

# Sunnybrook

saving lives, one innovation at a time

## Saving Hailey

The critical care of tiny survivors

THE AMAZING STORY OF  
CANDACE, STROKE VICTIM

COULD STEM CELLS  
HELP HEAL BURNS?

FRESH THINKING ON  
BREAST CANCER CHEMO

OCTOBER | TWO THOUSAND AND TEN

 Sunnybrook



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OCTOBER 2010

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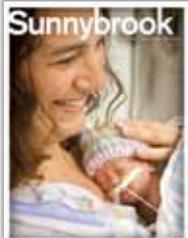
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**Sunnybrook**  
The cover photograph by Ryan Enn Hughes records the moment that Sandra Thompson was able to hold her daughter Hailey for the first time, about four weeks after the critically premature girl was born. Story on page 30.

# a window into your hospital

Maybe you've been a patient at Sunnybrook or know someone who has. Perhaps you're a donor, helping us give back to people the lives they want to live. Maybe you live down the street from us. Whatever your relationship with Sunnybrook, you are a part of the Sunnybrook community.

And I am, too. I'm a volunteer, along with three generations of my family. I've been a patient as have many of my family and friends. I'm also a donor.

Sunnybrook is my hospital. It's yours, too.

You need to know what happens in this world-renowned hospital. Why? Because you count on Sunnybrook to be there for you and the ones you love, when it matters most. You need to know about the latest treatments available. You need to know that we're working on the next great answers to life's toughest medical problems – like cancer, heart disease, trauma, stroke and babies born far too soon.

That's what this magazine is for. We want to keep you up to speed on what Sunnybrook is doing to ensure you have access to the best care possible. And, we want to show you how investments made in Sunnybrook are having a real impact on the lives of real people.

I hope you agree that this magazine gives you important information that's relevant to you. It was created with the support of sponsors and advertisers from our community. We thank them for their generosity. Because of them, no hospital funding was used to create this magazine. And that's important when every health care dollar needs to be spent wisely, where it's most needed – on you and everyone else who counts on Sunnybrook to be there for them – when it matters most.

This is your magazine. Please tell me what you think. Let me know what interests you and what you'd like to learn more about.

Just e-mail me at [jennifer@sunnybrook.ca](mailto:jennifer@sunnybrook.ca).



Jennifer Tory  
Chair,  
*Campaign for Sunnybrook*

# Sunnybrook

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THE EDUCATOR

# Training outside the box

If we or family members end up in intensive care, we'd all want the best-trained physicians treating us. But here's the dilemma: if we insist on the most senior doctors to ensure the best possible care, are the more junior residents learning enough?

This is the question concerning Dr. Dominique

Piquette, a critical-care physician at Sunnybrook who's doing her PhD at the University of Toronto on this very topic. "It's a timely issue," says Dr. Piquette. "Within the last couple of years, with the focus on patient safety ... there has been a push to get more senior physicians in-house 24-7."

Dr. Piquette's research starts in a simulation room, where residents are given a realistic critical-care scenario, including a talking, full-body mannequin and real Critical Care Unit (CrCU) nurses as actors. Her team records the action and gauges whether residents learn less if senior doctors do most of the patient care. The next step is to take what they've learned in the simulation room to a real CrCU and see if it matches what they've found.

It's time to update doctor training, she says, because the CrCU has changed while the training hasn't. Patients have more complex and serious illnesses, because people live longer and we have more means to keep them alive. Resources are limited and there are also complex issues around involving family in medical decisions.

"Medical education is still a young area of research," she says. "There are not a lot of studies on ... how physicians actually learn their work."



THE CARDIOLOGIST

# Plumber of the human heart

Ask Dr. Mina Madan what she does, and she laughs and says she is a plumber. But calling Dr. Madan, an interventional cardiologist at Schulich Heart Centre, a plumber is like calling Itzhak Perlman a fiddler. Yes, she clears blocked pipes, but in her case those are the arteries connected to the human heart.

Her main tool is angioplasty. She and her fellow interventional cardiologists take heart attack victims right from the Emergency Department and using hair-thin wires snake a catheter through the maze of arteries leading to the heart, locate the blocked section and inflate a tiny balloon. This creates a space to install a stent, a tiny version of a steel scaffold, which not only holds the plaque clinging to the artery walls in place but also creates a support structure to keep arteries open and blood flowing.

