NEW HOPE FOR STAGE 3 LUNG CANCER PATIENTS ... P3

NATIONAL POST, WEDNESDAY, SEPTEMBER 26, 2018

Personalized medicine is breathing new life into the approach to treat cancer patients. GETTY IMAGES

NP
nationalpost.com

Advances in oncology offer new options

NAVNEET ALANG
Postmedia Content Works

There are few statistics at once as shocking and humbling as the fact that nearly 50 per cent of Canadians will be diagnosed with cancer at some point in their lives. More stark still is that half of those diagnosed will eventually succumb to the disease.

Things are not all doom and gloom, however. Certain malignancies — colon, prostate, some forms of breast cancer — have seen significant improvements in outcome over the past few decades.

Yet as those who have suffered through cancer sometimes say, ruefully, treatment has historically been limited to three options: cut, burn, or poison. When the first option of surgery becomes impossible, the only remaining two choices are radiation and chemotherapy, both of which may effectively attack the cancer cells but can impact healthy cells, too.

But a recent shift toward something called personalized medicine may promise a new reason for hope by turning treatment into something altogether more laser-like in its focus. What may be particularly fruitful is the treatment of those diseases like lung cancer or advanced melanoma, which are, unfortunately, both stubborn and stubbornly common, and have seen little change in survival rates.

Personalized cancer care generally falls into two main types: immunotherapy and targeted therapy. The goal of each is the same, however: to approach cancer by tailoring treatment to the uniqueness of each patient's disease and biology.

As the name suggests, immunotherapy uses the body's own immune system to fight cancer. When a cancerous tumour emerges in someone, it's because the body's usual mechanisms that regulate cell growth and death, or remove foreign objects, stop working, usually due to a genetic mutation. What immunotherapy does is either boost the body's own immune system to attack cancer cells, or direct it to attack very specific markers on only cancer cells.

Targeted therapy works in a similar manner, but instead uses specific drugs meant to focus on some unique aspect of a patient's cancer. Targeted treatments can identify specific genes or proteins only found on cancer cells, helping to stop or slow cancer growth.

The benefits of such approaches are clear: treatment primarily attacks the cancer, mitigating the situation where an already sick person is made weaker and worse by chemotherapy. The results are also showing some promise. One recent trial reported survival times nearly doubled for patients with non-small cell lung cancer who were treated with immunotherapy in addition to chemotherapy, versus just chemotherapy alone.

More developments are on the horizon. CAR-T therapy, for example, is a form of immunotherapy in which the patient's own immune cells are extracted and modified in a way that allows them to recognize and kill cancer cells. These engineered immune cells are then multiplied before infusing them back into the body to find and attack the cancer.

Thus far it has shown promise in treating blood cancers, and points to the personalized direction of new treatments.

We often talk about cancer as if it is a single disease, leading us to also hope for a "cure for cancer."

The truth is more difficult. Cancer is instead thousands of different diseases, each with its own needs and circumstances.

The future of treatment will not be in trying to find one solution to all of these many situations but, instead, to make cancer care more personalized — and with that, provide hope for millions.

THIS SECTION WAS CREATED BY CONTENT WORKS, POSTMEDIA'S COMMERCIAL CONTENT DIVISION.

> CAR-T THERAPY WAS INSTRUMENTAL IN GRABBING HIM FROM DEATH'S DOOR AND GIVING HIM A REGULAR LIFE. IN MY MIND, IT IS THE BEST MEDICAL ADVANCEMENT SINCE PENICILLIN. IT IS TAKING THESE KIDS AND THESE FAMILIES WHO HAVE ALMOST LOST ALL HOPE AND LITERALLY GIVING THEM A CHANCE AT A CURE. — DEBBIE DEAN LAHTI, MOTHER OF CANCER SURVIVOR CAMERON

CAR-T therapy, now undergoing clinical trials in Canada, has been instrumental in helping patients survive cancer. *GETTY IMAGES*

CAR-T cell treatment gives Ontario boy a chance at a 'regular life'

HEIDI WESTFIELD
Postmedia Content Works

Debbie Dean Lahti wasn't sure she would ever see her son in such good health. Cameron has been in and out of hospitals most of his life. He has undergone chemotherapy treatments for leukemia, only to face more needles, radiation and infusions when the cancer reappeared. Now she is watching, amazed and grateful, as he reaches milestone after milestone. First it was six months in remission, then a year, then two years without any signs of the cancer returning.

She attributes Cameron's remission to a new cancer treatment called chimeric antigen receptor T-cell therapy (CAR-T). In 2016, the Newmarket, Ont. family moved to Philadelphia for six weeks so her son could take part in what was then an experimental clinical trial. While she was nervous at first about enrolling her son in the trial — there were so many unknowns — she is confident it was the right choice.

"I believe we made the absolute best decision," Lahti says. "It was instrumental in grabbing him from death's door and giving him a regular life. In my mind, it is the best medical advancement since penicillin. It is taking these kids and these families who have almost lost all hope and literally giving them a chance at a cure."

The remarkable improvements seen in Cameron's condition, and other children diagnosed with relapsed leukemia, has thrust CAR-T therapy into the spotlight. CAR-T therapy is not a traditional cancer drug. It is a personalized treatment that works by modifying a patient's immune cells in a way that they can recognize and kill cancer cells. Health Canada approved the first CAR-T cell therapy for use in Canada, Kymriah, in early September.

Cameron was diagnosed with acute lymphoblastic leukemia (ALL) in 2010, just shy of his fourth birthday. It is the most common form of childhood cancer in Canada. After a first three-year cycle of chemotherapy, the cancer came back. Cameron began a second and more intense round of chemotherapy but it was also proving ineffective. After another relapse, the family met with his medical team in 2016 at The Hospital for Sick Children (Sick Kids). The mood in the room was more sombre than it had been in the past.

"When they came into the room to discuss Cameron's situation it was pretty grim," she recalls. "You could tell by their faces that the prognosis was not a very positive one. We knew by their expressions that this was far more serious than anything before."

