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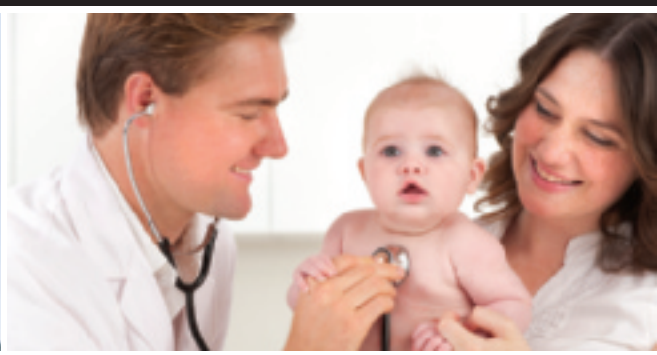

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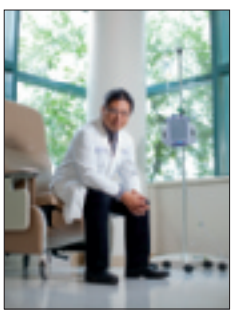

Dr. Calvin Law, interim Odette Cancer Program chief, leads a team pursuing innovative new forms of chemotherapy aimed at better and safer outcomes for cancer patients.

Photography by Tim Fraser

Sunnybrook

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COMING FULL CIRCLE

Kadra Mahamed began her career at Sunnybrook as a co-op student while still in high school. She continued to work at the hospital while studying for an undergraduate degree in nursing and a master's degree in education, and is now a nurse in the very same unit she worked in as a co-op student over a decade ago.

"In my final year of high school I did a three-month co-op placement at Sunnybrook in the Cardiovascular Intensive Care Unit (CVICU). I was already interested in pursuing a career in health care, but that experience helped me decide to be a nurse.

Just as I was finishing my co-op placement, there was an opening for a patient service associate in the CVICU. I got the job, and worked part-time in that role for the next four years. Being able to work in the unit while pursuing my nursing degree was invaluable. Taking what I was learning in the classroom and seeing it put to work with patients really helped prepare me for my career.

Two years after graduation, I was hired as a nurse in the CVICU, the same unit where my health-care career had begun seven years earlier. Coming full circle was no accident; I worked hard and made choices throughout my education that would help lead me back to the CVICU. I've always really enjoyed working with the patient population in that unit. Helping them recover from heart surgery and seeing the progress they make is so rewarding.

The staff in the CVICU have known me since the beginning, and they've supported me so much over the years. I love working with them, and they are proud of what I've accomplished in my career. I've learned a lot from them.

My passion for learning has evolved into a passion for teaching. In addition to my job in the CVICU, I'm a clinical instructor at a local college, where I teach students in the Registered Practical Nurse program. Teachers, both in the classroom and in the hospital, were so important in helping me get where I am today. I'm excited to pass my knowledge along to the next generation of learners.

– As told to Sybil Edmonds

THREE GENERATIONS, ONE DREAM

Dr. Stewart Wright is a third-generation orthopaedic surgeon at Sunnybrook's Holland Orthopaedic & Arthritic Centre. He joined the staff in 1982 and is currently an assistant professor at the University of Toronto.

– – –

"I remember being a kid going to hockey games at Maple Leaf Gardens with my father. We'd come back to the hospital here on Wellesley Street and enter through the back doors where the kitchen was. A lovely lady on staff would make us hot chocolate.

This hospital has been my second home. It's been the family business forever and a day.

Granddad (Dr. C. Stewart Wright) dreamt of building a hospital that would be devoted solely to the care of people afflicted with orthopaedic and arthritic problems: from diagnosis to prevention, treatment and aftercare. He believed in the power of orthopaedic surgery before it was even considered a specialized discipline in Canada. In 1949, his dream was close to reality when the government granted him the charter to build the new hospital. Sadly, Granddad died just three years before his dream came to fruition.

My father (Dr. Charles S. Wright), who had just trained as an orthopaedic surgeon himself at the time, took the reins and, along with Dr. James Bateman, fulfilled the dream. They opened the hospital in 1955.

Father always treated the patients and staff as if they were family. He even started a tradition of dressing up as Santa Claus at the hospital's holiday party, giving gifts to all the staff to show appreciation for the work they did every day. I carry on that tradition. It's just what the Wright family does.

Today, the Holland Orthopaedic & Arthritic Centre is considered one of the centres of excellence for hip and knee replacements in Ontario. Our techniques are always advancing. Pain control has improved. Rehab protocols are much better. Patients are in and out a lot quicker. They are often so appreciative of the care they receive, they come back as volunteers. It makes me proud to know they believe in this place as much as I do.

If Father and Granddad could see the care we provide today, they'd be smiling.

– As told to Katherine Nazimek

FROM TRAUMA NURSING TO POLICY

Described as "a living page of Sunnybrook history," Anne Thomson, Sunnybrook employee of 42 years, retired in September 2013. Here, she speaks of myriad tales, firsts, spirituality and human connections.

"When I first came here as a nurse in 1971, I thought I was going to work in intensive care. Turned out, it was really extended care. I was fairly new to the country and never heard the term before. Luckily, it turned out to be wonderful nursing care with the veterans.

Six months later, I went to work as a nurse in emergency – my original plan. There were only three stretchers and an examination chair. It then changed in the mid-seventies with a new emergency department. I was given the title of head nurse and with Dr. Bob McMurty, medical director of the ER, we prepared to open the regional trauma unit, the first in Canada.

Our first patient was a 19-year-old who had been in a motorbike accident. He lost his left arm and right leg, both very traumatic amputations. We talked to his friends about the severity of his injuries. It was difficult for them to hear, but he needed their love and support. I was adamant that spiritual care be incorporated into the unit for families and loved ones.

In those days, we saw mostly recreational and motor vehicle accidents, and blunt trauma. Our first gunshot patient was a bank robber shot by police in Leaside, Ont. My first thought was: 'Served you right for robbing the bank,' but my feeling was quickly suppressed by compassion for his family. That was our first foray into the need for forensic evidence.

Emergency was the love of my life. I like to go into complex situations and simplify challenges down to the ABCs. I like the fast pace and the constantly changing priorities.

I went on to implement a nursing workload measurement system in the mid-eighties, wrote many corporate patient-care policies and created the first and second generations of emergency response plans. Twelve years ago, I transitioned to risk manager, a natural progression for me. If the wheels are sticking out, I have to kick them in. A spill on the floor, I have to clean it up.

Some of the most memorable parts of my career were empowering others and transferring knowledge. I taught nursing students during those years. It's a joy to have students and to see their enthusiasm. They trusted me and came to me for help. It's important to nurture our young, give them a good experience and empower them to be the best they can be. Help them not by solving their problems for them, but help them to strategize to deal with things. It's true that if you give a man a fish, he eats for a day. If you teach him to fish, he eats for a lifetime. *– As told to Nadia Radovini*

NURTURING PATIENTS AND THEIR FAMILIES

Karen Smith has been the Patient Care Manager at Sunnybrook's Ross Tilley Burn Centre since 1998, and was involved in the centre's move from the Wellesley Hospital to Sunnybrook's Bayview location on December 5, 1998.

"I started my career as a nurse in 1985 at the Ross Tilley Burn Centre when it was at the Wellesley Hospital. I have always worked in burn care, because I believe it is a privilege to look after someone in his or her darkest moments. You take care of their eyes when they can't blink. You take care of their mouth when they can't swallow. You hold their arm while a complex bandage is applied. It's extremely satisfying to help and serve other people.

I started as Manager of the Burn Centre at Sunnybrook in September 1998 and three months later we made the big move to Bayview. It was a highly co-ordinated effort that involved Toronto EMS and staff from across the hospital. We successfully transported eight burn patients that day, three of whom were critically ill.

While we settled into our new home, we had a lot of support from the hospital. I worked closely with everyone from Pharmacy to Labs to Shipping & Receiving to make sure they knew what our specific needs were.

The Burn Centre is a unique environment that cares for a challenging patient population. We're a combination of an ICU, a ward and an emergency department (ED), because most burn patients are brought directly to us. They usually don't go through our ED.

When I describe the job to people I say, 'You could be looking after three burn patients – one is going to rehab that day, and two others require simple bandage changes. Then you get a tap on the shoulder and you're told a patient is coming in with burns to 60 per cent of their body. Your work day can go from quiet to caring for the sickest patient in the hospital.'

It's an environment that can change quickly, and you have to be highly involved not just in the beginning, but through every stage of a patient's stay. Families can be with us for several months, so we nurture those relationships, keep communication open, and help them conserve their energy throughout the process. Patients will come back and say, "You didn't just take care of me – the team took care of all of us." *– As told to Laura Bristow*

CONNECTING WITH PATIENTS

Ilbiko Safian has worked at Sunnybrook for 40 years. Her first position was as a unit aid before she became a patient services partner (PSP). After retiring, she missed working at Sunnybrook so much that she decided to come back and work on a part-time basis, joining the Environmental Services team.

– – –

“When in my youth and in my home country of Hungary, I trained as a chemist and worked with a pharmaceutical company.

Life as we knew it was changing and in 1957, I left Budapest and came to Canada with my husband. We had married only the day before. It was a difficult time. I was an only child and was forced to leave my mother and father behind.

Canada has been a wonderful home, and at Sunnybrook I have been surrounded by truly great people. Caring and connecting with patients to ensure that they have the best possible experience while in hospital has been in my heart since I began working here in 1973.

Coming from a war-torn country, I feel as though I understand the old soldiers living in the Veterans Centre. I never thought I could connect with a patient so easily. I can see how emotional they are and I love taking a moment to talk with them. What I see is living history: men and women who have lived their lives to the fullest.

I have worked in so many areas throughout the hospital: cardiology, the dialysis unit, the infectious diseases unit, surgical intensive care (now the critical care unit), the Burn Centre and the Veterans Centre. I feel so very fortunate to work with incredible people and so many high-level, dedicated professionals.

When I think back on my years at Sunnybrook, the patient involvement is what stands out and defines so many of my memories.

One of my greatest highlights at Sunnybrook was having the pleasure of caring for A.J. Casson. At 90, he still had a great sense of humour and would tell us many interesting stories about his life and the other members of the Group of Seven [painters]. We were fortunate to celebrate his 90th birthday with him.

For me, I am most pleased when I know that I helped make life a bit better at a time when there was little hope. There is nothing more rewarding than when a patient recovers from their illness. To see someone walk again after an illness or traumatic injury cannot be measured. *– As told to Sally Fur*

A DEFINING MOMENT

Patricia Morin is a registered nurse in the Outpatient Medical Procedures clinic. She began her nursing career at Sunnybrook 36 years ago.

"In 1996, I experienced at work what some may call divine intervention. Others may say it was sheer luck, or simply that I was in the right place at the right time. Whatever the reason, it saved my husband's life and made me a better nurse.

I saw a bulletin for a lecture series at Sunnybrook on prostate-specific antigen (PSA) testing. Prostate cancer was the furthest thing from my mind, but I felt compelled to attend and convinced my husband to join me.

The auditorium was packed. We listened attentively about how this relatively new blood test has the ability to detect prostate cancer. On the way home, I insisted that my husband get tested at his next physical.

I remember the doctor saying to my husband, "You're perfectly fine. There's only one thing I'm worried about and that's your PSA level. You should see a urologist."

The cancer was outside of his prostate gland. I remember the urgency, the fear, the anxiety and the relief. It was an early diagnosis and a lucky interception. Sunnybrook saved his life. Seventeen years later he is alive and well.

That experience was a defining moment in my career.

Science hasn't always been on our side. When I trained as a nurse in the late 1960s, we didn't have the medical advances we have today. We relied on the art of nursing – the art of empathy and caring. What I didn't know then was that the art of nursing is learned through experience and the role models around you.