Just three years ago Schulich Heart Centre was performing about 45 such procedures a year. Heart attack victims were first treated with clot-busting drugs, and if they did not work, within an hour or so it was off to the angioplasty unit. "What we have found since is that angioplasty is far superior when it comes to dealing with heart attacks," she says. "Today we take patients straight into the unit and perform the procedure. This year we expect to do upwards of 400 of them."

The interventional cardiologists have been so successful in dealing with heart attacks that the mortality rate is now 10% or less. But while Dr. Madan regularly sees 12 to 15 patients a week, she also wears another hat - as director of interventional clinical trials, engaged in finding new and better devices, drugs and treatments for heart attacks.

Married to another cardiologist and with a daughter, 7, and a son, 5, Dr. Madan admits to being a bit of a jock. For relaxation she runs half marathons, burns up the tennis court and two years ago, prompted by the sight of her children splashing in the pool, learned to swim.

"This is an enormously exciting place to work," she says. "The advances we have made in treating heart attacks in the past half-decade or so have been absolutely astonishing."

THE VOLUNTEER

# The art of just being there

Although he has been volunteering at Sunnybrook for close to a quarter-century, if there's one thing Denis Milton doesn't want, it's to be thought of as noble.

At the age of 94, he drives to the hospital twice a week from his Thornhill home to bring comfort to terminally-ill patients at its Palliative Care unit. The volunteer visitor deals with both the dying and their distraught families. "Usually, they play the biggest part," he said of the families. "Yet there are people who are very elderly, like me. They've survived their friends or they've never married. They may have lost their wife. So they are the most lonely people in the world. I try to spend most of my time with people like that, who are very lonely and need some compassion, some presence in the room."

Mr. Milton moved to Toronto from Bristol, England, to teach graphic communications management at what was then

Ryerson Polytechnic Institute in 1957. Before his wife passed away in 1986 she had worried how he would fill his time when she was gone. He had suggested volunteer work, "just off the top of my head. And she seemed to heartily approve," he says.

Most of the time all he does is listen, says Mr. Milton. The hospital's Palliative Care Consult Team suggests patients with whom he might have some rapport. "I introduce myself and ask them if I can sit down. I ask them questions, whether they have any concerns, or sometimes I just say 'tell me about yourself,'" he says. "This is the approach, softly and quietly and if they're talking, to give them the opportunity to talk. I think it's wonderful therapy for a patient to talk."

Noble or not, Manager of Volunteer Resources Sally Lewis no doubt sums it up for many when she describes Mr. Milton as someone "who just makes my day."



THE NURSES

# Anatomy of the Grays



When colleagues of I.V. nurse Grace Gray are surprised to learn that not only she, but her mother and her daughter, all took up the same profession, she'll add with a laugh: "Yeah, but it's not just three generations of nurses. It's three generations of Sunnybrook nurses."

It's not only a source of personal pride, but an illustration of how the profession has evolved over the decades. That change "has been humungous," says Grace. "Now people think it's funny that my mother was part of the first generation of nurses who were allowed - allowed - to continue working after they were married."

This was in Jamaica, where Grace's mother, Veta Walker, graduated from nursing school in 1945. She immigrated to Canada in 1957 because "she always said she wanted to work at a hospital that had everything," says Grace, and joined Sunnybrook when it was still a veterans hospital. A great believer in continuing education, Veta took courses even as her career advanced.

Yet, says Grace, Veta recognized how demanding the job could be. "She'd say, 'I would never have wanted my daughter

to work that hard for a living,' she says. So while she studied nursing and worked part time, Grace also spent 17 years as an administrator at IBM. By 2003, however, she accepted a full-time position at Sunnybrook.

Grace's daughter Shawne, meanwhile, never had any doubts about what she wanted to do. "She always wanted to be a nurse," says Grace. "I ended up here kind of by accident, but she said she always wanted to work at Sunnybrook."