> USING YOUR OWN BODY TO FIGHT DISEASES IS GOING TO BE THE FUTURE

Doctors outlined the two best options still available: a bone marrow transplant, or a CAR-T clinical trial at Children's Hospital in Philadelphia. The doctors were leaning towards the trial, but there was no guarantee Cameron would get in. He had blood and skin infections, and his immune system was very weak. Years of chemotherapy had interrupted the production of his T-cells. Cameron's treatments needed to be modified so his body could make them again.

"It came to the point where he finally had the bare minimum of T-cells to qualify. He went onto a machine, similar to a dialysis machine, that takes the T-cells from his blood. The cells were then shipped to Philadelphia, to see if they could be modified."

The idea of rewiring a body's own cells to fight cancer used to be something out of science fiction. Now labs across North America and around the world are conducting hundreds of CAR-T therapy clinical trials. There are hopes advances in immunotherapy will lead to a new era of cancer medicine.

"There is a lot of optimism going forward of what this therapy already can do, and what this therapy may be capable of in the future," says Dr. Joerg Krueger, a hematopoietic stem cell transplant and cellular therapy specialist at Sick Kids. "I am as encouraged and impressed as everybody else."

Dr. Krueger cautions, though, that CAR-T therapy has notable limitations. It has been shown to work most effectively with a very small pool of cancer patients with certain types of blood cancers. There are also side effects, and patients can become very sick during treatment. In some cases, he says, CAR-T cells can't be successfully manufactured or the treatment doesn't stop the cancer from returning. There is also the question of cost; personalized therapies can potentially cost in the hundreds of thousands of dollars.

Against the odds, Cameron qualified for the CAR-T trial. The 10-year old arrived in Philadelphia in a wheelchair to begin treatment. While he experienced some side effects, they were mild. Three months after his T-Cell therapy began, Cameron was strong enough to walk on his own. That October, he signed up for his school's cross-country run. It was a day his family will never forget.

"Cameron was by far the last-place runner, but we had kids and teachers from all these different schools and everybody knew Cameron's name and they all cheered him along to the finish line," Lahti recalls. "We were going from a worst-case scenario to watching your child cross the finish line. To go from death's door to cross-country running in a matter of months is such a miracle."

There are still many unanswered questions, but Cameron's mother is a believer. She is one of an increasing number of parents, scientists and doctors who believe CAR-T cell therapy has the potential to transform cancer medicine.

"Using your own body to fight diseases is going to be the future," Lahti predicts. "Not just for children, but for everybody."

NNPSA118932_1_1

“WE HAVE SEEN A DRAMATIC INCREASE IN CASES WHERE THE CANCER IS NO LONGER GROWING. WHEREAS BEFORE, CHEMO AND RADIATION CURED STAGE 3 LUNG CANCER IN ABOUT 20 PERCENT OF PATIENTS, BASED ON WHAT WE ARE SEEING FROM THE INITIAL NUMBERS THAT MIGHT BE PUSHED TO 50 PER CENT WITH THE ADDITION OF IMMUNO-THERAPY. THAT REPRESENTS THE FIRST SIGNIFICANT INCREASE SINCE THE EARLY 1990S. — DR. MARK VINCENT

New treatment options such as immunotherapies have given many stage 3 cancer patients a new lease on life.. *GETTY IMAGES*

Research brings new hope for stage 3 lung cancer patients

DENISE DEVEAU
Postmedia Content Works

Improving the treatment of lung cancer has long been a high priority area for cancer research efforts. Not only is lung cancer one of the most commonly diagnosed cancers in Canada, it is also the leading cause of death from cancer in men and women.

According to the Canadian Cancer Society, in 2017 there were 28,600 new diagnoses of lung cancer — and an estimated 21,100 people died of lung cancer that same year. That means more than 25 per cent of people who died of cancer in 2017 died from lung cancer. The most common of lung cancers is ‘non-small cell,’ which typically starts in a different part of the cells in the lung and accounts for about 85 per cent of cases.

Approximately 30 per cent of people diagnosed with lung cancer have what is referred to as stage 3, at which point the cancer has spread beyond the lungs and into the chest.

Stage 3 lung cancer is one of the most complicated types to treat, and available treatments have met with limited success over the years, says Dr. Mark Vincent, a London, Ont.-based oncologist.

The major challenge with lung cancer is that it often doesn’t present symptoms until it has reached a stage where it has become surgically incurable, Dr. Vincent explains. “At that stage it tends to spread quite quickly and be very aggressive.”

Often, symptoms such as a persistent cough don’t immediately point to cancer, delaying the diagnosis to the point where the patient is beyond early intervention or surgery, he explains. “That’s why patients, especially at-risk patients such as smokers, should push for a chest x-ray quickly. If you can pick up the disease at an earlier stage, sometimes it can be cured.”

An added factor is that lung cancer is often found in elderly patients suffering from multiple diagnoses. “While young people can get lung cancer, it’s generally people in their 60s and 70s,” Dr. Vincent notes.

In stage 3, there are conventional treatments that have been applied for a number of years, such as focused radiation and chemotherapy. These treatments are given with the intent to cure the cancer — but in the majority of patients who benefit from this treatment, up to 70 per cent, their cancer will spread further. Despite numerous research efforts, these numbers have stayed the same for about the last 30 years.

In recent years however, the odds for certain lung cancer patients have improved with the advent of molecularly targeted and immunotherapies. Thanks to these breakthroughs, Dr. Vincent says, “the diagnosis today is not quite as gloomy as it was before.”

These newer therapies work differently in the battle against cancer. Molecularly targeted therapies block the growth of cancer cells by specifically targeting the molecules that cause tumour growth in certain types of cancers, while immunotherapy drugs work by triggering a person’s immune system to recognize abnormal activity and direct the system to attack the tumour cells.

“What immunotherapy does in simple terms is wake up your immune system to tell it something is growing in the body that has changed and directs it to switch off the cells that cause the cancer to spread,” Dr. Vincent explains.

With these added therapies, treating stage 3 lung cancer patients typically involves a combination of approaches, he notes. He likens the process of combining immunotherapy with chemotherapy, for example, as one which “smashes the tumour up. This releases antigens that then boost the immune system, like a vaccine. That’s why it can be effective in stage 3 lung cancer, because the release of antigens alerts the the immune system and gives it a big boost.”

