

Fighting for Life: Cancer Research



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Research Prevents Cancer

Clinical trial to prevent breast cancer



Fiona Hodgson and her granddaughter, Julia

Breast cancer has certainly left its mark on the family of Fiona Hodgson, 71, a grandmother of two and part-time bookkeeper. Fiona's mother succumbed to the disease in 1960 at age 62, while her sister was taken four years later at just 35 years of age.

Naturally concerned about developing breast cancer herself, Fiona diligently performs self-exams and has annual physicals. In 1965 and twice in the 1970s – she found lumps that were biopsied, but they all proved to be benign.

Six years ago, Fiona was invited to join a new breast cancer prevention study, funded in part by the Canadian Cancer Society. This study is following a large group of post-menopausal women at increased risk of developing breast cancer to determine if a relatively new drug called exemestane (currently used to reduce recurrence of breast cancer) could help prevent it from starting in the first place.

The study results, which will be available in the near future, will have important implications for women at high risk of breast cancer and could offer a new, safe way to prevent the disease. The trial is led by the NCIC Clinical Trials Group (CTG), a world leader in conducting clinical trials that continue to improve how cancer is treated and managed. The CTG receives its core funding support from the Society.

"I'm thankful for the opportunity to be involved in leading edge research," Fiona says. "I hope that this research means that I never get breast cancer, and that future generations, including my own granddaughter, have another way of fighting this disease," she says, adding that being told everything's fine with her health is very reassuring, especially considering her family history.

Fiona says that she's happy to play a small part in helping advance cancer research. "If others can learn something from my involvement in the trial, it's all worthwhile!"



Dr Young-In Kim

Folic acid: friend *and* foe

Increased folic acid in our diets through supplements and fortified foods has brought many health benefits, such as prevention of some birth defects and other conditions. In laboratory research, Dr Young-In Kim, a University of Toronto researcher whose work has been funded by the Canadian Cancer Society, found that folic acid can even help prevent colorectal cancer (one of the most common cancers affecting Canadians), but only if it's taken before early pre-cancerous growths appear. "Adding folic acid to foods was a public health triumph with many benefits," says Dr Kim. "However, my team has discovered that there may also be unexpected, potentially serious, negative effects on cancer progression."

In fact, his recent research has shown that, while folic acid prevents colorectal cancer in healthy tissue, folic acid may actually promote growth of cancer in people with colorectal polyps. Since many people over 50 have polyps, Dr Kim's research suggests they should be cautious of supplemental folic acid.

"Since pre-cancerous polyps are so common, we should be careful about further fortification and supplementation," says Dr Kim. "Our research has shown that it may be good for some people but harmful for others."

Extinguishing cancer in the workplace

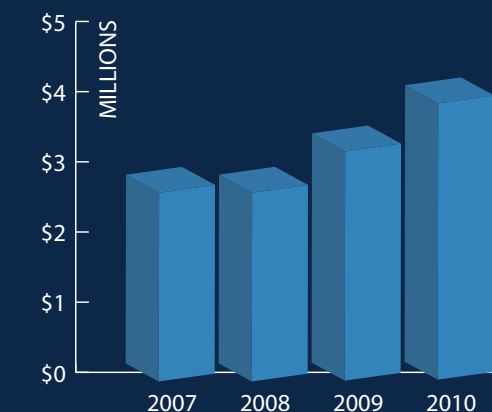
It's difficult to conclusively prove that harmful substances in the workplace cause cancer. But the Occupational Cancer Research Centre (OCRC) — jointly launched in 2009 by the Canadian Cancer Society, Cancer Care Ontario, the Workplace Safety and Insurance Board and the United Steelworkers — is up to the challenge.

Since hundreds of thousands of Ontarians may be exposed to cancer risks at work, the OCRC is conducting research into cancer risks — including various substances, radiation and even shiftwork — encountered while on the job. Ultimately, the research will lead to policies to protect people with high-risk jobs, like firefighter Ray Ellis. "I've lost quite a few 'brothers' to cancer," says the 24-year veteran of the Belleville Fire Department. "Because of smoke inhalation and exposure to toxic chemicals, I live with the fear of cancer virtually every day. I'm excited about how the OCRC will improve cancer prevention and education for people like me in higher-risk jobs."



Ray Ellis

SOCIETY INVESTMENT IN PREVENTION RESEARCH



The Canadian Cancer Society continues to increase its investment in cancer prevention research.

