Dr Gang Zheng is developing an innovative treatment for cancer. Find out more on page 10.
Fighting for Life

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Cancer by the Numbers

187,600 Canadians were diagnosed with cancer in 2013.

That’s 21 people every hour.

The most common cancers diagnosed in Canada are lung, breast, colorectal and prostate.

75,500 Canadians died of cancer in 2013.

About 1/2 of all cancer cases can be prevented through healthy living and policies that protect the public.

2 in 5 Canadians will develop cancer in their lifetime.

1 in 4 Canadians will die of cancer.

Today, more than 60% of Canadians diagnosed with cancer will survive compared to about 25% in the 1940s when we started funding research.
Tyler Cook, a 32-year-old husband and father in Sudbury, owes his life to Canadian Cancer Society-funded research. Tyler’s mother died at 35 from stomach cancer in 1991, and in 2007 his oldest sister, Jennifer, was diagnosed with advanced stomach cancer at 31. “A doctor suggested the stomach cancer could be genetic. After Jennifer passed away, they did some testing and found a mutation,” says Tyler.

Dr David Huntsman, a researcher at the British Columbia Cancer Agency, had just developed the DNA-based blood test that identifies the genetic cause of hereditary diffuse stomach cancer, which is often diagnosed at very late stages when it is not treatable. With funding from the Canadian Cancer Society, Dr Huntsman studied over 80 families with the disease and discovered a number of genetic mutations that greatly increased their risk. Those individuals who are found to carry a mutation have the option of surgery to remove their stomach, a drastic step that reduces their chances of dying from the disease from 70 per cent to less than one per cent.

Tyler and his sister Shelley chose to be tested and both carried a mutation, as did other extended family members. “After seeing what my mother and sister went through, deciding to have the surgery was a no-brainer,” says Tyler. He had the surgery nearly four years ago, and doctors detected several small tumours in his stomach tissue, as they did with Shelley. “We’re so thankful. We both know that we wouldn’t be here today if we hadn’t had the genetic test and the surgery.”

Today, the test Dr Huntsman developed is used nationally and internationally. “Stomach removal has already proved successful in preventing stomach cancer in more than 100 people with the genetic mutations. It’s inspiring to meet these courageous families and see how our research is helping them deal with a disease that’s been a source of dread for generations,” says Dr Huntsman.

Tyler has adjusted well to life after having his stomach removed. “It turned out better than I expected. I eat smaller portions, about five or six times a day, and my life is pretty much back to normal,” says Tyler, who now volunteers with the Canadian Cancer Society. “This research saved my life and my sister’s life. Without it, stomach cancer would have wiped out most of our family.”
For women trying to quit smoking, the fear that they will gain weight once they stop smoking is one barrier to success. With Canadian Cancer Society funding, Dr Harry Prapavessis and his team at Western University have been leading a clinical trial to study whether exercise can help women stay smoke-free.

In an earlier study, Dr Prapavessis showed that a supervised exercise program, with nicotine replacement therapy (NRT), helped women quit smoking, improve fitness and minimize weight gain. A common problem, however, is that after the organized exercise program ends, many stop exercising and resume smoking.

Dr Prapavessis is leading the first clinical trial to test whether a home-based exercise maintenance program is effective in helping women remain smoke-free. In the trial, 413 women who were trying to quit smoking – some of whom were recruited through the Society’s Smokers’ Helpline – followed a 14-week supervised exercise and NRT program; afterwards, half the group also received counselling to maintain regular exercise on their own.

Preliminary results show that at 14 weeks over 50 per cent of the women were smoke-free and improved their health, with one-year results expected in 2014. “We hope that women who received additional training have lower smoking relapse levels, maintain their fitness levels and gain less weight than those who didn’t receive training,” says PhD candidate Stefanie De Jesus, noting that even 10 minutes of brisk walking a day can reduce cravings and nicotine withdrawal symptoms.