The question facing us now is which patients can benefit from treatment solely with immunotherapy or molecularly targeted drugs, and which patients will need these treatments integrated with chemotherapy and/or radiation. “The decision in large part is related to the type of mutation of the cancer cells. In some cases, all of these may be used in first line treatment.” The standard of care has changed from just chemotherapy and radiation to chemo and radiation followed by immuno therapy.

Early research into the impact of these newer therapies has shown that survival rates in stage 3 and 4 are improving for the first time in years, Dr. Vincent says. “We have seen a dramatic increase in cases where the cancer is no longer growing. Whereas before, chemo and radiation cured stage 3 lung cancer in about 20 per cent of patients, based on what we are seeing from the initial numbers that might be pushed to 50 per cent with the addition of immuno therapy. That represents the first significant increase since the early 1990s.

“This is a big thing in our world of research,” he adds. “Now we are able to focus on figuring out how to make these therapies apply to everybody, not just the minority.”

NNPSA118876_1_1

> THERE HAVE BEEN HUGE CHANGES IN THE TREATMENT OF LUNG CANCER WITH THE INTRODUCTION OF IMMUNOTHERAPIES TWO YEARS AGO. SO MUCH SO THAT IT HAS SPAWNED A NEW TERM IN THE MEDICAL COMMUNITY: IMMUNO ONCOLOGY.
> — DR. BARBARA MELOSKY, MEDICAL ONCOLOGIST, BC CANCER

Immunotherapy clinical trials break new ground in lung cancer treatment

DENISE DEVEAU
Postmedia Content Works

For years, treatments for lung cancer have shown limited progress compared to higher profile breakthroughs in breast and prostate cancer. But that is no longer the case, as a new class of cancer therapies have broken down barriers, delivering extremely promising results in a number of clinical trials.

For years, the prevailing survival rate for stage 3 and 4 lung cancer patients stood at two to 24 per cent. Finally, that statistic is now outdated, says Dr. Barbara Melosky, medical oncologist with BC Cancer — Vancouver site.

"There have been huge changes in the treatment of lung cancer with the introduction of immunotherapies two years ago," she says. "So much so that it has spawned a new term in the medical community: immuno oncology."

One main area of focus for immunotherapy clinical trials has been non-small cell lung cancer which accounts for 80 per cent of all lung cancer diagnoses; one third of those are diagnosed with stage 3 lung cancer. At that stage the cancer has spread to the middle of the chest, and in most cases, an operation will not change the chances for survival. Typical treatment approaches to date include radiation, chemotherapy and targeted therapies. In stage 4, the cancer has moved beyond the lungs and metastasised to other organs.

Immunotherapies work differently from chemotherapy or targeted therapies, both of which focus on attacking cancer tumours. Classified as checkpoint inhibitors, immunotherapy drugs are designed to "wake up" your immune system. "When you receive the drug it doesn't go to the cancer. It triggers your body to fight your own cancer," Dr. Melosky explains. Each immunotherapy drug is developed to address specific mutations, of which there are several in stage 3 and 4 lung cancer.

Initial immunotherapy clinical trials were focused on melanoma. Lung cancer became the second area that began to show the benefits to be gained from immunotherapy drugs starting with stage 4 patients. "In stage 4 cases, immunotherapy is now being used as a standard of care as either a first-line treatment or following chemotherapy, depending on the classification," Dr. Melosky says.

Stage 3 non-small cell lung cancer for its part presents a more complicated challenge for oncologists in terms of diagnosis and treatment. While the typical approach has been radiation or chemotherapy, according to Dr. Melosky, "We have been doing that for 20 years and it has not made any significant gains in terms of longer term survival rates."

New cancer therapies give patients, physicians and researchers new optimism. *GETTY IMAGES*

She says stage 3 cancer, "is very, very complex in terms of staging changes every year. We have to look at the tumour size, the lymph nodes involved and the locations. There is a huge number of groups to determine, making it one of the hardest areas of cancer to teach medical students and treat effectively."

Dr. Melosky stresses that in treating stage 3 lung cancer, the end point is not a cure but stopping the progression of tumours in order to extend the patients' survival rate. "We refer to that as living without progression."

Within the past year alone, there have been some significant results emerging from stage 3 clinical trials, she adds. "We're absolutely seeing some great numbers coming in. In one trial, the progression for survival (i.e. when the cancer grows again after treatment) was 16.8 months — which translates into 11 months longer versus patients not receiving immunotherapy treatment. Another stage 4 trial reported a 30-month improvement in overall survival."

As clinical trials continue to produce meaningful data for the medical community, Dr. Melosky says this is only the beginning for immunotherapy drugs in treating mid- to late-stage lung cancers.

Currently there are two treatments in use, with expectations that another two will be introduced shortly. "We will soon have four to choose from, with more to follow as the clinical trials are completed. Each new drug opens the door to even more opportunities for patients," Dr. Melosky says.

As clinical trials pick up the pace, it is finally time to feel some optimism around lung cancer, she believes. "At one point, many patients with lung cancer didn't get into the door because they were simply too ill to be treated. Now many more of them can be.

"The world of lung cancer has changed dramatically," she adds. "Lung cancer used to be a field young oncologists didn't want to pursue. With immunotherapy drug treatments, more lung cancer patients are living longer. I'm busier than ever, which is a fantastic thing because that means more patients can be treated. There is simply no room for nihilism anymore."

Immunotherapies newest pillar in treating stage 3 lung cancer patients

DENISE DEVEAU
Postmedia Content Works

Recently, multiple immunotherapies have been approved for the treatment of advanced incurable stage 4 non-small cell lung cancer (NSCLC). The most recent announcement was the approval for the treatment of stage 3 NSCLC in May of this year.