THE IMPACT OF OUR RESEARCH FUNDING

- People at high risk of developing a rare but deadly hereditary form of stomach cancer can now be screened and targeted for preventive treatment, thanks to over \$1 million in Society-funded research since 2004 by Dr David Huntsman in Vancouver.
- Dr Eduardo Franco of Montreal conducted preliminary research into the human papillomavirus with funding from the Society, which ultimately helped in the development of the HPV vaccine.
- More prominent warnings on cigarette packages deter smokers from lighting-up and encourage them to quit, according to an international study co-led by researchers from the Society-funded Propel Centre for Population Health Impact.

Research Saves Lives

See the difference a generation makes



Stephanie Hermsen and family

When Stephanie Hermsen was nine months old in 1976, her mother suddenly noticed a white spot in one of her eyes. Two days later, Stephanie was diagnosed with retinoblastoma – a rare form of eye cancer. Stephanie underwent nine months of radiation, chemotherapy and cryotherapy. Although treatment was successful in her left eye, in the end, her right eye could not be saved.

With advances in understanding retinoblastoma genetics and work by Canadian Cancer Society-funded researchers – Dr Brenda Gallie and Dr Helen Chan – a test that indicates the presence of the retinoblastoma-causing gene was developed. Stephanie was tested and told she carried the hereditary genetic mutation, with a 50/50 chance of passing the gene on to her children. After she and her husband, John, married in 2007 and decided to have a child, an amniocentesis confirmed that her growing baby carried the same mutation.

Baby Liam was delivered a month early to test for retinoblastoma, conducted by Dr Gallie. At four months, his first tumour appeared, but was eliminated with three rounds of laser surgery – a far cry from the lengthy treatment Stephanie had endured. A second tumour six months later in the other eye was also eradicated. Liam now has 20/20 vision, and both he and Stephanie are monitored to confirm they remain cancer-free.

Canadian Cancer Society-funded research has resulted in dramatic improvements in retinoblastoma treatment over the years. In the 1980s, Society-funded researchers discovered how to outsmart chemotherapy resistance in retinoblastoma cells, making treatment more effective, and continuing research into retinoblastoma genetics means that more children are diagnosed early, when it is easier to treat.

“With genetic testing, doctors can identify which kids are at risk, then monitor their eyes to see if the disease strikes,” Stephanie says. “Thanks to the incredible progress in retinoblastoma research made possible by Society funding, Liam won’t have to go through what I did. I’m much less scared of what the future holds for him.”

THE IMPACT OF OUR RESEARCH FUNDING

- Society-funded research — led by Dr Michael Taylor in Toronto — revealed in 2010 that a common type of childhood brain cancer called medulloblastoma is actually four different diseases, which could lead to more tailored therapies and spare some children from side effects of unnecessary treatment.
- As a result of more than \$1.4 million in Society funding since 2001, Dr Ming-Sound Tsao in Toronto identified a set of genes that can predict whether patients with early-stage non-small cell lung cancer will live longer if they have chemotherapy after surgery, sparing those who would not benefit.



Dr Paula Foster

Nanotechnology sets sights on roving rogue cells

Most cancer deaths are caused not by the initial tumour but by cancerous cells that break away and spread to healthy tissues elsewhere in the body and form new tumours, a process known as metastasis. If these ‘rogue’ cells could be tracked and new cancer sites

detected earlier, more lives could be saved.

Thanks to a \$253,000 three-year Canadian Cancer Society grant, Dr Paula Foster and her team at the University of Western Ontario are testing ‘targeted cellular imaging’ — an innovative technique that uses magnetic resonance imaging (MRI) to track cancer-binding nanoparticles (as small as one-millionth of a millimeter) as they travel around the body hunting down and sticking to cancer cells.

“With this advanced MRI technology, we can detect the presence, location and migration of even single cancer cells,” says Dr Foster. “With continued success of our research, in the future we will be able to detect metastasis earlier, making the new disease much easier to target and treat.”

Award-winning researcher bravely battles cancer

No one is immune from cancer, not even cancer researchers.