An oncology nurse at Odette Cancer Centre, Shawne "likes the fact that there's so much research going on here," says Grace. Shawne is co-chair of the Nursing Information and Technology Group, a committee that promotes change in the nursing process and nursing care.

Grace says: "When my daughter said she wanted to become a nurse - if I hear anybody say they want to become a nurse, I congratulate and encourage them because it is hard work, but I believe it's the highest form of service that as a human being you could provide, taking care of another human being."



## THE VETERAN

## The house that Norm built

It's a sweltering weekday morning, but inside Sunnybrook's Kilgour (or K) Wing, Norman Bell looks dapper in a navy cardigan and ascot. Seated in a wheelchair, the 89-year-old former stockbroker and World War II veteran could easily be taken for any other elderly resident on his floor. The difference is that it is largely due to him that they are all there.

When the hospital was transferred from the Department of Veterans Affairs to the province in 1966, then-premier John Robarts asked Mr. Bell to join its six-member Board of Trustees. "We were supposed to see that the veterans were looked after once the hospital was open to the public," he says. As a board member, however, he was frustrated as funds set aside in the transfer agreement for the construction of a new wing remained unspent.

The board at the time, he recalls, "decided that they would ask the DVA to let them have the money and they would build a wing for the hospital, but not for the veterans. The government was never going to agree to that. It was ridiculous. So the money sat there for six years!" In 1972, when Mr. Bell was made Chairman of the Board, he says, "I thought to myself, what's the first thing I'm going to do? Get the money. That's why this building exists." This year, that same building – Canada's largest veterans-care facility – became his home too.

As a young man, he still remembers going with friends from Upper Canada College to volunteer for military duty in 1940 and being told they had to finish their university degrees first. "It broke our hearts," he says. "Then the war got worse and they said they needed us. They said, 'we'll give you your last year and you go volunteer for the army.' Well, we were pleased as punch." By 1943, he was fighting alongside British General Montgomery's 8th Army with the 48th Highlanders.

## THE PHYSIOTHERAPIST

## The thinking person's physio

Since he was a small boy in the Philippines, Jeffrey Andrion knew what he wanted from life. He longed for a career that would see him helping the sick, especially those afflicted with pain. But he also wanted a career that would let him do research to better understand all the factors that robbed the sick and disabled of their quality of life.

Today Mr. Andrion, now in his thirties, is a physiotherapist with Sunnybrook's Holland Musculoskeletal Program. Thanks to financial support from Sunnybrook he has earned a masters degree from York University (focused on injuries caused by land mines), conducted research into the social implications of disabilities and co-chairs a University of Toronto sub-committee organizing a major international conference on the social impact of disabilities in Third World nations.

"Ever since I first landed in Canada in 2002, I dreamed of working at a wonderful teaching hospital like Sunnybrook," he says. "There is so much more to helping those disabled by illness or injury resume normal lives. Disabilities affect the way others look at you and treat you; they affect the way you look at yourself.

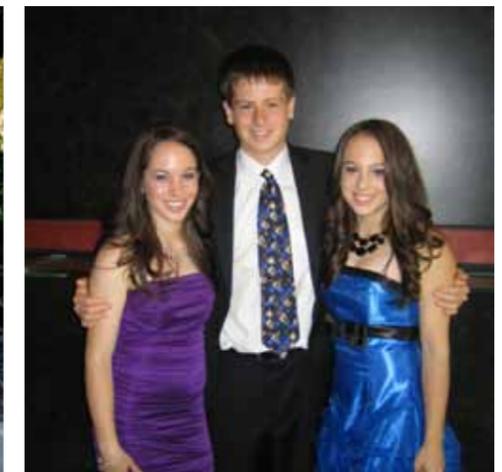
He adds: "Sunnybrook understands that rehabilitation involves much more than restoring physical functions. We must also treat the social and psychological impact disabilities have. There are very few places in the world where a physiotherapist like me can combine passion for research





## THE FUNDRAISERS

# From tiny customers to big benefactors



Beverly and Michael Wolfe will tell you that at Sunnybrook, medical wonders do happen. As proof they will trot out their triplets Amanda, Samantha and Jake. The kids will be 16 this December and how they came into this world is an amazing story.