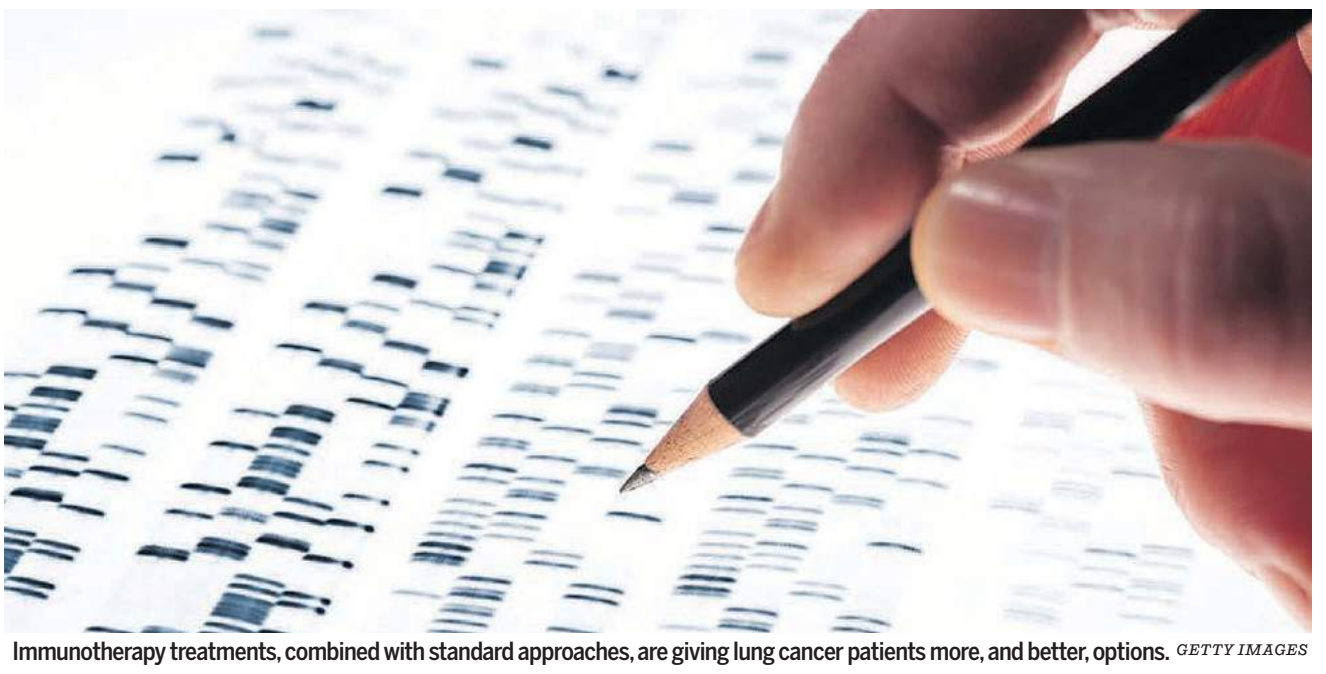
These approvals represent a significant turning point in cancer treatment, bringing new hope to stage 3 patients for the first time in years.

According to Dr. Parneet Cheema, medical oncologist at William Osler Health System, a majority of patients with NSCLC will present with advanced stage disease (including stage 3 and 4). Up to 30 per cent of all patients diagnosed with NSCLC will present with stage 3 disease.

A key challenge is that in many cases, symptoms only present themselves in the later stages of the disease or are often mistaken for other common illnesses. Once patients present with a stage 3 NSCLC, the cancer may be too widespread to allow for surgery, and treatment options for stage 3 NSCLC patients who cannot have surgery are typically limited to radiation and/or chemotherapy, if they can be tolerated.

The key difference for unresectable stage 3 NSCLC is that this is a potentially curable situation, unlike stage 4 disease, where treatments are geared towards stabilizing the cancer for longer and maintaining quality of life.

Despite all these advancements in NSCLC, there continues to be a common misconception that there are no effective treatments for lung cancer, or that the only treatment is chemotherapy. "With immunotherapy, there are now treatments available that extend the life expectancy of non-small-cell lung cancer patients' lives with stage 4 disease and maintain their quality of life, and now these therapies are available for stage 3 disease as well, after they have completed their chemotherapy and radiation treatment," Dr. Cheema says.



Immunotherapy treatments, combined with standard approaches, are giving lung cancer patients more, and better, options. *GETTY IMAGES*

Immunotherapies, which are a new treatment option for stage 3 cancer, have been approved for stage 4 NSCLC patients since February 2016 (source: Canadian Agency for Drugs and Technologies in Health).

"What immunotherapy has done is it has provided a new pillar in the treatment of advanced stage lung cancer," Dr. Cheema explains. "Historically, the pillars have been chemotherapy and targeted therapies. Immunotherapy offers a third. That means more options for patients and their oncologists that can potentially improve survival rates."

Because the most common immunotherapies are delivered intravenously, they are often confused with chemotherapy in people's minds, she says. Their mechanisms of action, however, are very different.

The most commonly used immunotherapies are classified as immune checkpoint inhibitors that help the immune system recognize cancer cells and attack them. "Generally, our immune system does surveillance for cancer through the use of various checkpoints," Dr. Cheema explains. "However, cancer cells can take advantage of those checkpoints and hide from the immune system. Immune checkpoint inhibitors allow the immune system to recognize those hidden cells so the person's immune system can effectively kill them. The exciting part of immunotherapy is that if patients respond to immunotherapy, they respond for a longer duration compared to classical chemotherapy. For example, in patients with stage 4 non-small-cell lung cancer, we are already seeing longer term survival rates, with 16 to 18 per cent of patients surviving to three years. Also, the average life expectancy in certain cases treated with immunotherapy increased to two years versus the expected one year."

Another compelling aspect of immunotherapy is that it is well-tolerated by most people and produces fewer side effects than chemotherapy. Clinical trials indicate that when the most commonly used immune checkpoint inhibitors are used on their own only, approximately 15 per cent of patients experience severe side effects. Given that many diagnoses with lung cancer are with people 70 or over in age, this is significant, Dr. Cheema notes. "Although chemotherapy is still better for some patients, depending on a case by case basis, immunotherapy may be a potentially viable option for some patients, who may have not been eligible for chemotherapy. Immunotherapy also opens up the number of patients who should be referred to oncologists for treatment.

"Data collection for stage 3 cancer clinical trials has shown that when immunotherapy, in particular an immune checkpoint inhibitor, is given after patients with stage 3 NSCLC had their standard chemotherapy and radiation, the time to patients' lung cancer growing, or chance of dying from their disease, was delayed by approximately 11 months, compared to placebo," Dr. Cheema says.