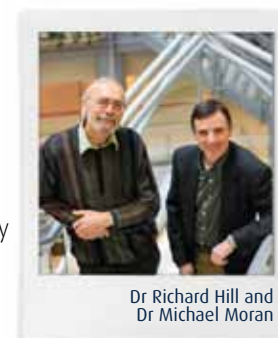
Since starting his Toronto-based laboratory in 1973, Dr Richard Hill, 68, has received Society funding that supports his research into the spread of cancer and radiation therapy. In 2007, Dr Hill’s research achievements were honoured with the Society’s prestigious Robert L. Noble Prize.

Only a year later, Dr Hill was diagnosed with multiple myeloma — an incurable cancer in which white blood cells in the bone marrow become abnormal and divide uncontrollably. After undergoing chemotherapy and a bone-marrow transplant, he was given thalidomide until he began to lose feeling in his fingers. Presently in remission, he says: “I’m getting on with my life and continuing to conduct research. There’s about a 50 per cent chance of recurrence within three years, but I am very hopeful that if my myeloma recurs, new drugs will be able to put it back into remission.”

Helping lead the fight against myeloma is Dr Michael Moran, 50, a Society-funded researcher in Toronto. He studies the cell signaling pathways that promote the growth, survival, and spread of multiple myeloma cells, with the goal of developing more effective drugs.

“As we learn more about myeloma and its different forms, we’ll have a larger arsenal of drugs to treat specific sub-types of the disease,” says Dr Moran, “and treatment outcomes should continue to improve.”

To read more, please visit www.cancer.ca.



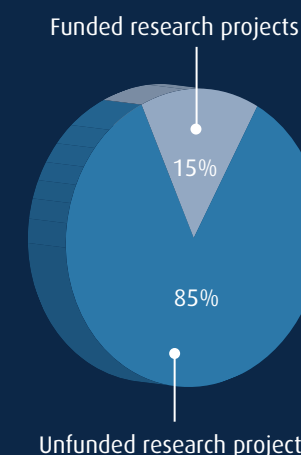
Dr Richard Hill and Dr Michael Moran

Thanks to progress in cancer research, 62 per cent of those diagnosed with cancer now survive, compared with only 25 per cent when the Society began funding research in the 1940s.

MAJORITY OF CANCER RESEARCH PROJECTS LEFT UNFUNDED

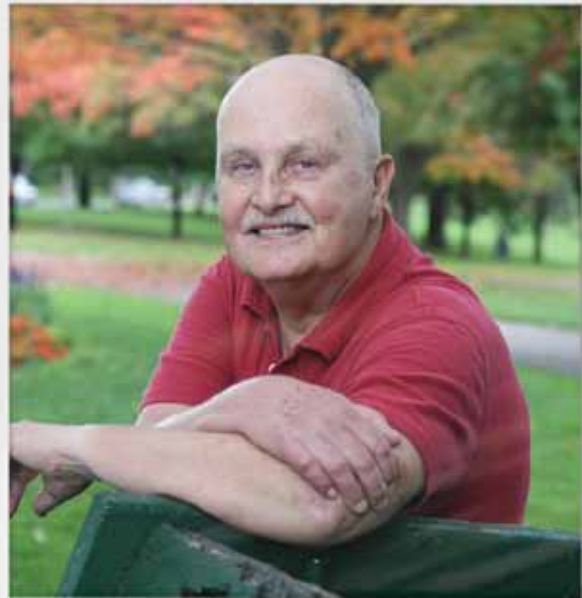
As the largest national charitable funder of cancer research in Canada, we support groundbreaking research aimed at preventing cancer, detecting cancers sooner, improving cancer treatments, and enhancing quality of life for those living with cancer.

Each year, the Canadian Cancer Society receives hundreds of peer-reviewed grant applications from leading research teams across Canada, but we’re able to fund only 15 per cent of them due to a lack of funds.



Research Enhances Quality of Life

Study explores side-effects of prostate cancer treatment



Paul Gauthier

Retired flight attendant Paul Gauthier, 68, has been courageously fighting prostate cancer since 1996.

Initially, Paul battled his cancer using radiation instead of chemotherapy, avoiding surgery and hormonal therapy because of the side-effects. But after his cancer recurred in 2003 and two rounds of innovative photodynamic therapy proved unsuccessful, Paul began hormone therapy in January 2007.

Testosterone, the hormone responsible for male characteristics, helps prostate cancer cells grow. Hormone therapy reduces testosterone levels, shrinking tumours and improving symptoms of disease. However, hormone therapy can also cause side-effects, such as decreased bone density, muscle strength and thinking abilities.