"I am just a little woman, about 100 lbs.; you can imagine me hugely pregnant with triplets," says Beverly, an audiologist. "Everything seemed to be going well with the pregnancy but then 21 weeks along I started to go into labour. Michael and I were devastated – at 21 weeks the babies were not viable. We went to two downtown hospitals but all the doctors said I would just have to deliver and hope for the best."

Then the Wolfes were referred to Dr. Kofi Anankwah. He had her admitted and

for the next 13 weeks kept her lying on her side in bed, resisting other doctors' advice to start delivery. "He was amazing," says Beverly. "He did everything he could think of to prevent labour, then about 33-and-a-half weeks into term he wheeled me into the delivery room and the triplets were normal – each weighed in at about four pounds."

Respiratory problems kept the babies in incubators for three weeks, but once home it proved smooth sailing, with no complications. Just a trio of happy energetic healthy children.

Raised with tales of their dramatic birth, the triplets developed a desire to do something for the hospital that saved their lives. As their 13th birthday approached,

The Wolfe triplets through the years: from wonder babies, to toddlers, and now 15-year-old philanthropists.

they told their parents 'no presents'. Instead they decided to raise money to buy incubators for Sunnybrook's new Neonatal Intensive Care Unit.

The triplets raised an amazing \$32,000 through birthday gifts and fundraisers. The NICU now has their names on a wall plaque. "We just wanted to do something really good for Sunnybrook," says Samantha. After all, the hospital did something priceless for her and her siblings.



## HUMAN DRANO

Only months ago, totally blocked cardiac arteries left many patients in chronic, sometimes debilitating pain and without hope. This condition was often untreatable. Now, for some patients, an answer has been developed. And it works something like Drano.

Dr. Bradley Strauss, chief of Schulich Heart Centre, has developed a treatment that uses an enzyme, called collagenase. Once it's injected into the clogged artery it can soften the blockage. This allows a catheter to be threaded through the blockage. A stent is then inserted into the artery, allowing blood to flow freely. No one else in the world is performing this procedure. With further study, it's expected that Dr. Strauss's treatment will soon be available to people around the world.

## NOT A MOMENT TO WASTE

When a breast tumour is found, the goal is to get it out as fast as possible. Sometimes, the more aggressive ones are too large to be operated on. Often, chemotherapy is used to quickly shrink them to make surgery possible. This means that the shrinking effects of the chemotherapy must be closely monitored, sometimes difficult to do accurately.

Researchers at Odette Cancer Centre have developed a new imaging method that can effectively monitor tumour activity, as early as one to four weeks from the time it is treated. Diffuse optical spectroscopy measures infrared light absorption in tissue. This makes a map of the tumour that's used to monitor its response to chemotherapy. With this new, more functional imaging method, doctors can decide if the chemotherapy is working – making treatment more effective for individual patients.



## generation Y researchers

He's discovering new ways to kill cancer now, but when Sunnybrook researcher Dr. Rajiv Chopra was in high school, he couldn't have guessed that's where he'd end up. That's because no teacher was ever able to show him the possibilities. Dr. Chopra is on a mission to take bright high school students under his wing and get them started on their careers early.

Through a program called Talented Offerings for Programs in the Sciences (TOPS), and with the help of his peers and their teams, Dr. Chopra is bringing high school students from Marc Garneau Collegiate Institute in Toronto into the lab and giving them real working research positions. With access to the latest research technologies, Sunnybrook scientists are helping these teenagers become the next generation of medical researchers.

## where does it hurt?

When a baby weighs little more than a can of pop, the idea of that little one suffering any kind of pain is hard to bear. Until recently, it was impossible to know for sure. There are over 40 measures of pain in full-term babies, but for critically-premature babies there are almost none that are reliable.

Researchers in the Women & Babies Program are shedding light on this problem. Through a recent study, they were able to identify four facial actions present when the heels of pre-term babies were pricked. Their study highlighted that facial expression is only part of the puzzle. Another piece is body movements. A follow-up study is now underway to add to the measures medical staff can use to identify the pain experienced by our tiniest patients.