As nurses, we need to engage the patient and their family, and establish trust in a very short period of time. The journey I shared with my husband gave me the ability to truly empathize, to say with sincerity that, 'I know what you're going through and I am here to help you.' When I can alleviate the fears and anxieties of my patients and their families, that's when I feel the greatest satisfaction. – *As told to Katherine Nazimek*

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Jeffrey Switzer M,S
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Just this one short word is enough to strike fear in the heart of anyone diagnosed with cancer. But Sunnybrook researchers are making strides toward a future where chemotherapy will be simpler, safer and highly effective – and its devastating side effects a thing of the past

By Dan Birch

PHOTOGRAPH BY TIM FRASER

CHEMO

Delaney Janhunen was approaching her 36th birthday when she discovered a lump in her right breast. "You feel invincible when you're young and then all of a sudden you have this wake-up call," says Delaney, a Kitchener, Ont., mother of three, who is now 42.

Living in St. Catharines, Ont., at the time, Delaney was diagnosed with HER2-positive breast cancer, an aggressive type associated with overexpression of HER2 receptors on the cancer cell. "We were shocked and devastated when we realized how aggressive it was," Delaney recalls. It was an "additional devastation" when she and her husband, Paul, learned the cancer had produced seven tumours in her liver.

The young family was turned upside down. Delaney's new reality became surgery and ongoing drug therapy to eliminate the cancer and prevent its return. It worked for about two-and-a-half years, but the HER2-positive cancer returned, this time appearing in her left armpit.

It wasn't surprising to Delaney that it came back – doctors had been telling her the odds of recurrence were high. But it was still a crushing blow: "I had started hoping and wondering and praying that I was actually cured."

Delaney had a back-up plan. Before the recurrence, an acquaintance who also had HER2-positive breast cancer told her about a promising drug clinical trial underway at Sunnybrook's Odette Cancer Centre. The drug was T-DM1, which is a novel combination of a targeted drug therapy (Herceptin) and a chemotherapy drug (DM1). The combination drug is effective at zeroing in and killing breast cancer cells, while producing minimal side effects.

TRIALS AND TRIBULATIONS

Delaney's oncologist wasted no time in contacting Dr. Sunil Verma, a Sunnybrook medical oncologist and the lead author of the international T-DM1 study, which included patients from 213 centres around the world. Delaney received her first T-DM1 infusion in September 2010. She continues to make the

“THESE FINDINGS [THE T-DM1 STUDY] CREATE THE FRAMEWORK FOR A NEW DIRECTION FOR THE TREATMENT OF CANCERS, AND POTENTIALLY FOR EARLIER STAGES OF THE DISEASE.”

DR. SUNIL VERMA, MEDICAL ONCOLOGIST

PHOTOGRAPH BY TIM FRASER

trek from Kitchener to Sunnybrook once every three weeks to get her 30-minute infusion. Her tumours quickly shrank and she now has no detectable cancer on her CT imaging. "It's been a miracle drug, that's for sure," she proclaims.

"Delaney is one of hundreds of people who gain access to leading-edge cancer drug treatments every year through the Odette Cancer Program's clinical trial activities," says Dr. Calvin Law, the program's interim chief. "These trials are carried out at our Odette Cancer Centre's newly renovated and expanded chemotherapy unit."

Sunnybrook researchers, such as Dr. Robert Kerbel, are also pushing the frontiers of cancer drug therapy by developing less toxic, unconventional chemotherapy drug strategies that can be combined with other drugs, including Herceptin and T-DM1.

Innovation in therapy isn't limited to the treatments themselves. Odette Cancer Program staff are continually focused on improving the patient experience through technological and process improvements.

For Delaney, being selected for the T-DM1 trial "was like winning the lottery. I was jumping up and down."

Most importantly, the drug has kept her cancer at bay, but also key for Delaney, her husband and kids (ages ranging between nine and 14) is that there have been very few side effects. "The fact that you don't lose your hair and you don't feel sick has been wonderful," Delaney reports, although she does experience dry mouth and occasional tingling in her fingers.

Compare this to the side effects of the drug therapy she received when she was first diagnosed with cancer in 2007. She lost her hair, eyebrows and eyelashes, and experienced fatigue for a few days after every round of treatment. "Losing my hair was very difficult to go through," she recalls, "difficult for my kids, too, because up until then you can go through life and not show everybody that you're sick."

Results from the T-DM1 study were published in the prestigious *New England Journal of Medicine* in November 2012. "Women who received T-DM1 lived much longer, had fewer side effects and enjoyed a better quality of life compared to those who received standard chemotherapy," says Dr. Verma. "These findings create the framework for a new direction for the treatment of cancers, and potentially for earlier stages of disease, by improving the way chemotherapies can now be combined with targeted therapies."

PHOTOGRAPH BY DOUG NICHOLSON

Delaney feels fortunate to have been included in the trial. She's also pleased to have taken part in research that recently resulted in the widespread approval of the drug for women with HER2-positive breast cancer. "It's humbling to think I had a role in helping to bring this drug to women across Canada," she says.

LESS CAN BE MORE

On the opposite end of the cancer research spectrum, Dr. Kerbel is partnering with Israel's Dr. Yuval Shaked on preclinical studies to get a better understanding of why "less can be more" when it comes to chemotherapy.

Dr. Kerbel has spent nearly half of his 30-year career as a cancer biologist pioneering a treatment known as metronomic chemotherapy. Unlike traditional chemo – characterized by high doses of toxic anti-cancer drugs usually given every few weeks for up to five months – metronomic chemotherapy uses lower and less toxic doses that are delivered more frequently, even daily, over one or more years.

"Traditional chemotherapy remains one of the main treatment methods for cancer, yet it has considerable side effects," explains Dr. Kerbel, a senior scientist at Sunnybrook Research Institute (SRI) and the Canada Research Chair in Tumour Biology, Angiogenesis and Antiangiogenic Therapy. "For people with cancers that spread aggressively, standard chemo usually doesn't extend life expectancy very much. In preclinical research, my laboratory has developed quite effective metronomic chemotherapy treatments for aggressive metastatic cancers – used either on their own or in combination with drugs called angiogenesis inhibitors, which cut off the blood supply that feeds tumours."

Dr. Shaked, who worked in Dr. Kerbel's SRI lab as a postdoctoral fellow, is now an assistant professor with the Rappaport Faculty of Medicine at Technion (Israel Institute of Technology). He notes that metronomic chemo remains a niche treatment concept that needs further investigation to bring it into the mainstream. In particular, the medical oncology world needs a better understanding of the biological mechanisms the treatment uses to attack cancer cells.

Drs. Kerbel and Shaked will get these answers with their international research collaboration. Through a generous donation from Rena and Michael Buckstein, Sunnybrook Foundation and Israel Cancer Research Fund are partnering to fund this innovative Canadian-Israeli research project.

"We will study several aspects of how metronomic chemotherapy acts against cancer cells," says Dr. Shaked. "This includes whether this method can target the reactive host response usually found after conventional chemotherapy, thereby delaying tumour relapse, in addition to the ability of metronomic chemo to act against tumour cells that are

DR. YUVAL SHAKED (LEFT) AND DR. ROBERT KERBEL ARE PARTNERING ON PRECLINICAL STUDIES ON THE POTENTIAL OF "LESS IS MORE" CANCER TREATMENTS.

usually resistant to conventional therapy."

Their research will bolster recent and ongoing human clinical trials of metronomic chemo. A large study in the Netherlands among colon cancer patients has provided the first clinical evidence of the treatment's promise, and there are several other large trials underway among metastatic breast cancer patients around the world.

STAND AND DELIVER

For the Odette Cancer Program, innovation in drug treatment extends beyond testing the newest drugs and developing leading-edge therapies. Improving the delivery of treatment is equally vital.

"In recent years, we've made important changes that have led to notable improvements in the scheduling of therapy and the patient experience," says Philomena Sousa, process specialist and manager at the Odette Cancer Centre.

One change was the development and implementation of the Chemotherapy Appointment Reservation Manager (CHARM), software that has helped reduce the average treatment wait time. It has also cut the number of phone calls between chemotherapy unit and pharmacy staff by 80 per cent, thanks to CHARM's automated communication approval of patient drug therapy regimens.

"The software streamlines processes through electronic communication and is essential for a busy chemotherapy unit like Sunnybrook's, which delivers treatment to about 23,000 patients each year," explains Dr. Maureen Trudeau, Sunnybrook's head of medical oncology.

The complexity of cancer drug treatments continues to increase. There are more than 400 different treatments, which vary in duration from 15 minutes to eight hours, plus clinical trials that result in changing treatment protocols. CHARM improves efficiency by accounting for various factors, including blood work requirements, medication mix time, nursing preparation and teaching time, patient condition, treatment complexity and infusion time.

The latest improvement in the drug therapy patient experience at the Odette Cancer Centre is the addition of a screen in the chemo waiting area that confidentially displays real-time information on appointment status. The aim is to keep patients in the loop at all times.

For instance, patients can see when their medications are being prepared and know how close they are to being called into the treatment suite. "Having this information frees patients to move around much more," says Sousa. "They can go and grab a coffee if they want, rather than be glued to their seats."

Dr. Calvin Law, interim Odette Cancer Program chief, says innovation within Sunnybrook's drug therapy program is wide-ranging. "Our experts do it all. They test and provide access to promising therapies. They pioneer the treatments of tomorrow through fundamental research, and they improve how we deliver treatment to patients.

"In the end, it all comes down to improving people's lives."

MORE QUICKLY TO THE ATTACK

For people with advanced non-small cell lung cancer (NSCLC), time is particularly of the essence. The cancer, which accounts for approximately 80 per cent of all lung cancers, can spark a rapid decline in health.

That's why Sunnybrook has made changes that have resulted in these patients beginning drug therapy about three weeks sooner. Sunnybrook medical oncologist Dr. Parneet Cheema and Dr. Simon Raphael, deputy chief of Anatomic Pathology at Sunnybrook, spearheaded the initiative and are now sharing their experience with other Canadian hospitals to improve care for lung cancer patients further afield.

Through collaboration by medical oncologists and pathologists, Sunnybrook now expedites crucial tests that detect genetic mutations relevant to NSCLC patients. "Having one of the two mutations – known by their acronyms EGFR and ALK – will influence the choice of treatment," says Dr. Raphael, "so the sooner the status is known the sooner care can get underway."

Starting treatment earlier allows patients to receive life-extending drugs sooner, before they are too sick to receive therapy. "By receiving personalized drug therapy, according to the results of these mutation tests," notes Dr. Cheema, "patients may gain much more time – in some cases years – and improvement in their quality of life."


Last will
and
Testament

Where there's a will...

When family members contest a will, who interprets what the deceased really meant? How one geriatric psychiatrist is helping the courts decide

By L.H. Tiffany Hsieh

Minutes before he leaps from a balcony to his death, Troy Phelan faces a mob of lawyers and psychiatrists gathered in his office to determine if he's in his right mind.

"I'm sitting here to prove to the world that I am of sufficient mental capacity to make a new will," the eccentric elderly billionaire in John Grisham's legal thriller, *The Testament*, reckons. "Once it is proved, the disposition of my assets cannot be questioned." Looking around the conference table, he muses, "They expect me to be somewhat loony, but I'm about to eat them for lunch."

After Phelan receives a clean bill for his soundness of mind, he decides to leave one final – unexpected – handwritten will, bequeathing his vast fortune to an illegitimate daughter instead of his six children by three marriages. This triggers his family to contest the new will. Although he was examined by the country's top medical experts, Phelan's children and ex-wives argue he was lacking sanity at the time of the new will.

ILLUSTRATION BY STEVE ADAMS

Was he? Did he lose sanity in a matter of minutes? These are questions Dr. Kenneth Shulman is regularly called upon to give his expert opinion in the midst of family dramas unfolding before the courts.