Soon after starting hormone therapy, Paul joined a Canadian Cancer Society-funded study, led by physician and researcher Dr Shabbir Alibhai, examining the impact of hormone therapy on quality of life.

Dr Alibhai is comparing various health measures for men undergoing hormone therapy versus those who are not. Early results suggest that men receiving hormone therapy began to lose arm strength and endurance after only three months.

“Men being offered hormone therapy need to think about the benefits and potential side-effects,” says Dr Alibhai. “Our results will help us better understand the effects of hormone therapy, enabling them to make more informed decisions. They also emphasize the importance of thinking early about ways to prevent potential side-effects.”

Despite its side-effects, hormone therapy has been an important means of keeping Paul’s cancer in check, allowing him to resume his busy life and even continue to travel.

“With the improvements and research being done, I see my prostate cancer as a manageable condition,” says Paul. “I don’t view it as a death sentence.”



Innovation to improve the journey through diagnosis

During a cancer diagnosis, patients and their families experience plenty of stress and uncertainty as they see many doctors and undergo numerous tests. With so many specialists involved, healthcare providers need to effectively coordinate and share diagnostic information with

each other *and* the patient to ensure the best possible outcome.

In partnership with Cancer Care Ontario, the Canadian Cancer Society is working to develop a first-of-its-kind tool called the Cancer Diagnosis Pathway Solution (CDPS) that will be piloted in 2011 for the diagnosis of lung and colorectal cancers.

CDPS will enable patients and doctors to review and share test results, keep track of appointments, learn about cancer and treatment options, and understand next steps — all in one place — helping reduce patient anxiety during an overwhelming time.

“This important tool, which will improve the experience of cancer patients across the province, would not be possible without the support of the Canadian Cancer Society,” says Dr Michael Sherar, Cancer Care Ontario.

Keeping teenage survivors coming back for care

Since watching her younger sister courageously battle against bone cancer, Leila Amin was inspired to help other young adults survive cancer.

Over 80 per cent of children with cancer survive, but many face medical and emotional issues for years afterwards, and require regular follow-up appointments so that any problems can be caught early. However, many teens stop seeking such care once they become adults. Currently an Occupational Therapist and a Master’s student, Leila is part of a Canadian Cancer Society-funded research team at McMaster University in Hamilton. She is working with adolescent cancer survivors to understand why they may not continue follow-up appointments, and learning how best to support them in adjusting to adult cancer care.

“If I can help doctors and clinicians better identify and support those youth at greatest risk of not attending their follow-up appointments,” says Leila, “it’ll help these survivors live healthier and happier lives — and I’ll be honouring my sister’s courageous fight against cancer.”



Leila Amin

The Society’s recent collaboration with the Pediatric Oncology Group of Ontario to establish the Pediatric Cancer Outcomes Initiative will lead to better outcomes and brighter futures for childhood cancer survivors.

Researchers funded by the Canadian Cancer Society are making a bigger scientific impact than other researchers in Canada.

A recent study found that the Canadian Cancer Society-funded researchers publish more papers and publish these papers in the most prestigious scientific journals.

THE IMPACT OF OUR RESEARCH FUNDING

- Early intervention by specialized palliative care teams improves symptom control and patient satisfaction, suggests research by Dr Camilla Zimmermann in Toronto that has been supported by \$825,000 in Society funding since 2006.
- A treatment program developed and tested by Dr Mark Katz in Toronto, made possible by more than \$360,000 in Society funding, will help oral cancer patients cope better with their disease and experience less emotional distress.
- Thanks to Society funding totalling more than \$300,000 from 2004 to 2007, University of Victoria nursing professor Dr Kelli Stajduhar has identified the factors that help predict which cancer patient caregivers might suffer burnout and require the support of additional health services.

More research is needed to finally defeat cancer

Thanks to the generosity of our donors and the tireless efforts of our volunteers and staff, the Canadian Cancer Society is leading the fight against cancer.

But there's much more research to be done. You can contribute to our efforts and help defeat cancer sooner by making a donation to the Canadian Cancer Society.

Please visit www.cancer.ca.

When you want to know more about cancer

- Visit our website at www.cancer.ca.
- Call our toll-free, bilingual *Cancer Information Service* at 1 888 939-3333.
- E-mail us at info@cis.cancer.ca.



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