Dr. Cheema adds, "The overall survival rate for stage 3 patients is 15 to 25 per cent, so there is significant room for improvement. We won't have definitive numbers of how immunotherapy has improved this cure rate until they are released later this year. Then we will have a better sense of the magnitude of the change."

There is much more that needs to be done, however. Although immunotherapies for stage 4 lung cancers have been approved for reimbursement in many provinces after receiving a positive recommendation by PCODR (Pan-Canadian Oncology Drug Review), approval for stage 3 patients has yet to be decided. At this point, funding is only available through private health insurance plans or drug companies' compassionate supply programs.

With immunotherapies now part of standard of care treatment, Dr. Cheema says things are now looking more hopeful for Stage 3 and 4 lung cancer patients. "With the survival data we are seeing so far, we're very excited about the potential for immunotherapies in treating later-stage lung cancer, including stage 3. The most important part is getting that message out to the community."

NNPSA118879_1_1

PATIENT DIARIES

SPONSORED BY A RESEARCH-BASED PHARMACEUTICAL COMPANY

Lung cancer patient feels hopeful about her future

Postmedia Content Works

Since Jackie Harvey was first diagnosed with stage 3 lung cancer last fall, she often finds strength in the words of Winston Churchill: Fear is a reaction. Courage is a decision.

"I have that on a poster in my computer room," she says. "That's how I have tried to live since my diagnosis."

The 69-year-old Kincardine, Ont. resident says she has always led a very athletic and healthy life. So when she experienced a nagging cough in the fall of 2017, she had no idea that it could be something serious.

"The doctor said my lungs sounded great so put it down to the 100-day cough or post-nasal drip."

When the cough continued, she wisely insisted on an x-ray before she and her husband were to head-off to their annual Florida trip in January.

That's when her world changed. A shadow indicated it was either pneumonia or a tumour. A follow-up CT scan and biopsy confirmed the worst — stage 3 NSCLC (non-small-cell lung cancer).

Harvey was blindsided by the diagnosis. "I never had any pain or shortness of breath. I was working out and playing golf. Other than the cough, nothing was different."

Naturally she was devastated by the news. "In that first five minutes I was thinking: how long do I have and what are my husband and kids going to do? In the beginning I just cried whenever I started talking."

Then she decided to prepare herself for the battle. "I knew I had to face this horrible thing. I knew the news was bad, but also knew I was not going to die right away. So I wanted to enjoy the time I had. I never had to prioritize before because things had always been easy for me. Given my time might be limited, I didn't want to spend it being depressed. So I compartmentalized my cancer into a cupboard in my mind that I could shut."

A key driver behind her fighting spirit was her grandson, who had recently lost a friend in an accident. "He was so devastated by my diagnosis, I had to fight this for his sake."

Immunotherapy treatment has provided Jackie Harvey new reason for hope. *J.P. MOCZULSKI / POSTMEDIA*

Harvey has now gone through the requisite rounds of radiation and chemotherapy. When that was completed, her medical oncologist at London Regional Cancer Program recommended an immunotherapy drug. The treatment, designed for NSCLC, uses an individual's own immune cells to attack cancer cell activity.

"He looked at me and said, 'you will be on this drug when we finish your treatments'," she explains. Immunotherapies recently became available for patients with stage 3 lung cancer. While radiation and chemotherapy attempt to cure the cancer, the addition of immunotherapies to a stage 3 patient's regimen may give the patient more time.

There was only one caveat. The drug, which became available recently, was not yet covered by provincial reimbursement programs. "The co-ordinators at London Regional Cancer Program helped get me through all the red tape with insurance and other paperwork," she says. "The drug company ended up sponsoring me, so I became the first person in Canada to have it."

Harvey's hope now is that the tumour will remain dormant. "Whether the tumour decreases in size any more or not is not the issue. It's whether it's active. We will know in the fall whether that is happening."

Going through the ups and downs of a cancer diagnosis has taught Harvey a great deal about life, she says. "It focuses you in a certain way. You can start taking care of business in the hopes that nothing will happen for a very long time."

One of those orders of business is selling her home in Kincardine and moving to Mt. Brydges to be closer to her oldest daughter and her grandchildren, as well as local hospital facilities. And while she missed out on her Florida trip this past winter, she is making plans to visit a friend for two weeks this year.

"I have learned so many important things from this diagnosis/fight. One is never to underestimate the support and love from others. Also listen to your body. If you know something isn't right, insist on getting your doctor to check it out."

The most important part for Harvey is that she is optimistic about her prospects. "My mission right now is to give other people in my situation hope. Yes, the diagnosis is horrible. But there are so many new drugs and treatments on the horizon that are doing miracles. Right now my doctors are hopeful, and that's enough for me."

All treatment options have benefits and risks, which vary by individual. Patients should consult their doctor to determine the most appropriate option.

THIS STORY WAS CREATED BY CONTENT WORKS, POSTMEDIA'S COMMERCIAL CONTENT DIVISION, AND PATIENT DIARIES, ON BEHALF OF A RESEARCH-BASED PHARMACEUTICAL COMPANY.

New research providing more insight into MPNs

HEIDI WESTFIELD
Postmedia Content Works

The problems started about five or six years ago. Simon Lono started feeling unusually tired and sore. Doctors weren't sure what was wrong. Having just turned 50, the St. John's, Nfld. native was tempted to dismiss the symptoms as just a product of aging. One night was especially rough. He had night sweats and felt so sick he went to his hospital's emergency department. More testing revealed a diagnosis that he wasn't prepared for: myelofibrosis.

"What the hell is that," Lono remembers thinking after receiving the news. "Honestly, I had no idea what they were talking about, and I am a policy researcher. What is this thing? It was shocking how little information there was at the time. It has improved a lot in the last five years."

Myelofibrosis is among a group of blood cancers known as myeloproliferative neoplasms (MPNs). They develop when the body makes too many white or red blood cells, or platelets. Myelofibrosis is a rare condition that leads to scarring of the bone marrow. It also leads to an enlarged spleen and a number of other symptoms, such as fatigue, night sweats, fever, bone pain and weight loss.