A geriatric psychiatrist and chief of Sunnybrook's Brain Sciences Program, Dr. Shulman was first enlisted 30 years ago by the late prominent estate lawyer Rodney Hull to assess testamentary capacity, a legal test that determines whether or not an individual is capable of executing a will. Since then, Dr. Shulman has been qualified as an expert witness. He has testified in two cases in Alberta and seven in Ontario, and assessed more than 100 cases across Canada and worldwide.

"This is one of the most interesting interfaces between the medical and legal professions," Dr. Shulman says. "The issues usually revolve around family dynamics, typically family conflict and human greed in the context of cognitive disorders and frailty in older adults who have executed a will. My role is to help the court make an informed decision."

While people are presumed capable of executing a will in the eyes of the law, when capacity is challenged based on suspicious circumstances or reasonable grounds, the court will require input from a medical or psychological expert to identify whether there are psychiatric or cognitive disorders that might have affected the individual's mental capacity.

"The most common scenario is older people who may or may not be suffering from some form of cognitive impairment," Dr. Shulman explains. "They may lack capacity and be vulnerable to what the court calls 'undue influence.' If somebody is frail or cognitively impaired, they may be vulnerable to being influenced by somebody else to change their will."

In the 2006 matter of *Hutchinson v. Hutchinson*, the Ontario Superior Court declared a will invalid after considering evidence that seriously questioned the capacity of the deceased, who died in 2002 at the age of 86.

The plaintiffs – three of his four children – testified that their father suffered from dementia as early as 1995 and wasn't aware of what was happening around him. In 1998, he began living at his home with the defendants, his youngest son and the son's wife. Soon after, the father transferred his home and investment account to his youngest son, and made a new will that left his entire estate to him. In a prior will executed in 1992, the deceased divided his estate equally amongst his four children.

Based on the deceased's failing health and evidence that suggested the defendants took steps to convince him that his other children were attempting to take his money, the court determined there was a presumption of undue influence. It found that the defendants had failed to prove that the deceased had testamentary capacity when executing his new will. As a result, the transfer of assets was brought to a halt.

In giving retrospective opinion about a person who has died, Dr. Shulman says his job is to garner as much information as possible from medical records, legal documents and other examinations of individuals who had knowledge of the person.

"Although that seems very challenging, if you have enough information, a medical expert can often form a reasonable opinion," he explains. "What's happening more often is that because lawyers are increasingly aware that wills may be challenged, particularly under conflict-filled circumstances, they will ask a medical expert to do a contemporaneous assessment while the individual is alive." Dr. Shulman adds that kind of opinion would be far more difficult to challenge, "but a good retrospective opinion is often better than a poor contemporaneous opinion."

> "This is one of the most interesting interfaces between the medical and legal professions. My role is to help the court make an informed decision."
>
> DR. KENNETH SCHULMAN
> CHIEF, SUNNYBROOK
> BRAIN SCIENCES PROGRAM

While the deceased in the *Hutchinson v. Hutchinson* case suffered from dementia and was deemed incapable of executing his final will, others with a history of mental illness can possess the right mental capacity required to execute theirs.

"Testamentary capacity is both task-specific and situation-specific," Dr. Shulman explains. "Your capacity to make a will is different than your capacity to manage finances or to drive a car. Each capacity has to be assessed individually and specifically."

The most famous leading authority on testamentary capacity is the judgment in the 1870 matter of *Banks v. Goodfellow*. John Banks, who executed a will, suffered from a chronic and serious mental disorder. The court decided he was delusional, but capable of distributing his assets.

"You can be delusional and psychologically ill, but if it's not

influencing the will, you are still capable," Dr. Shulman says. However, "if you believe one of your children has been stealing from you when that's really a behavioural and psychological symptom of dementia, then that's a delusion that influences the fact that you've cut them out of the will. That will won't be considered valid in law."

Currently, Dr. Shulman is working closely with Toronto estate lawyer Ian Hull, son of Rodney Hull, to research lucid intervals, the notion that an individual can be impaired most of the time, but have periods – good days – when they are lucid and apparently capable of executing a will.

"We are looking at what we call cognitive fluctuation," he explains. "Is there evidence that individuals suffering from dementia, like Alzheimer's disease, have significant fluctuations that might correspond to the legal concept of the lucid interval?"

Hull, who began working in estate litigation in 1992 with his father, reckons the legal theory that someone can have good days and bad days doesn't make sense. "We think the courts may not be right," he believes. "Medical evidence suggests that someone with a serious mental illness can either have bad days or okay days, not good days in which they are lucid enough to execute a will."

Both Hull and Dr. Shulman anticipate more challenges to testamentary capacity in the coming decades due to a number of factors. These include the complexity of modern families, the high prevalence of cognitive impairment and dementia in older adults and, the economic reality that there's disproportionate wealth in the hands of older people while younger people face financial difficulties and depend on being beneficiaries of family estates.

"There's a tremendous transfer of wealth seen every day in court. Not only do we have far more cases, there is far more at stake, which is a recipe for potential litigation," warns Hull. "When I started more than 20 years ago, $1-million was considered high stakes. These days, a typical amount can be anywhere between $5-million to $50-million."

Besides lucid intervals, Dr. Shulman is proposing to conduct ongoing research in areas where there's a medical-legal interface. With his colleague Dr. Mark Sinyor and others at Sunnybrook, he is studying suicide notes and handwritten wills, otherwise known as holographic wills. Dr. Shulman proposes to collaborate with Hull and other legal professionals to understand these issues better and educate both lawyers and physicians on these matters.

"It's an important societal issue and it profoundly affects people's lives," Dr. Shulman says. "Children and spouses are often deeply hurt by changes made under undue influence or by an incapable person. It doesn't mean that wills have to be fair, but these are opportunities to correct those injustices."

ON THE MIND

Some common psychiatric conditions that can affect capacity and vulnerability to undue influence:

DEMENTIA
Dementia can affect insight, perception, judgment and impulse control. Mild forms of memory impairment can be associated with suspiciousness or even paranoid delusions.

ALCOHOL
Alcoholism and alcohol abuse can have both acute and chronic effects on cognition, judgment and behaviour.

MOOD DISORDERS
Mood disorders, including depression and bipolar disorder, may produce cognitive distortions (delusions), compromise judgment and cause irritability or impulsiveness.

DELUSIONS
Paranoid delusions may be secondary to a number of clinical syndromes, including schizophrenia, delusional disorders and other forms of neurological disease, such as dementia, delirium, acquired brain injury and other brain lesions.

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PAST, PRESENT & FUTURE

Since its birth 65 years ago as a veterans' hospital, Sunnybrook has come a long way. Here are some of the highlights in our colourful history – as well as our more recent work that is blazing the trail for a healthier tomorrow

Compiled by Celia Milne

1928 Alice M. Kilgour donates the Sunnybrook Farm to the City of Toronto, for use as a public park.

1937 St. John's Convalescent Hospital, now known as St. John's Rehab, opens its doors as the first Toronto-area facility to offer rehabilitative care.

1943 With the consent of the Kilgour heirs, the parkland is transferred to the Government of Canada to build a hospital for veterans.

1948 Sunnybrook Veterans' Hospital opens as the largest veterans' hospital in Canada, standing as a symbol of the nation's gratitude to its war veterans. William Lyon Mackenzie King visits to open the building.

1952 Members of the first graduating class of nursing students at Sunnybrook receive their nursing caps.

1955 The Holland Orthopaedic & Arthritic Centre is founded as the Orthopaedic and Arthritic Hospital by Dr. James E. Bateman and Dr. Charles S. Wright II.

1959 HRH Queen Elizabeth II visits Sunnybrook.

1966 Sunnybrook becomes a fully affiliated University of Toronto teaching hospital, serving the general public as well as veterans.

1970 The first Youth Psychiatry unit in Toronto is founded at Sunnybrook.

1973 Canada's first free standing Geriatric Day Hospital opens in H-wing.

1975 Sunnybrook establishes the first stroke unit in Canada. The MacLachlan Stroke Unit is way ahead of its time and helps to establish Sunnybrook's reputation as a leading centre for stroke care and research.

1976 Sunnybrook establishes Canada's first regional trauma unit to care for those with life-threatening multiple injuries.

1981 In its former location at 76 Grenville Street, the Perinatal Intensive Care Unit is declared the Regional High-Risk Pregnancy Unit, the first of its kind in Canada.

1982 The Toronto-Bayview Regional Cancer Centre (now known as the Odette Cancer Centre) opens as an arm of the Ontario Cancer Treatment and Research Foundation.

Early 1980s Sunnybrook introduces the first Carotid Doppler Ultrasound service in Canada, to detect symptoms of carotid artery disease.

1988 In its former location at 76 Grenville Street, the Sunnybrook Women & Babies program delivers the first test-tube quintuplets in Canada.

1989 Sunnybrook establishes a regional cardiovascular surgery and angioplasty centre.

1990 The hospital adds chronic care services to the community, building on the chronic and nursing home care provided to veterans.

1991 Major research facilities open, to house the rapid growth of research on campus.

Early 1990s The hospital is renamed Sunnybrook Health Sciences Centre, recognizing the importance of teaching and research excellence. This academic strength helps Sunnybrook provide the highest-quality patient care.

1993 The first international Digital Mammography Development Group is formed, led by Sunnybrook scientists. The group will later lead dramatic advances in developing new technology to detect breast cancer.

1994 The Peters-Boyd Academy of the University of Toronto is established, to provide a focus for undergraduate medical education, including community agencies and partner institutions.

1996 Sunnybrook is one of the first in Canada to establish a protocol for the routine administration of tPA within three hours of onset of stroke; tPA is a powerful clot-busting drug capable of immediate reversal of brain damage within hours of a stroke. It is a milestone in stroke treatment.

1996 The Canadian Stroke Consortium is born, with its national headquarters and first chairperson housed at Sunnybrook. It is a national network devoted to stroke research.

1996 Launch of the Rapid Response Radiotherapy Program to provide timely pain and symptom management to patients with advanced cancers, a first in Canada.

1997 Sunnybrook research provides the first proof that using a cell phone while driving increases the risk of a motor vehicle collision fourfold.

1998 The Holland Orthopaedic & Arthritic Centre merges with Sunnybrook Health Sciences Centre.

1999 Imaging scientists develop the world's first method to image blood flow in the microscopic vessels of the muscle of the heart, in real time, a technique now used internationally to improve diagnosis of and treatment for heart attacks.

1999 The Canadian Brain Tumour Consortium is organized to develop and conduct clinical trials testing new therapies. This national organization is based at Sunnybrook.

1999 Sunnybrook opens the first Mild to Moderate Brain Injury Clinic in Canada.

2000 Sunnybrook researchers lead the first international multi-centre clinical trial to evaluate risks and benefits of

caesarean and vaginal birth for breech pregnancies. The practice-changing results show C-sections for breech pregnancies offer benefits for mother and child.

2001 Sunnybrook researchers discover, with collaborators at the University Health Network and Osaka University in Japan, a protein in human breast milk that stimulates the immune system of newborns.

2001 The hospital becomes the Regional Stroke Centre for the North and East GTA region as part of the Ontario Stroke Strategy.

2002 The world's first system to generate T cells – a vital part of the immune system – is created in a Petri dish.

2003 St. John's Rehab launches Canada's only electrical injury rehab program.

2003 Sunnybrook co-leads the practice-changing letrozole trial of postmenopausal women with breast cancer, which finds that this drug reduces the risk of recurrence of breast cancer by over 40 per cent for women who had taken the drug tamoxifen for five years.

2004 In the first large, multi-centre clinical trial of its kind, researchers provide evidence to suggest that artery grafts from the forearm should be used in place of vein grafts from the leg in heart bypass surgery.

2004 Studies show MRI detects more breast cancer tumours earlier, compared to mammography, ultrasound or clinical examination in women with the BRCA1/BRCA2 genes.

2004 Sunnybrook pioneers the world's first breast cancer treatment that implants small beads of palladium, a low-dose radioactive material, in patients in a one-day outpatient technique.