## tiny TUMOUR-TRACKING bubbles

Sunnybrook's Dr. Martin Yaffe has accepted a challenge – he's the co-leader of the Ontario Institute for Cancer Research's One Millimetre Cancer Challenge. The goal is to find cancer when tumours are one millimetre, the size of a head of a pin. In order to do that, he has to find cancers fast. Another Sunnybrook researcher, Dr. Peter Burns, is helping him to do that with micro-bubbles. These microscopic bubbles of gas are injected into the bloodstream and then hit with ultrasound. This makes the bubbles vibrate, revealing areas where new blood vessels are growing from existing ones, a sign that cancer may be spreading. They're also working on ways that pair ultrasound and micro-bubbles to deliver targeted chemotherapy to very specific places in the body. This will avoid exposing healthy cells to chemotherapy drugs. It also means that cancers that can't be reached with surgery will one day be treated more effectively.

Faster and better is the mantra of these cancer researchers.

## DREAM CATCHER

Here's something that doesn't happen only in the movies. Using deep brain stimulation, Sunnybrook scientists recently doubled the dreaming sleep of patients with severe Parkinson's disease. These patients were already undergoing another neurological procedure for their condition, making it possible to study this area of the brain at the same time.

Doctors used a device similar to a pacemaker – but for the brain. Using electrodes implanted into a 3mm area that's the source of P waves (the precursor to rapid eye movement) scientists were able to selectively increase the amount of dreaming time of the patients. Further research using this breakthrough technique could unlock the secrets to new treatments for depression, dementia and stroke.

## GET THE LEAD OUT, GIRLS!

A recent Sunnybrook study showed that physical activity in teenage girls has a direct bearing on their brain health later in life. "Youth who are active have better cognitive and academic performance. We think it is possible that early-life physical activity – similar to early-life education – could help to build 'cognitive reserve' that has long-lasting benefits," says Dr. Laura Middleton, principal investigator of the study. And it's never too late for the rest of us. Women who were inactive in adolescence but became physically active in later life had lower risk of cognitive impairment than those who remained inactive. So get your game on!

# one year, two missions

Healing the brain of the victim of a massive stroke was a tough enough challenge for doctors at Sunnybrook's Brain Sciences Program. Then they were called upon to heal her mind - and they had to dig deep to save her life one more time

By Celia Milne

Photography by Tim Fraser

Candace Allman is blessed. She stared death in the face twice in one year, and both times staff at Sunnybrook's Brain Sciences Program drew her back to safety.

"They saved my life, mentally and physically," says Candace, who survived first a major stroke and then a severe depression with psychosis, both of which threatened to end her life. "Two miracles in one year is what I call it."

Five years later, sitting comfortably in her cozy, spotless Toronto townhouse while husband Denis works one floor up, Candace describes her dramatic journey. It began in March 2005, when she was only 52.

Candace was sitting in the midtown office of the maternity lingerie firm where she worked as a collections manager. She was on the phone with a friend, setting a date to get together. In the first of several lucky breaks that year, the friend was an expert in auditory and verbal therapy. Though she didn't realize it, Candace was slurring her words. The friend suspected she was having a stroke. He hung up and called someone else in her office and asked them to check up on her and dial 911.

Candace's co-workers rushed into her office. "When they came in, I was slumped over on my left side," she recalls. Candace didn't know she was having a major stroke; she thought she had simply fainted. Next she remembers a lot of fuss and then some paramedics coming. The president of the lingerie company, a good friend, told Candace that Denis had been called and was on his way. "I was thinking, 'Why are they calling him? He'll just worry.'"

In retrospect, Candace thinks she could have been more proactive about her health. Her father had had a stroke at age 46. Before her own, she had been walking around with a condition known as atrial fibrillation (irregular heart beat), a risk factor for stroke, and she didn't know it. "I was feeling healthy. I stupidly hadn't gone to the doctor for five years. You procrastinate. You think, 'I feel fine.'"

Atrial fibrillation was probably responsible for Candace's blood clot - a clot that travelled to her brain. About 15% of strokes are due to atrial fibrillation.

Paramedics rushed Candace to Sunnybrook which, as one of

three regional stroke centres in Toronto, has a stroke team on call around the clock. But the hospital treats stroke beyond just the emergency phase; it also provides a range of clinical services that people like Candace might need after their stroke: prevention of another stroke, rehabilitation, and links to community services.