Lono was running for municipal office in 2013 when he got the diagnosis. Signs were up, flyers were going out, and he had a team of volunteers. After learning he had cancer, everything stopped. He went from debating policies and rallying supporters to learning as much as he could about a complex blood cancer that was threatening to shorten his life.

"I didn't know what [the diagnosis] meant. I didn't know how long things were going to take," Lono reflects. It was clear this was a condition with a grim prognosis. "One fellow patient said he went home and waited to die. The impact on me, especially at the beginning, was pretty profound."

Half of all Canadians are expected to develop cancer in their lifetime. While the number of newly-diagnosed cases of cancer are increasing, the Canadian Cancer Society notes that survival rates are also on the rise. In hospitals and research labs across the country, discoveries are being made that are leading to better options and outcomes for patients.

One of the world's leading cancer research centres is in downtown Toronto, in a busy corridor known locally as Hospital Row. The Princess Margaret Cancer Centre is a teaching hospital, and a hub of scientific research. Recently it established a new multi-disciplinary program to advance research into MPNs, with the goal to improve outcomes for people living with these disorders.

> ONE FELLOW PATIENT SAID HE WENT HOME AND WAITED TO DIE. THE IMPACT ON ME, ESPECIALLY AT THE BEGINNING, WAS PRETTY PROFOUND.

Dr. Vikas Gupta is an oncologist at Princess Margaret, and an MPN specialist who sees hundreds of patients with the condition each year. He estimates there are about 35,000 Canadians living with this group of blood disorders in Canada. Many of these Canadians have either polycythemia vera or essential thrombocythemia, two of the three main types of MPN. Both of these MPNs, while serious, can generally be controlled with medication, although there can be complications. Some patients experience heart attacks or strokes before they are diagnosed. A smaller proportion of patients are identified as having the third main type of MPN, myelofibrosis. It is, he acknowledges, a challenging diagnosis with limited treatment options.

"Myelofibrosis is associated with a more heavy symptom burden. There are not many effective therapies available, and it is a more aggressive type of cancer," Dr. Gupta notes. "It is associated with a shortened life expectancy."

Just before Simon Lono was diagnosed, a targeted drug therapy called Jakavi was approved in Canada for patients with MPNs. This medication shrinks the enlarged spleen and, Lono says, has relieved most of his symptoms. He is able to work again, and feels like he is back at about 90 per cent of his regular capacity. Still, the underlying disease is continuing to progress. At this point the only option for a cure is a bone marrow transplant (also referred to as a stem cell transplant) but it carries serious risks.

"The only treatment that can cure myelofibrosis is a stem cell transplant or bone marrow transplant," Dr. Gupta explains. "A large proportion of myelofibrosis patients are not suitable for a bone marrow transplant. Some patients don't have donor for transplant, or are not medically fit."

Lono may have a transplant in the next few years. He is also keeping a close eye on emerging medicines and treatments. He believes that in the years to come, they will provide new solutions for Canadians living with myelofibrosis and other MPNs. At Princess Margaret, Dr. Gupta is also confident that the research underway today will lead to new solutions for MPN patients in the decades ahead.

"There is more expertise being built around the treatment of these disorders. There is a good stream of clinical trials coming through the pipeline," Dr. Gupta notes. "I am hopeful that in 10 years' time we will be treating these disorders totally differently than we are treating them today."

NNPSA118874_1_1

> IN THE LAST THREE YEARS, ALL OF THE INNOVATIVE MEDICINES ARE COMING FAST AND FURIOUS INTO THE MELANOMA SPACE. IT IS A GAME-CHANGER FOR US. WE ALWAYS TELL EVERYBODY THAT MELANOMA USED TO BE AT THE BACK OF THE BUS. NOW WE ARE LITERALLY DRIVING THE BUS. — KATHY BARNARD, FOUNDER, CANADA'S SAVE YOUR SKIN FOUNDATION

Medical discoveries driving better outcomes for patients with advanced melanoma

HEIDI WESTFIELD
Postmedia Content Works

Natalie Richardson considers herself one of the lucky ones. In 2014, she joined a clinical trial in Toronto and had access to a new cancer medicine for advanced melanoma. She believes the treatment she received — a new-generation immunotherapy drug — was key to her recovery.

"The fact that I got an immunotherapy treatment at stage 3 probably saved my life. I am still under surveillance and so far, so good; the scans are clear," she says. "The more time that passes, the better my chances are for survival."

Richardson's therapy is among a new class of medications that are changing the landscape of cancer treatment for metastatic (advanced) melanomas. Of the three main types of skin cancer, melanoma is the most aggressive and dangerous. More than 7,000 Canadians are diagnosed with melanoma each year. If caught early, patients have a good chance of being cured. Once the cancer has moved to the lymphatic system and organs, it is much harder to control.

Richardson had always loved being out in the sun. Growing up in Sarnia, Ont., she remembers spending a lot of time near the lake. Back then, she didn't know much about skin cancer and the risks of sun exposure. It wasn't something she spent much time thinking about as an adult, either. Not even when a mole on her right hip started to change colour, size and shape.

"It was turning really black, and big," she recalls. "I didn't have it looked at because I was a busy single mom, and I wasn't aware."

In the spring of 2014, she took her daughter for a check-up to have a sore throat looked at. Her daughter insisted her mom show the doctor the mark on her hip. It was a moment that probably saved her life.

"The doctor looked at me and said, 'What mole?' I showed her, and the look of horror on her face was evident. I thought, 'Wow that is not good, not good at all.'"

Within 48 hours, Richardson was in surgery. The mole was cancerous, and a biopsy revealed the cancer had spread to her lymph nodes. It was advancing quickly, and her organs were at risk. Surgeons removed 13 lymph nodes from her groin area — a difficult procedure that kept Richardson on bed rest for eight weeks and led to other complications.

Kathy Barnard, melanoma survivor and founder of Canada's Save Your Skin Foundation. *SUPPLIED*

At that point, she had two options to try to stop the cancer from coming back: She could receive a standard treatment of interferon injections, or join a clinical trial where she had a 50/50 chance of receiving infusions of a new immunotherapy drug.