2005 A new system is set up for stroke patients in which ambulances bypass the local hospital to transport all patients judged to be eligible for the drug tPA (within three hours of onset of stroke) to Sunnybrook or one of the other two regional stroke centres.

2005 Researchers report that patients treated with high-dose radiation for head and neck cancer in the morning have a lower risk of developing damage to the mouth and throat, than do patients who are treated in the afternoon, the first such study.

2005 Scientists predict for the first time, using neuropsychological testing, which study participants will develop Alzheimer's disease within five or 10 years.

2005 Sunnybrook heads the only Canadian site for the landmark DMIST (Digital Mammographic Imaging Screening Trial) which yields the dramatic discovery that digital mammography is better than film mammography for breast cancer early detection.

2006 Sunnybrook research finds that premenopausal women with HER2-positive breast cancer have better survival and lower recurrence rates when treated with anthracycline-based chemotherapy.

2006 Brain scientists take the lead in the largest-ever investigations of bright artificial light therapy for the treatment of winter depression, and studies comparing light therapy to medication in the treatment of major (non-seasonal) depression.

2007 Neuroimaging scientists discover the CT angiography "spot sign," the first practical imaging method to identify the highest-risk stroke patients with bleeding into the brain. The finding has been adopted worldwide and forms the basis of a new emergency treatment protocol for stroke patients.

2007 Sunnybrook leads an international study that shows magnetic resonance imaging can improve the detection of hidden cancers in the opposite breast of women diagnosed with unilateral breast cancer.

2007 Discovery: the expression of a certain gene predicts which prostate cancer patients are at highest risk and therefore most likely to benefit from treatment.

2007 Sunnybrook launches the SHARE (Sexual Health and Rehabilitation) Clinic.

2007 Sunnybrook brain scientists are the first in the world to find and identify the fundamental waveform

of dreaming sleep, providing possible links to learning and memory, potentially important for conditions such as stroke.

2008 The Canadian ALS Network becomes the first organized national network dedicated to developing and conducting clinical trials testing new ALS therapies. CALS continues under the direction of Sunnybrook Brain Sciences leaders.

2008 Sunnybrook researchers through the Crolla Research Unit and the Canadian Brain Tumour Consortium network, lead the world's largest clinical trial testing the use of daily (metronomic) chemotherapy in relapsed brain cancer, establishing this therapy as the global standard for treatment.

2009 Scientists invent and commercialize an ultrasound imaging catheter that can see inside heart chambers in 3-D in real time during heart procedures.

2009 Researchers provide the first evidence showing what the H1N1 virus looks like and that it hits younger and healthier people harder. This enables hospitals in Canada and around the world to prepare for and treat "high-risk" patients effectively.

2009 Sunnybrook's Schulich Heart Centre is the first in Toronto to perform minimally invasive, beating-heart bypass surgery.

2009 Sunnybrook leads research in circadian rhythms and "clock genes," illustrating that the timing of cancer treatment is important.

2009 Sunnybrook brain scientists are able to increase dreaming sleep by stimulating the area of the brain responsible for P-waves, advancing research using deep-brain recordings and stimulation to understand sleep, cognition and neurodegenerative disorders better.

2010 Sunnybrook launches the world's first dual-site-focused ultrasound surgery centre and tests the "scalpel-less" removal of uterine fibroids through high-intensity ultrasound, guided by MRI. Researchers in the centre will apply the technology, invented and commercialized by a Sunnybrook Research Institute scientist, to patients with breast, bone, head and neck, and rectal cancer.

2010 Researchers discover that a commonly prescribed antidepressant, paroxetine, interferes with tamoxifen therapy in women with breast cancer, and that other antidepressants of the same class do not.

2010 The Women & Babies program moves to a brand-new, two-floor, 120,000-square-foot facility at 2075 Bayview Avenue. As well as a birthing unit and new NICU, the facility houses a neonatal follow-up clinic, the most comprehensive and progressive program of its kind in Canada and the largest breastfeeding clinic in the country.

2010 Drano for Arteries: Schulich Heart Centre leads the first small clinical trial of a new treatment (investigational drug MZ-004) for patients with blocked coronary arteries. The findings are poised to change the way patients are treated, with a large multi-site, international clinical trial to begin later in 2013.

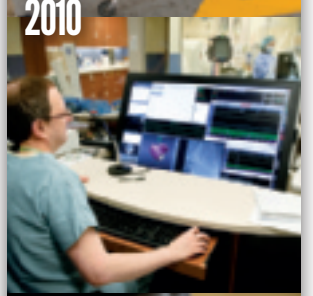
2010 The Schulich Heart Centre opens Toronto's first robotic arrhythmia lab, where patients with irregular heartbeats can receive minimally invasive treatment to restore normal heart function.

2011 Canada-first Rapid Results Prostate Biopsy Clinic launches to provide men with prostate cancer diagnosis within 72 hours versus the standard two- to three-week wait.

2011 Sunnybrook cancer surgeons use Xbox Kinect in the OR to view scans of the patient by making hand gestures without having to leave the sterile field around the patient.

2012 Sunnybrook leads the first study comparing blood vessel functioning of teens with bipolar disorder and teens who are healthy, to better understand the link between bipolar disorder and heart disease.

2012 Brain scientists use "scalpel-free" surgical treatment for essential tremor, using MRI-guided ultrasound — a first in Canada, and second in the world.



2012 Researchers, in collaboration with the University of Toronto, develop the first prostate cancer screening device that uses nanotechnology and prostate cancer-specific biomarkers to identify and distinguish between slow-growing and aggressive cancers.

2012 Sunnybrook helps usher in a new era in advanced breast cancer treatment using a new way to attach chemotherapy directly to targeted therapy. The EMILIA global clinical trial of women with advanced HER2-positive breast cancer shows improved survival and significant reduced toxicity over standard treatment.

2012 St. John's Rehab merges with Sunnybrook to build a comprehensive system of care, from acute care through to rehabilitation and recovery.

2013 Stroke specialists complete a world-first clinical trial demonstrating that a new method of home-based heart monitoring improves detection and treatment of one of the biggest risk factors for stroke, atrial fibrillation — a finding that could prevent thousands of strokes annually.

2013 Sunnybrook leads the *Twin Birth Study*, a nine-year international study, finding that delivering twins by planned vaginal birth is just as safe as delivering them by planned caesarean section, and that there is no significant difference in outcome between the two delivery methods.

2013 Sunnybrook shows for the first time that ultrasound can be used to monitor response of tumours as early as one week into chemotherapy in patients with locally advanced breast cancer. Standard PET or CAT scans typically take several months to determine treatment results.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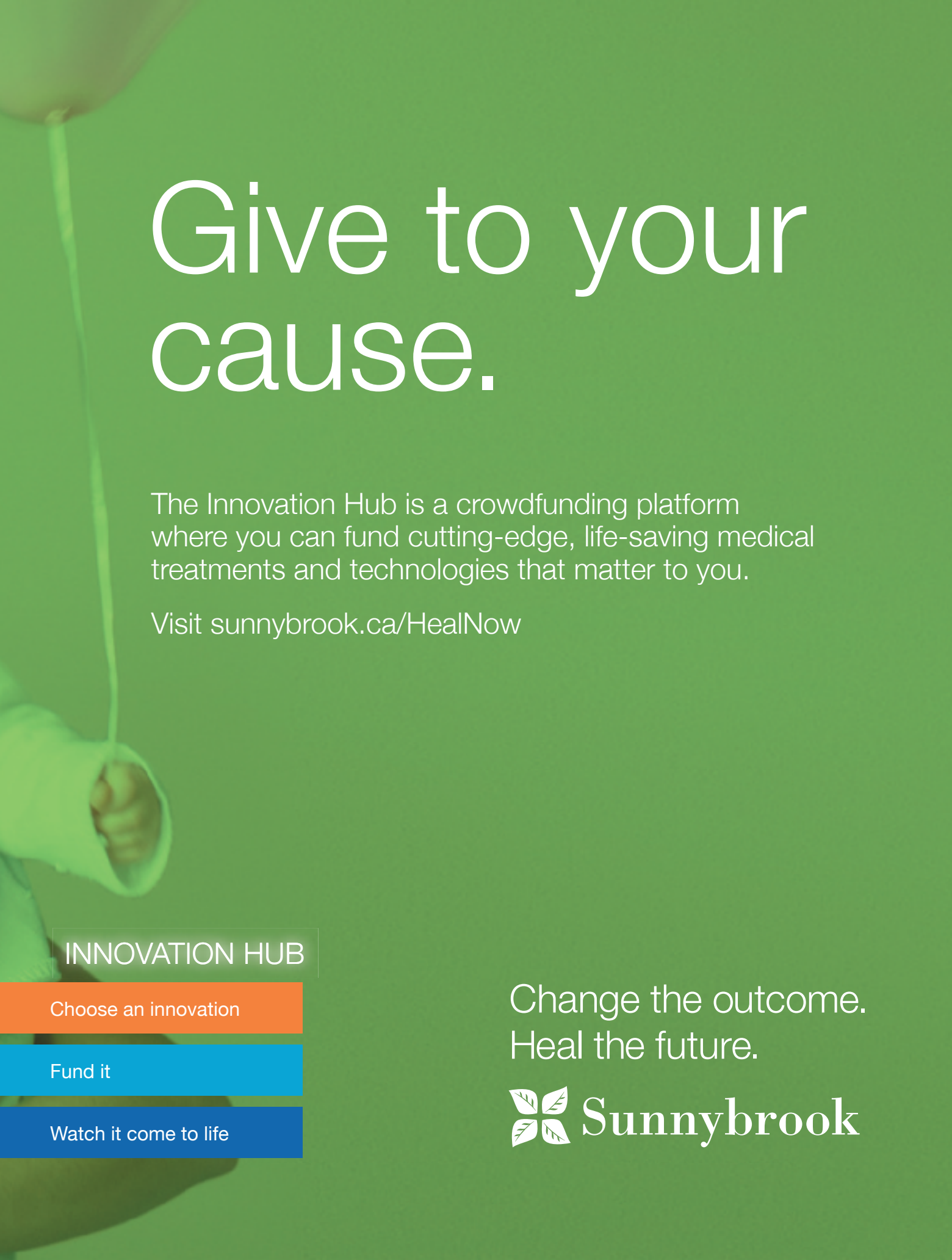
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"The simulation isn't meant to replace the participation in the operating room. It is meant to enhance it," says Dr. Shady Ashamalla, who trains staff in laparascopic surgery in Sunnybrook's Simulation Centre.

PHOTOGRAPH BY TIM FRASER

PRACTISING FOR PERFECTION

Lifelike mannequins, advanced technology and seasoned staff provide a range of simulations to make everyone from new nurses to surgical residents more confident and better trained

By Alexis Dobranowski

Mr. Clooney isn't responsive. He's recovering from emergency surgery after a motor vehicle collision. His breathing is slow – just six breaths per minute. When the nurse enters his room, she knows right away something isn't right. She calls her colleagues for help, and a group of four nurses enters the room. They look a little nervous. Understandably: It's their first day on the job.

What better place to work out the jitters than here: Nursing Orientation Day at Sunnybrook Canadian Simulation Centre. Mr. Clooney is a very real-looking, computer-operated mannequin, also known as a simulated patient. He has a pulse. He breathes, talks, moans and groans.

That is, when Susan DeSousa, Simulation Centre Co-ordinator, speaks into a microphone from the simulation control room. She also controls Mr. Clooney's vital signs, and determines how he reacts to the interventions.

"These scenarios always have a focus on teamwork and communication," DeSousa says. "There are other learning objectives. In Mr. Clooney's case it's about demonstrating respiratory and airway management, but there is always an element of communication involved."

New nursing hires at Sunnybrook are required to attend the simulation session as part of their corporate nursing orientation. In 2012, more than 250 nurses attended the simulation education day. It ensures that new staff understand hospital protocols, and practise essential elements of teamwork and communication with their colleagues.