The Brain Sciences Program is unique because it's dedicated to working with disorders of both the brain and the mind. When the physical brain is damaged, it can affect one's ability to communicate and process information - disrupting everything from physical movements to mental capacity and emotions.

The program uniquely incorporates staff from neurology, psychiatry, neuroradiology, neurosurgery, neuropsychology, nursing, and the allied health professions. Its three cornerstones - stroke, dementia and mood disorders such as depression - are among the greatest public health challenges of an aging population.

Candace was to be in very good hands for her own life-threatening challenge.

## SAVING THE BRAIN

On the day of Candace's stroke, Dr. David Gladstone, director of the stroke prevention clinic and a stroke neurologist, was on call. He is one of the 10 neurologists who provide emergency stroke care around the clock at Sunnybrook. She arrived 29 minutes after her friend had called 911.

"The stroke team assessed her immediately as she was brought in to the Emergency Department," recalls Dr. Gladstone. "Every minute counts during an evolving acute stroke. We respond like we would to cardiac arrest."

Candace's second lucky break was that just days before her stroke, a Toronto-wide ambulance protocol had been established to get stroke patients to expert care as soon as possible. Under the new protocol, paramedics rush suspected stroke victims to a regional stroke centre rather than the local hospital, while a "code stroke" paging alert goes to members of the stroke team on call. The goal is to salvage as much brain function as quickly as possible.

It is estimated that for every minute of delay in treating a



stroke patient, nearly two million brain cells will die. "There is precious little time to save brain after an acute stroke," says Dr. Gladstone.

What makes the timing so important is that some stroke patients qualify for a clot-busting intravenous medication, tissue plasminogen activator (tPA), which can reverse some types of stroke if given during the first four-and-a-half hours. While tPA can be effective for some patients, average treatment rates across the country remain disappointingly low, at about 5%. Streamlining the code stroke ambulance system means more of the right patients get to regional stroke centres such as Sunnybrook, which provide this brain-saving treatment.

"She was lucky to be redirected here," says Dr. Gladstone. "If she had gone to a community hospital, she wouldn't have been able to receive treatment with tPA."

Dr. Gladstone remembers Candace coming in: She was on a stretcher, completely paralyzed and without feeling on the left side. She had lost half of her vision and her speech was slurred. The diagnosis was a major stroke affecting the right side of her brain. (The right side of the brain controls the left side of the body and vice versa.) "We knew she was in serious trouble," says Dr. Gladstone.

The Sunnybrook stroke team set to work imaging her brain and arteries using state-of-the-art brain scanning methods. "We were able to tell within minutes that she had blockage of one of the main arteries in the brain," says Dr. Gladstone. "It was an extensive blood clot. Brain blood flow was severely reduced, brain cells were in the process of dying, but there was an opportunity to rescue the brain if we could open the blockage and restore normal blood flow."

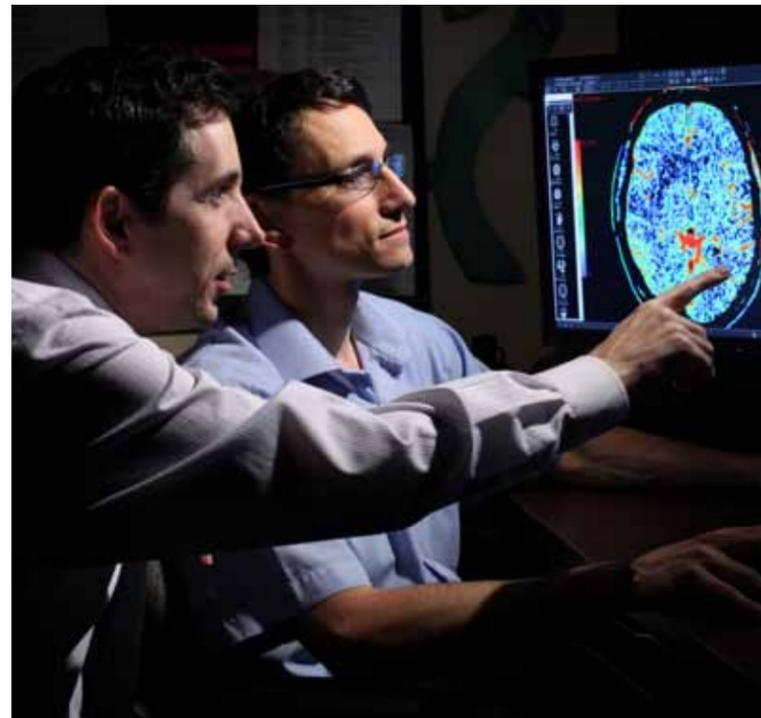
The stroke team went into high gear. They initiated an intravenous infusion of tPA. But first, they needed to describe the risks to Candace and her husband Denis, and get consent. "We estimated there could be a 10% risk of a very serious bleeding complication from the therapy. It's high stakes, high risk," says Dr. Gladstone. But not treating Candace aggressively could have meant permanent cognitive and physical disability and a prolonged hospital stay.