"I begged them, can you please put me on the immunotherapy side? I really need it. They were empathetic but they said, 'It is a computer-randomized thing.' We all crossed our fingers and prayed and hoped," Richardson recalls. "When they called me and said I was in the immunotherapy arm, we had a little party."

In the past, a diagnosis of metastatic melanoma was often a death sentence. While chemotherapy remains an important weapon in the fight against cancer, scientists are finding new ways to identify and destroy cancer cells.

Some patients see better outcomes with immunotherapy treatments that boost the body's own ability to fight disease. Others have access to breakthrough targeted therapies that have become available in recent years.

> WHEN THEY SAID I WAS IN THE IMMUNOTHERAPY ARM, WE HAD A LITTLE PARTY.

Targeted therapies are precision medicines that use personalized information on a cancer's genetic footprint to fight disease. They are able to zero in on and destroy specific mutations on cancer cells that make them different from normal cells, usually without damaging healthy cells. For example, they can target cells with the BRAF gene mutation, which is seen in about half of melanoma patients. Recent combinations of targeted therapies have proven effective in shrinking tumours and controlling the spread of disease.

"In the last three years, all of the innovative medicines are coming fast and furious into the melanoma space," notes Kathy Barnard, founder of Canada's Save Your Skin Foundation. "It is a game-changer for us. We always tell everybody that melanoma used to be at the back of the bus. Now we are literally driving the bus."

Barnard was diagnosed with stage 4 melanoma in 2003, and believes she is alive today because she gained access to an immunotherapy treatment developed in the U.S. She started the foundation to provide a voice for melanoma patients and encourage policy-makers to bring new therapies to Canada.

While a flurry of newer medications are coming to market, they are not always available to Canadian patients. Richardson was only able to access immunotherapy drugs at stage 3 through a clinical trial. Organizations like the Save Your Skin Foundation would like to see these treatments made available earlier, before the disease progresses to a critical stage.

"We would like to see equal and timely access for patients. Patients with stage 3 melanoma shouldn't have to sit and watch their disease grow," Barnard says. "They can get a treatment that we know works."

After a harrowing experience with skin cancer, Richardson is grateful to be cancer-free and watch her twin daughters grow up. She wants younger Canadians to be more careful than she was about sun exposure and tanning beds. Teenagers can be exposed to a lot of glib conversations online that diminish the dangers of tanning. Her message: there is no such thing as a safe tan.

"We need a little bit of sun for Vitamin D but we don't need to be in the sun for two hours — 20 minutes is fine. Be happy in your own skin. The damage done when you are young is irreversible and removes choices from your life later on."

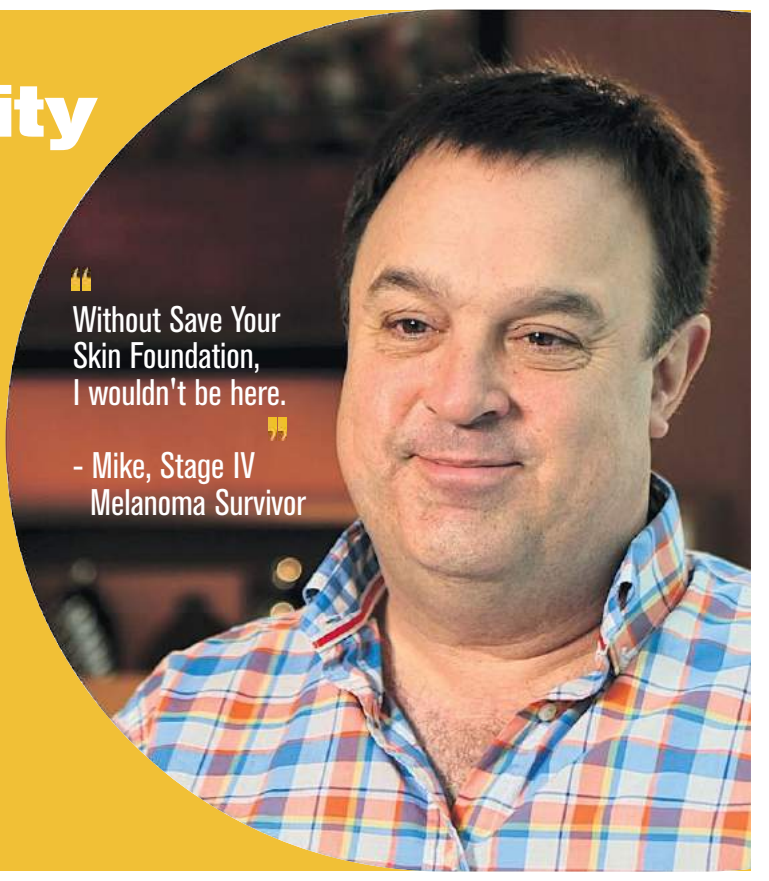
save your skin FOUNDATION

LA FONDATION sauve ta peau

Connect with a community of melanoma patients and survivors

Providing 1-on-1 support to those touched by melanoma

Founded in 2006 by Stage 4 melanoma survivor Kathleen Barnard, Save Your Skin Foundation is a not-for-profit organization dedicated to the fight against non-melanoma skin cancers, melanoma, and ocular melanoma. We help those with melanoma find the latest treatments and provide support for those who need it. If you or someone you know has been touched by skin cancer and needs assistance, please reach out to us.



Last year, 7,200 Canadians were diagnosed with melanoma skin cancer But, there is hope

Save Your Skin Foundation relies on donations from people like you to continue helping Canadians across the country who have been touched by melanoma. With your donation we can continue to ensure patients receive the best possible care, give patients a voice in the health care space, and fight to improve patient access to life-saving therapies.

Kathleen Barnard, Melanoma Survivor, President and Founder

1-800-460-5832 info@saveyourskin.ca saveyourskin.ca

PATIENT DIARIES

SPONSORED BY A RESEARCH-BASED PHARMACEUTICAL COMPANY

Milène Lanthier and her family have learned to live in the moment. *DARIO AYALA / POSTMEDIA*

Raising awareness of metastatic breast cancer

Postmedia Content Works

Milène Lanthier is learning to live in the moment. Since she was diagnosed with advanced breast cancer last year, her priorities have changed. Living with an incurable disease has made every day, every dinner with family and friends, more valuable.