Mr. Clooney's nursing staff safely administer the appropriate dose of a drug called Narcan, after they determine through various phone calls to the on-call physician and the rapid response team (also DeSousa in the control room) that he's having a reaction to the morphine he's been given for the pain. Narcan is the antidote. The patient's condition improves, the scenario ends, and the team regroups in the debriefing room.

DeSousa talks through the scenario with the participants, who admit it was challenging and hard to communicate with others, as well as the observers who've been watching the situation unfold via a video link-up. They go over each step, with DeSousa offering tips and reminders about how to make a situation like Mr. Clooney's run a little smoother: introduce yourself when you enter a room if you don't know your colleagues; delegate tasks by name or pointing. By the time the team is ready for its next scenario, it's clear they've taken DeSousa's advice to heart.

Critical care residents and fellow practise an ultrasound-guided procedure.

PHOTOGRAPH BY DOUG NICHOLSON

PRACTISE AND REPEAT

Established in 1995, the Sunnybrook Canadian Simulation Centre was the first of its kind in the country. Through hands-on experiential learning, the centre provides multi-disciplinary, advanced health-care education to all levels of learners, from medical students to long-time physicians. Simulation mannequins and other advanced technologies allow trainees to experience very true-to-life scenarios in a controlled environment, with the ultimate goal of enhancing patient safety. In 2012, 1,415 people attended education sessions in the simulation centre.

This year, it celebrated the opening of its new surgical skills suite, an expanded 800-square-foot skills centre where basic and complex surgical skills will be taught to trainees of all levels. Evidence suggests simulation is particularly useful in teaching reproducible situations or technical skills that are used often in surgery.

Dr. Shady Ashamalla, a surgical oncologist, leads the laparoscopic surgery program. He says that while the observed apprenticeship model he trained under is effective, there is room for improvement.

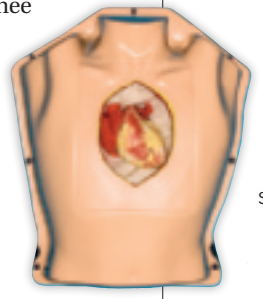
"When I was training, the attending surgeon showed the trainee how to do it and then increasingly allowed the trainee to try different tasks," he explains, adding there was classroom work and lectures. "Gradually, you do more and more, and soon you are doing the whole surgery, and soon after you are teaching it." Now, in addition to the observed apprenticeship, there's simulation.

"It used to be that simulation was something trainees could do in their spare time, if they had any," Dr. Ashamalla says. "The University of Toronto is the first general surgery training program in the country to include simulation in the core teaching curriculum. Trainees have always had teaching time with lectures and now we have integrated simulation into that."

Simulation sessions with Dr. Ashamalla focus on basic and advanced technical skills, like knot-tying in minimally invasive surgeries. "The goal is to create a pre-trained novice," he explains. "The simulation isn't meant to replace the participation in the operating room. It is meant to enhance it. No one would say to someone, 'Here's a violin, watch closely while I play it. Practise it once a week on your own and then you are going to perform a concert.'"

When Dr. Ashamalla's surgical trainees enter the operating room, they already have the basic skills. They are much more comfortable and confident, and therefore are much more prepared to learn.

"If a trainee enters the OR and their main focus is how to hold the instruments while the attending surgeon is teaching a more complex aspect of the surgery, the trainee will absorb very little of this," he says. "They are concentrating on holding the scalpel right. Through simulation, holding the instrument becomes routine for the trainee and so they can absorb the other important information from the teaching surgeon – and become more advanced. This improves their technical skill at a much more efficient pace. Whether it's swinging a golf club, playing the piano, landing a jet or removing a cancer, technical skill will always be dependent on intense practice and repetition, and there lies the value of simulation."



TECHNICAL CHALLENGES

For cardiac surgeon Dr. Fuad Moussa, using simulation to teach the highly technical off-pump coronary artery bypass procedure just made sense.

After a heart attack – caused by a narrowing or blockage in the arteries that supply blood to the heart – a cardiac surgeon builds a graft to go around the blockage and open the blood flow. Usually, the heart is stopped and the grafts are created. During off-pump coronary artery bypass (or beating-heart surgery) the cardiac surgeon builds the graft while the heart continues to beat on its own.

"It's highly technical and challenging," Dr. Moussa says. "Where I learned, 99 per cent of cases were done on a beating heart. To have the boss turn to you and say, 'Okay, now your turn,' it's overwhelming. When I came to Sunnybrook, I knew I would have to teach this procedure. I thought, there has to be a better way to teach this than the way I learned it. There just has to be."

Dr. Moussa set out to complete his master's degree in medical education and develop a better way to teach beating-heart surgery, using simulation. Working in collaboration with engineers from Colombia, and an educational scientist at the Wilson Centre for Research in Education in Toronto, Dr. Moussa mapped out the operation. The team analyzed the steps involved and found certain reproducible elements throughout the procedure. They arranged the tasks from the lowest level of complexity to the highest, then broke them into four different learning steps in a workshop. From there, Dr. Moussa worked with engineering students at the Universidad Pontificia Bolivariana in Colombia to build the beating-heart simulator.

"We were then able to conduct the workshop with surgical residents," he explains, "and found that the education using this framework for off-pump coronary bypass was effective and well-received by the participants." He has since received a grant through the Sunnybrook Education Research Committee to study it further with the hope it will be added to the cardiac surgery curriculum at the University of Toronto in the near future.

Post-graduate cardiac surgery resident Dr. Dimitrios Tsirigotis participated in Dr. Moussa's simulation session in August 2011. He was quite early in his surgical development at the time and reports the exercises were beneficial.

"The sessions served to make me feel more confident in that I left with a better understanding of some of the details associated with the procedure," he says. "Although it is difficult to judge the effect of a single-weekend exposure on my technical skills, I do feel that dedicated practice time with these techniques was helpful in making me more mindful of the technical nuances involved. The addition of simulation-based training techniques certainly augmented my educational experience, and I believe it can be used to optimize our training as residents."

Dr. Tsirigotis is now focusing his own academic efforts on surgical education with an emphasis on simulation-based training for technical skills. This past summer, he designed and implemented a boot camp for junior cardiac residents so they could get up to speed with some of the basic technical skills. He also worked with a larger team to design and conduct a preparation camp for incoming surgical residents.

Back in the simulation centre, Mr. Xu has extremely low blood sugar – he's moaning and groaning. A nurse enters the room, confidently introduces himself, and when Mr. Xu doesn't respond, he calls to his colleagues.

This time, a group of nurses enters the room. They introduce themselves one by one and each goes to task. Soon, Mr. Xu's blood sugar is back to normal. A voice over the speaker says: "Simulation over. Great job, everyone. Thank you."

The nurses can begin their first shift in their new workplace with clarity and confidence.

SIMULATION CENTRE: training for the unthinkable

Simulation plays a key role in training for extremely rare situations or cases that can't be reproduced.

"This is often compared to the aviation industry. Pilots train hours and hours for various complex crash scenarios through simulation," says Dr. Shady Ashamalla, a surgical oncologist. "No one would ever crash a plane just so they could practise landing, and most pilots won't ever have to face the crash situation in real life. But, through simulated emergency scenarios, they are trained in these rare events so that should a crash ever occur, they can reach deep in their memory bank and respond appropriately."

A similar approach is now used to train new as well as experienced surgeons.

"There are complex situations in operating that I'm grateful to have never faced," Dr. Ashamalla says, "but should these scenarios arise, I would want to have practised or rehearsed this situation and be ready to spring into efficient action."

Cardiac surgeon Dr. Fuad Moussa agrees. He is in the midst of creating simulation scenarios for the cardiac surgery team based on extremely rare catastrophes. The surgeons, residents, anesthetists and nurses will all participate, he says. "People always say, 'Practice makes perfect,' but it's actually, 'Perfect practice makes perfect.' Simulation has such tremendous potential for education and training."

Printing skin

It sounds like science fiction, but Sunnybrook researchers have developed a machine that produces human-like skin to treat burns

BY CELIA MILNE

It's an incredible concept: Doctors printing out skin from a machine whenever burn patients need it. It might sound like science fiction, but for researchers at Sunnybrook, producing human-like skin is becoming a reality.

"Our vision is to add the cells of burn patients to the device and have it print out skin that is the colour of their skin, with sweat glands, hair, dermis, epidermis – mimicking their own anatomical skin," explains Dr. Marc Jeschke, medical director of the Ross Tilley Burn Centre at Sunnybrook. If it pans out, he adds, the device should be capable of producing "a whole body's worth of skin in four to five hours." For the millions of people around the world who suffer burns each year, "it could change the game on how we practise wound care."

Right now, repairing skin in burn patients involves surgically removing patches of skin from elsewhere on their body and grafting the transplanted skin onto the wounds. This is a particular challenge when a patient comes to a hospital with a burn to, say, 30 per cent of their body. "They need 15 to 30 per cent from other parts of their body," says Dr. Jeschke. "That makes them sicker and increases their wound size." The Ross Tilley Burn Centre admits 250 patients a year, and Dr. Jeschke estimates between 70 and 80 of them have serious enough burns that they would benefit from this skin regeneration technique. "It would improve their quality of life and reduce their length of stay in hospital," he says.

The skin printer is just one exciting area of research for the Ross Tilley Burn Centre's laboratory of skin research. The laboratory has three main points of focus. One is skin regeneration, and the skin printer is part of that. The other two areas of study are metabolism and immunity. When a patient is burned, their metabolic and immune systems may go into hyperdrive, causing life-threatening illnesses, so scientists are looking for better ways to control these internal problems. The lab is a beehive of activity, as a growing number of scientists and students from around the world gather to seek ways of helping burn patients.

The skin printer itself looks a bit like an ordinary inkjet printer with a lot of tubes leading into it, but it is anything but ordinary. It was developed in the lab of Dr. Axel Guenther, a professor in biomaterials and biomedical engineering at the University of Toronto, which is affiliated with Sunnybrook.

Here's how it works: Special solutions are fed into the computerized machine

Dr. Marc Jeschke says the new skin printer (below) should be able to produce "a whole body's worth of skin in four to five hours."

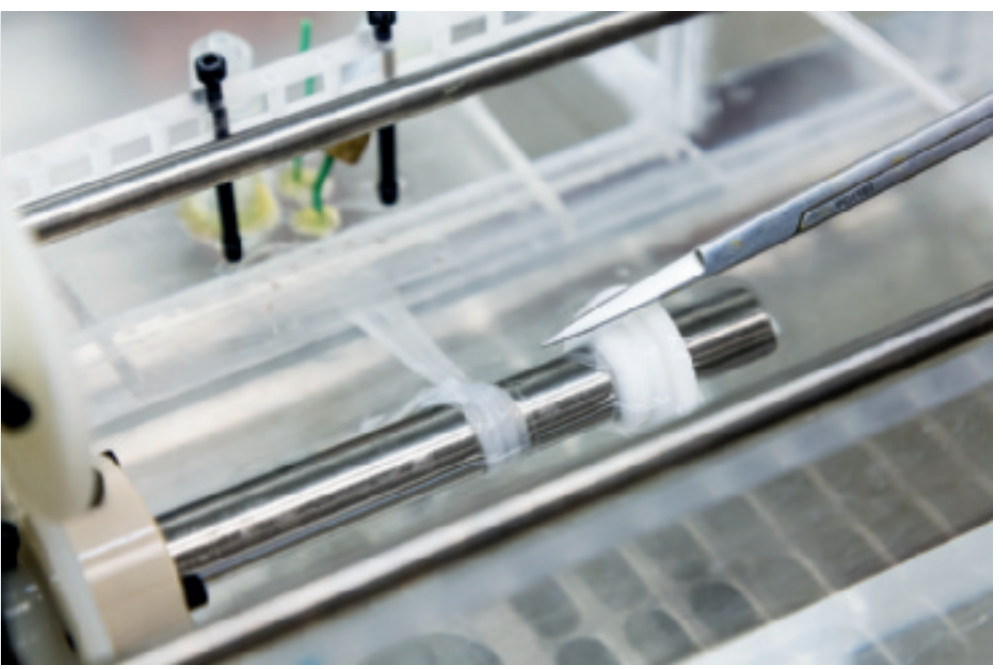
Opposite: Petri dishes containing the artificial skin.

through little wells or chambers, and the liquids are blended together. Basic ingredients include calcium chloride and a form of algae, the chemical building blocks of skin. When this gel-like substance is spun around a spool, it creates fibres that serve as the skin scaffolding or netting. This skin matrix is collected on a drum, like paper towel on a roll.