"She would have left the hospital in a wheelchair. There was a chance she wouldn't have survived," says Dr. Gladstone.

Candace remembers giving consent. "I said go ahead. I was 100% sure that it was going to work. I understood the procedure was going to be risky."

Interventional neuroradiologist Dr. Richard Aviv was called in to do some highly specialized work: He inserted a catheter into an artery in her groin and directed it up into her brain to provide even more tPA directly into the blocked artery, and he used the catheter to mechanically break up the clot. "It was all very risky, says Dr. Gladstone. "She was in the prime of her life. "We pulled out all the stops."

The procedure took about two hours: "It was very tense. We were praying it would work, but worried she might bleed from the treatment."



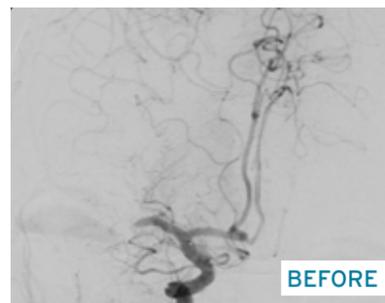
**ABOVE:** Dr. David Gladstone and Dr. Richard Aviv discuss scans of patient Candace Allman's brain. **BELOW:** Pre- and post-treatment angiograms of Candace's brain show the return of blood flow after the blockage in the main artery was cleared.

While on the table, Candace suffered an epileptic seizure: she was also in rapid atrial fibrillation that required treatment. "It was like an episode of ER; we were trying to manage multiple emergencies at once," says Dr. Gladstone. "This was real teamwork in action – neurology, radiology, emergency medicine, intensive care, and internal medicine teams all working together to save her."

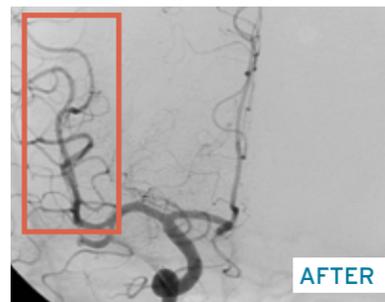
While Dr. Aviv conducted the precise manoeuvring inside her brain, pictures were being taken to monitor the results. Dr. Gladstone remembers the eureka moment. "Before treatment the vessel was blocked, and then suddenly we saw the blood flow return. It opened up. Immediately she was able to raise her paralyzed arm and move her leg again. This was the moment we knew the treatment was successful."

For Candace, it was all a bit of a blur. "By the time I realized I was paralyzed, I was already moving again," she says. "As soon as the blood clot burst, I could wiggle my toes and my eyes were working again. It totally reversed the stroke."

Candace made a complete neurological recovery. Within 24 hours, she was up and walking. "This was a rare miraculous cure from a stroke," says Dr. Gladstone. Candace walked out of hospital feeling perfectly normal. Because of her atrial fibrillation, she was prescribed the anti-clotting medication warfarin to reduce her risk of another stroke.