The benefits extend beyond their physical health. “Some women are so motivated to continue pursuing physical activity that they get involved in obstacle course races. Their self-esteem and confidence in tackling any goal increases dramatically,” says De Jesus.

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Heidi Hayes, 15, a former child actor and avid athlete from Orillia, was only nine when she was diagnosed with acute lymphoblastic leukemia (ALL), which has a high survival rate but also many side effects from treatment. During her two and a half years of chemotherapy, which kills cancer cells but damages the immune system, Heidi had serious infections and was taken to hospital many times.

This energetic, enthusiastic teen struggled with mood swings, sudden weight gain and other side effects from the heavy-duty steroids that were part of her treatment. “I had temper tantrums because my mom wouldn’t get me cheese pizza. I would gain five to seven pounds every time I was on steroids for a five-day period,” recalls Heidi.

For many children with cancer, side effects and complications from treatment are serious problems. For example, more than 70 per cent of kids with acute myeloid leukemia (AML) get severe infections and five to 10 per cent die from complications of their treatment, not the cancer. Dr Lillian Sung, a pediatric oncologist at the Hospital for Sick Children, is looking for ways to reduce the high risk of complications. She led a recent Canadian Cancer Society-funded study showing that corticosteroids, which may be included in treatment to help prevent side effects or improve chemotherapy, may also increase the risk of infection in children with AML.

“Physicians often don’t need to use steroids and when possible they should avoid using them,” says Dr Sung, noting that some guidelines now discourage corticosteroid use in children with AML to reduce toxicity and side effects. These new findings should lead to clinical practice changes.

With Society support, Dr Sung is also looking for differences in immune system genes that make some kids with AML more prone to serious infections. “If we can identify which children are more susceptible, we can target treatment to reduce their infection risk and prevent some kids from dying,” says Dr Sung.

Now involved with the Canadian Cancer Society’s Relay For Life fundraising event, Heidi has spoken across the region in support of more research to reduce the harmful side effects of treatment for childhood cancers. “It’s exciting for me to see the research that’s trying to fix what I went through,” she says.

“I would gain five to seven pounds every time I was on steroids for a five-day period.”

Heidi Hayes, childhood leukemia survivor, Orillia
Dr Lillian Sung, oncologist and researcher, Hospital for Sick Children, Toronto

Who

A Society-funded study is looking for ways to reduce the risk of severe infections that may occur as side effects of treatment for childhood leukemia.

What

Since infection and other side effects can be devastating, managing the side effects of cancer treatment is often just as important as treating the cancer.

Why
Beacon of hope for cancer patients

An explosion of new knowledge and technology is allowing researchers to develop new kinds of drugs that selectively target tumour cells.

With the Bill and Kathleen Troost Innovation Grant of the Canadian Cancer Society, Dr Gang Zheng and his team at the Ontario Cancer Institute are developing an innovative treatment for spinal metastases, the spread of cancer to the spinal cord. These metastases affect many advanced breast cancer patients and can cause severe pain and paralysis. Their treatment uses light and light-activated drugs to kill cancer cells that have spread to the spinal cord with pinpoint precision.

Dr Zheng has invented a “smart drug” or beacon, which is delivered to cancerous and non-cancerous cells, but is only switched on by a specific cancer cell molecule. Light is then used to activate the drug, releasing toxins that destroy cancer cells. Any drug that reaches healthy tissue will not activate and become toxic. Destroying these tumours makes room for injections of special cement that strengthens the spinal cord.

“You can give the optimal dose to shrink the cancer without worrying about harming healthy tissue. This has the potential to increase survival and improve the quality of life for these patients,” says Dr Zheng. Early results have shown that this smart drug is effective in selectively killing harmful cells.

Dr Zheng’s beacons may also be applied to other cancers, such as brain, and head and neck cancers, where laser-like precision during surgery is essential to preserve vital tissues. “The surgeon can only cut so much. The beacons allow treatment to be more specific and sweep out residual cancer cells, which can reduce the recurrence of cancer,” he says.