Under Dr. Jeschke's leadership, scientists at the Ross Tilley Burn Centre's laboratory of skin research are hard at work to take the skin printer to the next level: finding the ideal combination of stem cells to add to the scaffolding to make layers of skin. "We're working on finding out what kind of stem cells to put in the machine, and the architecture of those cells," says Saeid Amini-Nik, a skin stem cell biologist at the lab.

What sets this skin printer apart from similar technology is that the stem cells seed right into the scaffolding as it's being created, and therefore organize themselves as they would in natural skin.

Dr. Jeschke's vision is to begin clinical trials in two years. "It is exciting," he says. "Initial results have been fascinating and very positive. I'm very convinced we'll be successful. Our preliminary data is very strong."



INSIDE THE ROSS TILLEY BURN CENTRE

The majority of those Ontarians who experience the pain and trauma of a burn are cared for at the Ross Tilley Burn Centre. Many of them are from outside the Greater Toronto Area, arriving by helicopter or ambulance.

Once there, patients are met by a team of nurses, doctors and other staff members who are specially trained in treating burns. Carefully calibrated pain medication is used to keep them comfortable throughout their ordeal.

The centre is the only burn program of its kind in Ontario, providing comprehensive care from the time of admission, to surgery, wound care, rehabilitation, psychology and reconstructive surgery.

The centre is named in honour of Dr. Ross Tilley, a highly skilled Canadian burn surgeon and pioneer in the treatment of burns during the Second World War. Dr. Tilley received the Order of Canada in 1982 for his contribution to burn treatment and plastic surgery.

The work of the Ross Tilley Burn Centre is globally recognized. It is the only burn centre in Canada to have received accreditation by the American Burn Association, a gold standard for burn care.

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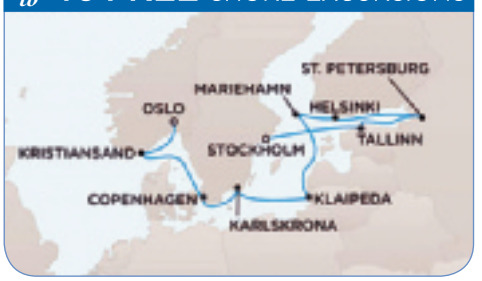

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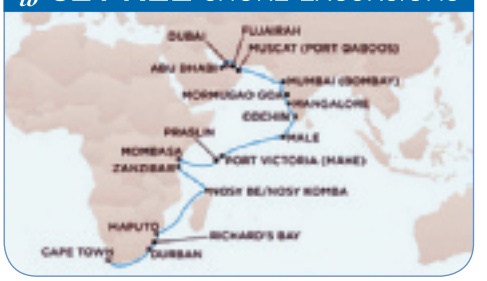

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PHOTOGRAPH TIM FRASER

Emergency delivery

It isn't always the babies who face risk in complicated pregnancies. One mother says she owes her life to Sunnybrook's expertise

BY WENDY GLAUZER

Myla Lopez, 41, was 36 weeks pregnant with twin girls when she told her husband, Joel, that she had a headache. She went to bed. Hours later, Myla was making strange noises in her sleep, and her breathing seemed strained. Alarmed, Joel tried to wake her. When she wouldn't wake up, he called 911, and Myla was rushed by ambulance to a local hospital.

"They did a scan … the doctor told me that there was nothing they could do and she wasn't going to recover," says Joel, who had been pacing the waiting room with Myla's sister and 18-year-old daughter. They had found a blood clot in Myla's brain. "I was crying my eyes out," he says.

Just as he was taking in this horrible news, a nurse touched Myla's arm, and the doctor and Joel both saw her hand flutter. "Wait a minute," the doctor said, circling around her body, and tapping her knees and elbows to test her reflexes, which were strong. "There's a chance."

That "chance" was at Sunnybrook, where neurosurgeon Dr. Leo da Costa was on call at his home when he was awoken by a 6 a.m. phone call. He received word about a pregnant, unconscious patient with bleeding and swelling in the brain who was about to be taken to Sunnybrook. It was Myla.

Dr. da Costa immediately got into his car and started making calls on his hands-free set. He knew Sunnybrook was the best place for Myla. "I said, 'She's not going to find the care she needs anywhere else but here,'" he recalls. One of the few Greater Toronto Area hospitals with both neurosurgical and obstetrical expertise, Sunnybrook is renowned as the go-to hospital for complicated trauma cases, especially those requiring outside-the-box thinking.

By the time Dr. da Costa arrived, Myla had been taken to Sunnybrook where there was an operating room and an anesthesia team in place. In just over half an hour, the 14-member team was ready – including obstetricians, neurologists, anesthetists and two teams of three for the twins. Their first priority was to try and save Myla, then her baby girls.

Before Myla was wheeled in, Dr. da Costa with obstetrician and gynecologist Dr. Howard Cohen ran through a series of "what ifs" and made a game plan. There were competing factors to weigh. If high blood pressure was causing the clot, it may be better to birth the babies first. But a caesarean section could also cause a sudden drop in blood pressure, and

PHOTOGRAPHS BY TIM FRASER

Dr. Leo da Costa (above, and below, in surgery) led the crainiotomy that saved Myla Lopez, pictured with husband Joel at right, and allowed the safe delivery of twins Jamie and Samantha.

Myla's blood pressure needed to be high enough to pump new blood and oxygen into her brain. "It was a delicate balance," says Dr. da Costa. In the end, they decided to start with a craniotomy – which would reduce the pressure in the brain caused by the clot – and immediately move on to the C-section.

Dr. da Costa met Myla's family in the waiting room. He told Joel there was a significant chance Myla would never wake up, or would survive with permanent brain damage, even paralysis.

To perform the craniotomy, Dr. da Costa temporarily removed a piece of the skull so that the brain could swell out and pressure could be relieved. "The head wasn't even closed and the belly was being opened," explains Dr. da Costa. The girls, Jamie, just under six pounds, and Samantha, just under five pounds, were immediately ventilated and rushed to the Neonatal Intensive Care Unit (NICU).

By that time, Myla's grandmother, friends and cousins had arrived, and they were joking about how Jamie looked so chubby compared to skinny Samantha.

"I was half and half," says Joel. "I was so happy to hold them, but I still didn't know what would happen to Myla … we wouldn't know until she woke up."

Miraculously, three days later, Myla's left eye opened (her right was still swollen shut from surgery). "It was like nothing happened," Joel says. Her memory was unaffected, and as the days progressed, she made it clear that she was back to her usual, strong-willed self.

"She was surprised when we mentioned she has two beautiful babies, and she was a bit upset, because she always wanted to have a natural delivery," recalls Joel, smiling.

After a week, the nurses brought the babies to the critical care unit to meet their mother. "Everyone was clapping," recalls Joel.

Myla's recovery exceeded everyone's expectations. "It was enlightening. She'd improved so remarkably in such a short span of time," says Dr. Cohen.

Joel credits Myla's desire to take care of the babies, as well as the care she received for her miraculous transformation. "On every unit, on all the floors we went through, the staff were all offering their help," recalls Joel. "They would say, 'Anything you need, you tell us.' I felt like I was home there."

For Dr. da Costa, Myla's case demonstrates how quickly Sunnybrook's teams are able to mobilize, and how well they collaborate across multiple departments. "There are very few hospitals in Canada where the routine is the exception. Trauma and emergency are the rules here," he says. "If you ask for something out of the box, everyone's willing to go along with it."

"Trauma and emergency are the rules here. If you ask for something out of the box, everyone's willing to go along with it."

Dr. Leo da Costa
Sunnybrook neurosurgeon

Three weeks after the 911 call, Myla, a clinic assistant at Toronto's Women's College Hospital, passed all the physiotherapists' tests and was able to go back to the family's Woodbridge, Ont., home. Now, the only thing she complains about is feeling tired, notes Dr. da Costa. "I think with twins you would be tired anyway," he adds.

However, just being with little Jamie and Samantha is all Myla needs to forget about her fatigue. "Just seeing them is a joy, seeing them grow, and coo and start talking to you and start smiling at you," she says.

A vision to help

Sunnybrook ophthalmology staff volunteer in Nepal to train doctors and nurses on the most complicated state-of-the-art equipment, as well as the simplest procedures that can save eyesight

BY TAMARA BALUJA

Before travelling to Kathmandu on a volunteer trip last May, Sunnybrook operating room nurse Sabrina Rafaeli and Chief of Ophthalmology Dr. Peter Kertes expected to find a hospital "60 or 70 years behind the developed world," admits Rafaeli.

To their surprise, when they arrived at Tilganga Institute of Ophthalmology in Nepal, they actually found a hospital that was well-equipped. But there was a catch.

"They have all the equipment … they needed help improving and expanding their surgical techniques," says Dr. Kertes.

He specializes in the diagnosis and treatment of diseases of the retina, and has a particular interest in the realm of pediatric retinal diseases such as retinopathy of prematurity. Dr. Kertes has volunteered his time all over the developing world.

Over the course of the week, Dr. Kertes trained two Nepalese ophthalmologists while Rafaeli worked with three nurses on the operations of 12 children. They were on a volunteer trip to train medical staff in specialized eye health care that was sponsored by ORBIS, an NGO dedicated to treating blindness and saving sight worldwide.

"The truth is that there are sources, often charitable organizations like ORBIS, that give hospitals such as Tilganga access to the latest and greatest equipment," Dr. Kertes explains, "but the equipment sometimes comes without the necessary training to teach them how to use it."

For example, surgeons in the west frequently make use of a BiOM, a device that is attached to the microscope that provides a three-dimensional view of the retina to its very periphery.

"They had one of these at Tilganga," recalls Dr. Kertes, "but no one there had any experience with it and didn't really know how to use it. I was able to show them how to attach it to the microscope and how to use it. The looks on their faces when they were able to visualize the retina the way we do routinely was priceless."

Sometimes it's not even that complicated. The operating room in Tilganga had two beds side by side. Having fewer resources in Nepal, surgeons would share surgical instruments between patients.

"They wouldn't change gloves or gowns between patients," explains Rafaeli. "There was inadequate sterilization

> *"The looks on their faces when they were able to visualize the retina the way we do routinely was priceless."*

between patients. I was overwhelmed by that." So, Rafaeli explained sterilization methods to Nepalese operating-room nurses. "Sterility is not so front-of-mind with them," adds Dr. Kertes. "Here in Canada, we can afford to throw things away and, yes, it's very wasteful, but there are some basic standards that should be maintained." Dr. Kertes says the staff at Tilganga would lay out all the surgical tools, even the highly specialized ones that would not be needed for the particular surgery performed that day. "One of the things we talked about was making packages of specific instruments for specific kinds of surgeries," notes Dr. Kertes. "That way you can be more efficient and conscious about sterilization."

Dr. Kertes says he would encourage the Nepalese surgeons to think about their goals, then modify the surgery based on those goals. "We talked about doing what was necessary, and not just following a set template for surgery."

Compared to working in Canada, surgeons in Nepal would see far more trauma-related issues in children who, for example, get foreign bodies in their eyes from hammering metal.

"So, as an ophthalmologist who sees that kind of trauma," says Dr. Kertes, "your role is to encourage public health advocacy like wearing safety glasses. Hopefully we conveyed that message as well. I really have to commend the doctors in Nepal for being forward-looking and wanting to be prepared for the future," he adds.