"Before, I was just going through the motions, rushing every day, it was nonstop. Now we are really oriented towards being happy," the Montreal-area woman reflects. She and her husband are focused on making the most of their time together with their children: "We are parenting in a different way. We don't talk about retirement anymore, we don't talk about when we are old. The time is now."

Lanthier was 43 years old when she found four lumps on her left breast in the spring of 2015. The diagnosis of breast cancer was shocking, but doctors were optimistic. The cancer was detected early — at stage 1 — when survival rates are high and outcomes generally positive. She underwent surgery and treatment, and was declared cancer-free. While she continued to be regularly monitored for any signs of relapse, she was hopeful this health scare was behind her.

It wasn't long before the mother of two teenage boys was back to her regular routine: making lunches, working, and checking in with friends. She took up yoga, and thought maybe it was responsible for the nagging pain in her lower back. The pain didn't go away, getting more intense and debilitating.

"It was awful, it was getting to the point where I had trouble walking and sitting down," she recalls. "I said, 'Okay what is wrong with me? The pain is getting worse. It is not stabilizing.' That is what triggered me to go back to my oncologist."

Breast cancer is the most common form of cancer among Canadian women after non-melanoma skin cancer. The Public Health Agency of Canada estimated that in 2017, more than 25,000 women would be diagnosed with the disease in Canada. (Breast cancer also affects men but in much smaller numbers.) One in eight women is expected to develop breast cancer in their lifetime.

Many cases are caught early, and are often dealt with effectively with surgery and treatment. In other cases, the cancer is more persistent and destructive, moving beyond the breast to other parts of the body like the brain, lungs and bones. This form of the disease, known as metastatic cancer, is often deadly. Data from the Canadian Cancer Society lists the five-year relative survival rate for metastatic breast cancer at 22 per cent.

Less than five per cent of newly-diagnosed breast cancers in Canada are characterized as metastatic. For people first diagnosed with early-stage breast cancer, there's a 30 per cent chance of developing recurrent advanced or metastatic breast cancer at a later time.

> "A BIG PART OF FEELING GOOD AND DOING OKAY IS TO BE SURROUNDED BY THOSE WHO YOU LOVE

In Lanthier's case, after her initial stage 1 cancer treatments, some cancer cells had likely remained hidden in her body, undetected by scans and other tests. By the time she started feeling back pain, the cancer had resurfaced in her bones.

"My doctor met with me and told me I had metastasis to my bones and I was stage 4," Lanthier remembers. She chose to join a clinical study, which was instrumental in changing her outlook. "You go from total despair from being completely scared and depressed to okay — here's a door. Here's something we can do. Here's a plan. That was a lifesaver for me."

A year after joining a clinical trial for advanced breast cancer, she is seeing results from a targeted therapy. She is back at work full-time, which she believes is vital to her well-being:

"My boss is amazing and that makes all the difference in the world. He is very understanding; you can imagine all the medical appointments I have. It is very important to get up in the morning and have a purpose," she says.

She advises the thousands of Canadian women living with metastatic breast cancer not to give up, and look beyond the grim statistics. New scientific advances in oncology, she believes, are providing new hope for people fighting advanced cancers.

As a mother she has always put her children first, but now Lanthier is also taking some time for herself. She doesn't allow any negativity around her to drain her energy. Her priority is to stay as healthy as she can, so she can embrace and enjoy the time she has.

"As women we want to save people a lot of the time. I can't waste anymore energy on that. Having good moments with my family and friends is just like medicine," she says. "A big part of feeling good and doing okay is to be surrounded by those who you love."

THIS STORY WAS CREATED BY CONTENT WORKS, POSTMEDIA'S COMMERCIAL CONTENT DIVISION, AND PATIENT DIARIES, ON BEHALF OF A RESEARCH-BASED PHARMACEUTICAL COMPANY.

THE HARD FACTS

ABOUT LUNG CANCER IN CANADA...

#1

LUNG CANCER IS THE MOST COMMONLY DIAGNOSED AND **LEADING KILLER OF ALL CANCERS IN CANADA***

28,600

PEOPLE WERE DIAGNOSED WITH LUNG CANCER IN 2017*

APPROXIMATELY

50%

OF LUNG CANCER PATIENTS ARE DIAGNOSED AT STAGE 4*

KILLS

21,100+

CANADIANS EACH YEAR.

MORE THAN BREAST, PROSTATE, AND COLON CANCER COMBINED*

EVERY **DAY** **57**

57 CANADIANS WILL DIE FROM LUNG CANCER.*

LUNG CANCER ACCOUNTS FOR

26%

OF ALL CANCER DEATHS IN CANADA.*

THE FIVE-YEAR SURVIVAL RATE FOR LUNG CANCER IS ONLY

17% VS. 95% PROSTATE
87% BREAST
64% COLORECTAL*

ADVANCEMENTS ARE HANDICAPPED BY **VASTLY INADEQUATE RESEARCH FUNDING.***

7% LUNG CANCER

93% OTHER CANCERS

THIS NEEDS TO CHANGE AND WE NEED YOUR HELP...

DONATE / VOLUNTEER / ADVOCATE
LEARN MORE AT LUNGCANCERCANADA.CA

LUNG CANCER CANADA

AWARENESS. SUPPORT. EDUCATION.

* Canadian Cancer Statistics Advisory Committee. *Canadian Cancer Statistics 2018*. Toronto, ON: Canadian Cancer Society; 2018.
**Charity Intelligence Canada. *Cancer in Canada: Framing the Crisis and Previewing the Opportunity for Donors*. Toronto, ON; 2011.

About Lung Cancer Canada

Based in Toronto, Lung Cancer Canada (LCC) is Canada's only national charitable organization that is solely focussed on lung cancer. Lung Cancer Canada serves as Canada's leading resource for lung cancer education, patient support, research, and advocacy. LCC's mission is four-fold: 1) to increase public awareness of lung cancer, 2) to support and advocate for lung cancer patients and their families, 3) to provide educational resources to patients, family members, healthcare professionals, and the general public, and 4) to raise funds in support of promising research opportunities.

CRA #: RT 872775119 RR0001