his team discover that the part of the brain that controls stress, body temperature, hunger, moods and sex drive can misinterpret chemical "off" signals for "on". Understanding how to re-set this switch may hold the key to managing stress-related disorders.

Look for the same symptoms...
In a study of angioplasty patients, Dr. Martha Mackay finds that, contrary to popular belief, women are just as likely as men to experience classic heart attack symptoms. This finding could have important implications for the diagnosis and treatment of potential heart attack patients.

Drug combo reduces hospital visits
Dr. Amy Plint finds that a combined therapy of dexamethasone and epinephrine - previously used separately with limited results - significantly reduces hospital admissions for infants who arrive at emergency departments with a wheeze-inducing infection called bronchiolitis.

Diabetes drug could turbo-charge cancer therapies
Dr. Russell Jones and a Canada/U.S. research team discover that the diabetes drug metformin appears to make vaccines and cancer treatments more effective.

It's okay to delay
A study led by Dr. Shamir Mehta shows that delayed surgery for victims of mild heart attacks is as effective as immediate surgery, a finding that could have important implications for cardiac care.

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