Both Dr. Kertes and Rafaeli say they still keep in touch with the surgeons and nurses back in Nepal. "We still talk to them on Facebook and exchange e-mails," Rafaeli says.

"Ophthalmology is so visual," adds Dr. Kertes. "Unlike our colleagues we can directly see what is wrong without having to rely on other tests like X-rays or CT scans. This lends itself well to consultations through e-mail or over the Internet."

Rafaeli and Dr. Kertes also highly encourage other health-care professionals to volunteer abroad. "If you ever get the opportunity to do something like this, take it," urges Rafaeli. "The contribution it makes to your soul is well worth the experience."

Dr. Peter Kertes sees pediatric patients at Tilganga Institute of Ophthalmology in Kathmandu last May.

CLOSER TO HOME

One of Dr. Peter Kertes' major projects is working with Sunnybrook's Women & Babies Neonatal Intensive Care Unit (NICU) to prevent the onset of retinopathy of prematurity, a disease that is one of the most common causes of blindness in premature children.

He screens the infants at the NICU at least once a week and also works closely with patients at The Hospital for Sick Children in Toronto. "The exam usually takes 10 minutes, but it can be harrowing for parents," Dr. Kertes says.

"They've had so much bad news and this disease appears always toward the end," he adds. "It takes time to develop and then you have to break the news to them that their child might become blind."

In the last few weeks of pregnancy, blood vessels grow from the central part of the retina outward. But in premature babies, the process is incomplete. If the blood vessels grow normally, the disease will not take root. However, if there is scarring and the blood vessels grow abnormally, the infant will develop retinopathy of prematurity.

"Sunnybrook has the largest level 3 nursery in Toronto, which means they see the sickest and smallest babies," Dr. Kertes notes.

The treatment is fairly straightforward with a high rate of success and can be treated with laser or an injection directly to the eye.

PHOTOGRAPH BY TIM FRASER

Honouring his memory by conquering kidney cancer

Thrill of the Grill organizer Susan Puff helps raise nearly $50,000 for Sunnybrook research

BY MARLENE HABIB

Susan Puff has funnelled several parts of herself – her formidable energy, her event-planning expertise and her desire to honour the memory of her beloved husband – toward a Sunnybrook event that benefits other people.

Susan is the executive director of the Danforth Business Improvement Area (BIA) (in Toronto's Riverdale community), which hosts the Thrill of the Grill rib competition. The annual event has raised nearly $50,000 for the Odette Cancer Centre's research into kidney cancer since 2012 when Ross, an acclaimed TV editor, lost his battle with the disease.

Susan admits that helping her husband to fight this disease was hard: "I was scared. I didn't want him to die. With every drug we tried, I just wanted more time. I was greedy."

Ross's cancer was caught at an advanced stage, which is common since the disease may not reveal symptoms early. However, through the work of Dr. Georg Bjarnason, an Odette Cancer Centre medical oncologist and a world leader in evaluating new therapies for advanced kidney cancer, Ross was able to continue the job he loved as senior editor of Shaw Media's specialty channels. He endured surgeries and drug therapies that extended his life four years after his diagnosis, double the original expectation.

Ross passed away on January 15, 2012, at age 46. Susan credits her husband's courage, sense of humour, the love and support of good friends and Ross's deep bond with Dr. Bjarnason and the Sunnybrook team for giving him the will to push the envelope of life. "Ross wanted to continue working and to maintain a good quality of life as long as possible. So, when it came to ourselves and our team at Sunnybrook, everything revolved around this wish," says Susan.

A LOVE STORY

Work preoccupied Susan, too. Before Ross came into her life and after university, Susan worked in public relations, then became head of events for the City of Toronto's 1996 summer Olympics bid. She then moved into fundraising events and media relations at the foundation for the Holland Orthopaedic & Arthritic Hospital (now part of Sunnybrook).

One day while unwinding with co-workers at a downtown pub, Susan met Ross, who was then a CBC employee. They played pool and threw darts, and Ross soon asked her out. "At that point, I had gone out on some disastrous dates with other guys and I thought, 'Geez, here's another crazy guy who drives a motorcycle and keeps telling the same joke over and over until you finally have to laugh … I don't think so!'" They married in 1995.

Several years later, as Ross's career was flourishing, he went to his family doctor, because he was having difficulty urinating. His doctor referred him to a specialist at Toronto East General Hospital who discovered a large tumour "the size of a small loaf of bread," as Susan describes it, on his kidney. Even worse, the cancer had already spread to his lung.

After surgery to remove his kidney, Ross was referred to a clinical drug trial, led by Dr. Bjarnason at Sunnybrook. The aim of the trial was to slow the growth and reduce the size of the inoperable lung tumour. Dr. Bjarnason later became Ross's full-time specialist, a relationship that blossomed into a great friendship. Dr. Bjarnason's work bought Ross time, but couldn't save him.

IN LOVING MEMORY

After Ross's passing, Susan began dedicating her time to realizing her late husband's dream of supporting the fight against kidney cancer. She did it by fulfilling another mission: promoting the restaurants and businesses in the dynamic Danforth BIA.

The Danforth BIA launched Thrill of the Grill four years ago to promote the area businesses, but two years ago the annual rib competition was transformed into a fundraiser for the Sunnybrook Foundation.

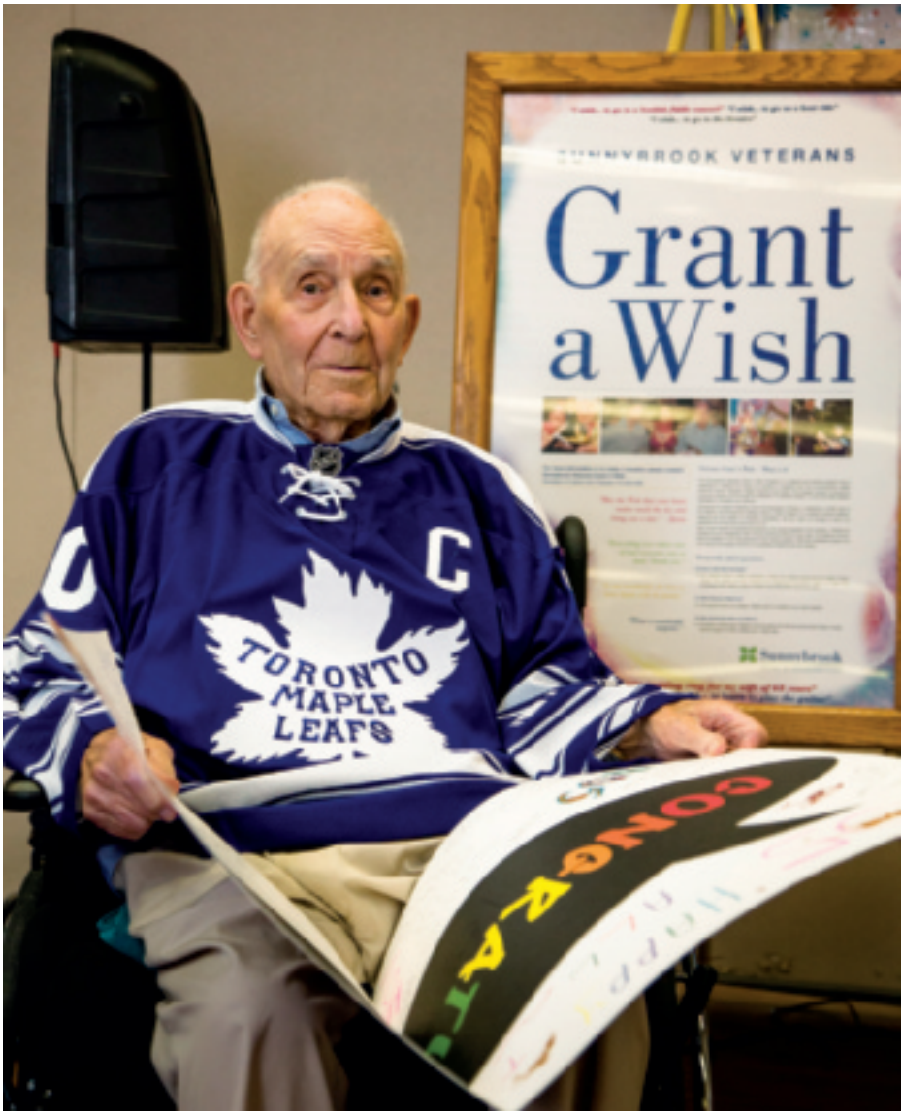
She explains: "Ross would often say, 'I am so grateful for this team here at the Odette. I wish I would win the lottery and I could give them money to make their life easier and help Dr. Bjarnason with his research.' He'd say to me, 'Maybe one day you could do an event for them.' He died in January 2012, and Thrill of the Grill was coming up in July. The board of directors of the Danforth BIA said they would like to make it in memory of Ross."

"Ross would often say, 'I wish I could win the lottery and give them [Odette Cancer Centre] money to make their life easier.'"

The fact that Ross used to volunteer for this event, explains Susan, makes Thrill of the Grill as an event even more meaningful, boosting an important philanthropic component, namely "to help raise awareness and a little bit of money for this bizarre cancer that not a lot of people know about, but that a lot of people get." According to the Canadian Cancer Society, kidney cancer is expected to claim 1,750 Canadians in 2013.

Dr. Bjarnason, Food Network Canada celebrity chef Lynn Crawford, and co-sponsors Pfizer Oncology and Baxter Corporation were among volunteers at the July 2013 Thrill of the Grill, which attracted about 1,500 people, raising about $22,000.

Susan calls the nearly $50,000 raised over two years for Odette's kidney cancer work "an amazing start," but adds, "I really want to reach the million dollar mark. It would be like winning the lottery for kidney cancer research and awareness." For more information on the Thrill of the Grill go to www.thedanforth.ca.



At 105, he's still got game

The Veterans Centre scored big when it granted James Houston the perfect hockey-themed wish

BY CHANTAL BRAGANZA

Three years ago, James Houston's wish was granted: a flat-screen television for his room at the Sunnybrook Veterans Centre, where he's lived since 2006. A consummate hockey fan, Houston loves to follow the game, though lately his eyesight hasn't been top-notch and it's been hard to follow the puck on the screen, explains his son Braden Houston.

And the wish-granting didn't end there. Last August, just before his 105th birthday, Mr. Houston was handed another gift. With family, staff and a few retired NHL players in attendance, Mr. Houston was presented a replica jersey of hockey legend Syl Apps and a framed photo from 1942, when the Toronto Maple Leafs captain steered his team to a Stanley Cup championship. For a lifelong Leafs fan, it was the ultimate present.

As Mr. Houston was wheeled into the Veterans Centre's balloon-festooned recreation room, he was at first overwhelmed by the group there to celebrate his 105th birthday, which included reporters from the *Toronto Star* and the *Toronto Sun*, hockey vets Jim McKenny and Bob Nevin and Mr. Apps's own son, Syl Jr. Once he was shown the blue-and-white jersey, though, Mr. Houston shouted in recognition, "Good number!" as he gazed in admiration of the big, white "10" on the jersey draped over his shoulders.

Ever the old-fashioned fan, Mr. Houston kept calling the jersey a sweater – a throwback to the days when hockey players actually wore the woollen garments. "This is one of the nicest things I've ever had," he declared as Braden helped him put on the jersey.

Both the television and sweater were made possible by the Sunnybrook Veterans Centre's Grant a Wish Program. Supported by donors and community sponsors, the program has granted over 850 wishes to the centre's 500 veterans since its inception in 2005. The concept is simple, and the impact meaningful. Residents are encouraged to write down wishes for anything they want most in the world – and anything really does apply here. Past wishes have ranged from hiring members of a local orchestra to accompany one veteran who was a professional singer, to purchasing an engagement ring for another veteran's wife on their 67th anniversary, to even treating a group of friends to a night out at a restaurant.