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After a biopsy of a lump in her throat at age 19, Paula Cecchetto was first diagnosed with terminal thyroid cancer and given about three months to live. Doctors soon realized that she actually had Hodgkin lymphoma, and she was successfully treated with chemotherapy, followed by 20 rounds of radiation on her throat, neck and chest.

“The diagnosis of Hodgkin lymphoma was a relief since survival rates are high,” says Paula, a 47-year-old Ottawa-based working mother of two. “But 28 years later, I’m living with the side effects resulting from the treatment.” She had a benign tumour removed from her vocal chord and developed skin cancer on her neck and shoulder. Then, three years ago, precancerous cells were detected in her breast. Paula knew that if she developed breast cancer, she wouldn’t be able to have radiation because she had already received it to treat the Hodgkin lymphoma. Based on her high risk, she had a double mastectomy and reconstructive surgery.

“I’m thankful that both surgeries went well and I avoided having to deal with a breast cancer diagnosis,” says Paula.

A long-term clinical trial, supported by the Canadian Cancer Society, recently showed how treatment for some patients with Hodgkin lymphoma can be improved. Study results demonstrated that those treated with chemotherapy alone lived longer than those treated with chemotherapy and radiation, largely because they didn’t have long-term effects from radiation, such as secondary cancers and heart disease.

“Our trial, which followed patients for 17 years, showed that chemotherapy had fewer long-term side effects and was better than the standard treatment used previously, which included extensive radiation,” says Dr Ralph Meyer, the lead researcher on the trial. “Hodgkin lymphoma is a disease of younger patients and it’s highly curable, so where the patient is going to be in 30 years really matters.”

Paula is now helping other people living with cancer as a volunteer with the Society’s peer support program and passionately believes in the importance of research focused on reducing cancer treatment side effects. “There is a huge need for more research on quality of life issues for survivors. A study like this means some patients can avoid radiation, and that will allow more people to live a healthy life after treatment,” she says.
Healing the cracks in care

A photograph of a crack that goes down into an elevator shaft was taken by Sandra, a First Nations cancer survivor, to convey her experience of feeling invisible and falling into the cracks in the health care system. Many First Nations women who survive cancer face the challenges of socioeconomic inequality, isolation and cultural insensitivity to traditional beliefs in healing.

With the Quality of Life Grant of the Canadian Cancer Society in memory of Edna Goebel, Dr Roanne Thomas and her research team are building on a pilot study documenting the experiences of women like Sandra. Their national study will evaluate whether the process of photography, interviews and journaling helps to enhance well-being for First Nations, Inuit and Métis women with cancer. The team will also look at how making participants’ experiences visible can be empowering and supportive. The research is being completed in partnership with Saint Elizabeth Health Care, a home and community-based health care organization with links to over 350 First Nations, Inuit and Métis communities across Canada.

“This study gives women from diverse, marginalized communities an opportunity to document their experiences in an expressive and meaningful way, and share those experiences with other cancer survivors and health professionals,” says Dr Thomas. “We’ve seen incredible strength and creativity in these women.”

The findings and a resulting video will be used to increase awareness and improve understanding about the women’s experiences among their communities and health professionals. “Our goal is to improve knowledge of cancer from the perspectives of women in diverse Canadian communities, in order to provide a strong foundation for culturally responsive practices, programs and policies,” says Dr Thomas.

Who
Dr Roanne Thomas and Dr Wendy Gifford, researchers, University of Ottawa. Dr Thomas is a recipient of the Quality of Life Grant of the Canadian Cancer Society in memory of Edna Goebel.

What
A national study using photography, journaling and group discussions will explore First Nations, Inuit and Métis women’s experiences with cancer.

Why
An understanding of the women’s experiences could enhance well-being and improve health care.
More research is needed to defeat cancer

Thanks to the generosity of our donors and the tireless efforts of our volunteers, the Society leads the way in the fight against cancer. But there is more to be done.

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