The program is part of an array of recreation and creative arts therapies that Nancy Bowers-Ivanski oversees at the Veterans Centre. "The goal of our service is to provide meaningful support to all the veterans as they try to improve their lives through leisure," she explains. Recreation, art, music and horticulture therapies are all aspects of the leisure activities the centre provides. This ranges from Friday night seminars, where experts lecture on topics such as botany or music, regular visits to Royal Canadian Legion halls, to yearly camping trips to Lake Joseph in Muskoka cottage country north of Toronto. "We are seeing a trend that the average age is 91 in the centre," says Nancy, "so we really have to work to adapt our programming to their age."

Recreation therapist Leanne Hughes co-ordinates the presentation of 11 wishes a month, designated either as "pearl" wishes (one per month is granted), or "gem" wishes (10 per month are granted). A veteran may be granted up to two

It was the realization of a lifelong dream when hockey fan and Sunnybrook Veterans Centre Grant a Wish recipient James Houston, 105, received a replica jersey of the 1942 Toronto Maple Leafs championship-winning team Captain Syl Apps.

wishes. "Some wishes are simple; others are larger in scope," says Leanne. "They are all, regardless, extremely special to the individual veteran who has made the request."

That's certainly the case for Mr. Houston, who played hockey in youth leagues while growing up in Toronto and Markham, Ont. As a teen in the 1920s, he'd earn extra money by getting up in the early mornings to fire up the furnaces of local stores and selling papers in the Beach neighbourhood for a penny apiece. By the time he was working as a linens and suits buyer at Eaton's (where he worked until retiring in 1973), Mr. Houston was an avid Leafs follower, in particular a fan of Mr. Apps. "He was business, all business," he fondly recalls of Mr. Apps. "I thought he was the best – a good man and a good player."

After moving to Scarborough, Ont., with his family, Mr. Houston would take his son Braden to hockey practice with the Toronto Marlboros junior team. In the early 1960s, Braden finished playing for the Marlboro Junior A's and then went on to play for the University of New Hampshire on a hockey scholarship. After graduating he participated in a Maple Leafs' training camp before playing professionally in South Africa and Germany.

Like Mr. Apps, whose son and granddaughter went on to play professionally, Mr. Houston comes from a hockey family. Also like Mr. Apps, Mr. Houston served two years in the Second World War, from 1942 to 1944. "My dad applied to the air force," says Braden. "At that time, he was 32, but they were looking for younger men. They told him he was too old." When Mr. Houston didn't relent, he was accepted into the Royal Canadian Air Force (RCAF) as a corporal, serving in the RCAF's Trenton, and Toronto, Ont., administrative offices.

Braden, who now lives in New York state, comes up to Sunnybrook every six weeks or so to see his father, who moved into the Veterans Centre from his Scarborough home after his wife, Lulu, passed away six years ago. Mr. Houston's favourite father-and-son activity now is what he calls "Christmas shopping" – heading to the local dollar store to see all the strange manner of things you can get for a buck these days.

"They take really great care of their veterans here," says Braden. "He's been around so long, but he's always kept himself very busy. He'll go to the musical events and tributes they have downstairs. He really appreciates it."

Just before the Veterans Centre staff got ready to cut Mr. Houston's birthday cake, Braden held out a framed photograph of the Maple Leafs' 1942 Stanley Cup victory, one of three that Captain Apps led the team to. As Braden explained to the assembled group how the Leafs lost the first three games to Detroit only to storm back with four straight victories to take the Cup, Mr. Houston nodded at the photograph and pointed to each of the players.

"Hey, Dad," Braden asked, "could you skate as fast as Apps?"

"Faster!" Mr. Houston replies, smiling.

OPERATION RAISE A FLAG

"We can never do enough to show our gratitude for all that our veterans have done for us," says Grant a Wish program facilitator Leanne Hughes. However, the Sunnybrook Veterans Centre's Operation Raise a Flag is certainly a great place to start. Imagine waking up to a sea of thousands of red and white flags from people all over the country, right on your front lawn.

Every fall, Sunnybrook invites citizens to purchase Canadian flags in recognition of the service and sacrifices our veterans have made. In the early hours of November 11, every flag is planted in front of the Veterans Centre to create a field of gratitude from across the country. Proceeds from the sale go toward the Veterans Comfort Fund, helping to provide veteran residents with the "extras" such as important equipment, special events and entertainment items that enhance their quality of life. For more information about purchasing a flag, visit raiseaflag.ca or call 416-480-4483.

RESEARCH & INNOVATION

the latest in leading-edge developments at Sunnybrook

A NEW JOB FOR A VETERAN DRUG

Most popularly known for its use in treating attention deficit hyperactivity disorder (ADHD), the drug methylphenidate (Ritalin) is now also being used by Sunnybrook brain scientists to decrease loss of interest and motivation in Alzheimer's patients.

Symptoms of apathy are some of the most common effects of Alzheimer's disease, worsening an individual's ability to carry out activities of daily living, and are often a key contributing factor to them being institutionalized.

"This research, supported by the National Institute on Aging," says lead researcher Dr. Krista Lanctôt, "aims to understand and treat effects of the disease for those who are diagnosed with it, so that one may have Alzheimer's, and yet we can try to maximize quality of life for that individual for a longer period of time."

The participants in this study not only showed a significant reduction in their apathy symptoms, but they also demonstrated improvements in attention and thinking. Previous research by this group led to the current treatment study: Those with apathy had a lower feeling of reward and, with various testing, researchers were able to link the brain reward system with improvement in apathy during treatment. Methylphenidate stimulates the reward system.

"This treatment appears to be effective with few side effects," adds Dr. Nathan Herrmann, head of Geriatric Psychiatry at Sunnybrook. "While more research is needed, it appears promising."

BREATHING TECHNIQUE HELPS CANCER PATIENTS

Who knew that the simple idea of a long, deep breath could make a difference for some breast cancer patients? For women with left-sided breast cancer, this breathing technique can better protect the heart from radiation exposure by separating it from the chest wall or treatment area. That protection goes a long way in reducing heart problems down the road.

"Patients with left-sided disease have increased risk, relative to patients with disease on the right, and we know cardiac complications can take up to 15 years to occur," explains Dr. Justin Lee, radiation oncologist at Sunnybrook's Odette Cancer Centre, who collaborates with medical physicist Dr. Claire McCann. "Shielding the heart during active treatment through this simple, but effective approach reduces women's risk of heart disease."

Active Breathing Control (ABC) is a technique that can significantly reduce heart volume exposure to radiation by as much as 58 per cent. Supported by radiation therapists and using special equipment, patients rehearse holding their breaths, each to a manageable threshold as controlled by the individual. Clinicians are now researching ABC together with SBRT (stereotactic body radiotherapy) a high-precision, high-dose radiotherapy to improve heart health for patients with left-sided, early-stage lung or liver cancer.

A PROSTATE CANCER KNOCKOUT

When you're fighting prostate cancer, it helps to think like a boxer. "If you're punching with a weak hand, you start provoking your opponent," says Dr. Andrew Loblaw, a radiation oncologist at Sunnybrook Odette Cancer Centre. "In the ring, if you don't finish them off, they'll keep coming back. Same with prostate cancer cells."

A few years ago, for most men, radiation treatment meant putting your life on hold, requiring patients to receive 39 radiation treatments in total, five times a week. That approach is history, with low-risk prostate cancer patients now needing only five radiation treatments in total, just once a week. Today, radiation treatment is given in higher doses and is more focused to target only the prostate cancer cells, not surrounding tissues. It's not only more effective, but also requires fewer patient visits.

"Prostate cancer's Achilles heel is that a high dose of radiation is more effective at killing the prostate cancer cells," says Dr. Loblaw. "By giving our patients a higher dose of radiation in fewer visits, the results are much better. Only 2 per cent of patients' cancer has returned at five years." This high-precision approach called SBRT is now the standard of care at Sunnybrook's Odette Cancer Centre, and the radiation treatment itself is quick; patients are in and out in roughly 20 minutes, with no hair loss, skin changes, vomiting or nausea. The vast majority of patients feel only mild or moderate temporary irritation to the bladder and/or bowel.

THE IMMUNE SYSTEM MAY IMPACT BONE FRACTURES

People may associate a healthy immune system with warding off colds and flus, but new research finds it can also help heal broken bones. Dr. Diane Nam, an orthopaedic surgeon and associate scientist in Biological Sciences and the Holland Musculoskeletal Research Program at the Sunnybrook Research Institute, along with her colleagues, studied how the musculoskeletal system and the immune system work together in mice. They found that the fractures of immune-compromised mice didn't heal as well as those of normal mice. Dr. Nam says these findings will hopefully lead to better fracture-healing techniques.

TINY WEAPONS AGAINST HEARING LOSS

Tiny hair cells found inside the cochlea help you hear and maintain your balance. But can these small but vital hairs grow back after they have been lost by injury?

Dr. Vincent Lin, associate scientist in the Brain Sciences Research Program at Sunnybrook Research Institute, led a recent study in which mice were given an antibiotic that resulted in hair loss and were followed to see if manipulating a particular cellular pathway known as the Delta-Notch pathway would cause new hair cells to regenerate. This process is known to take place in animals such as birds and amphibians that regenerate spontaneously.

The study found that mature mammals can regenerate hair cells through simple manipulation of the Delta-Notch pathway, opening the door to potential new hearing-loss therapies. •

Last word from the experts

Thinking about your health and well-being? Is it time to make some changes? Let Sunnybrook's experts help get the ball rolling. Here, they offer their top health tips, and the best piece of advice they've ever received

Dr. Clare Atzema
Emergency Physician

BEST HEALTH TIP
"Don't be afraid of medication. Medications are powerful, and when treated with respect and care, can be life changing in a positive way. While I used to avoid even taking acetaminophen, I realize now how wonderful it is that we have access to medications that can actually improve our health and quality of life."

BEST ADVICE
"This one is from my family doctor: get your flu shot. She gave me my flu shot and two weeks later, when all three of my children and my husband were prostrate, I was absolutely fine. I was a rock in the storm."

Dr. Gideon Cohen
Cardiac Surgeon

BEST HEALTH TIP
"You can't change your parents, so when it comes to heart disease, work on what you can change: Eat properly and exercise to help control your weight, your blood sugar and your blood pressure and avoid high-risk activities such as smoking."

BEST ADVICE
"Stay active. It will strengthen you both physically and mentally."

Angela Leahey
Advanced Practice Nurse, Breast Cancer, Sunnybrook Odette Cancer Centre

BEST HEALTH TIP
"Everything in moderation. In a society where there is a lot of confusion, controversy and conflicting evidence on what we should or shouldn't be doing in terms of our health, I think it is really important for all of us to remember that too much of anything can be harmful."

BEST ADVICE
"Risk versus benefit. Do the benefits outweigh the risks? Or do the risks outweigh the benefits? Knowing the answer to either of these questions helps with any challenging decision, health related or not."

Joanne Banfield
Manager, Sunnybrook RBC First Office for Injury Prevention

BEST HEALTH TIP
"I always carry disinfectant wipes with me. I use them when I travel (on the plane and in the hotel), when I'm shopping (to wipe down shopping cart handles), in restaurants, public restrooms, at conferences, meetings, etc."

BEST ADVICE
"A very wise man (my dad) gave me this advice: If you are ever in a position to affect positive change in people, always remember to 'practise what you preach.' You become a credible role model empowering people to change their behaviours. This is a principle I strive to accomplish in my everyday work."

Dr. Gordon Rubenfeld
Chief of the Trauma, Emergency & Critical Care Program

BEST HEALTH TIP
"Wear a helmet when you cycle, ski or snowboard."

BEST ADVICE
"Take a notepad to the doctor's office. Write down all of your questions before you meet and write down all of the answers. The stress of a doctor's visit makes everyone forget the most important things."

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