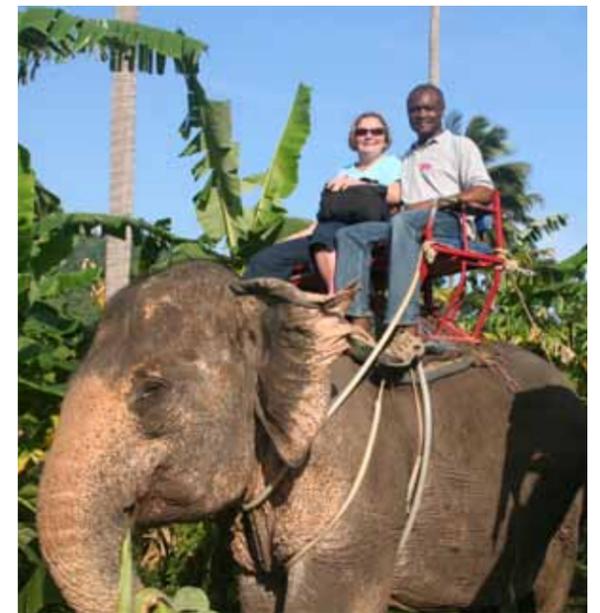
**BEFORE**



**AFTER**



Since her recovery from stroke and depression, Candace has found new life travelling the world with husband Denis on adventures including parasailing in Hawaii and riding elephants in Thailand.



**SAVING THE MIND**

Candace was soon back at work. But in June of that year, about three months after her stroke, trouble returned. Candace's thinking was becoming distorted. She thought she was going to be fired. She obsessed over what to eat and whether she was getting enough of the vitamins she needed. She was convinced she had diabetes. She withdrew from friends. "I had crazy ideas about eating. I couldn't sleep," she says.

She went for help and was prescribed anti-depressants, but they didn't work. Candace was developing severe depression. One day she told herself, "I don't want to live like this."

"That day," she recalls, "I felt like jumping off the top of the townhouse." Denis called Sunnybrook and Candace was admitted to the Brain Sciences Program's psychiatry department as an inpatient. Once there, her obsessions became more serious; in one incident she even felt that she might stab someone in the cafeteria with a fork.

Her diagnosis? Severe depression with psychosis. She would remain in the locked ward for eight weeks.

It is not widely known that post-stroke depression is very common, occurring in about one-third of stroke patients, and post-stroke dementia occurs in about another third. Candace's depression was somehow triggered by her acute stroke, and Sunnybrook's program is specially designed to address this connection.

For the first five weeks in hospital Candace received anti-depressants and anti-psychotic medications, but she did not improve. It would take another risky procedure to save her. Electroconvulsive therapy, which for decades has been known as "shock therapy," induces small seizures that often fix the brain circuitry when it's gone awry, but it was risky because she'd already had an injury to her brain. Doctors first tried unilateral ECT, in which the pads were only placed

on the left side of her head, leaving the already-traumatized right side alone. That didn't work.

With few options left, doctors asked Candace and Denis for consent to try the much riskier bilateral ECT, using pads over both sides of her brain. The couple gave consent – and again their trust was repaid. "After the third one, I was right back to my old self again. It was like a second miracle. I was back to being me." Candace is still under the care of Dr. Anthony Feinstein, director of the Sunnybrook neuropsychiatry program; she receives anti-depressants, and has not had another episode of depression.

She is eternally grateful to her team of doctors at the Sunnybrook Brain Sciences Program. "I can't thank them enough. I could be mentally and physically disabled – or not here at all."

For five years since, Candace has been living an inspiring life. She resigned from her collections job and dedicated her working hours to volunteering to help others with stroke and mental illness. As she sips a Perrier in the terra firma of her house, Candace is healthy and happy. "Everything's fine; I'm slightly weaker. I can't dance the polka the way I used to. If that's all I have after all this, that's pretty good."

She and Denis travel extensively and like adventurous vacations. Dr. Gladstone receives postcards from her travels to exotic locations, showing Candace hugging a koala bear, swimming with dolphins, riding a camel or tandem parasailing.

"She is an incredible survivor," says Dr. Gladstone. "And now she is living life to the fullest. It is an absolutely incredible transformation. She's an inspiration to us and to other patients."

Candace's amazing story is one of the things that motivates Sunnybrook's medical staff to keep doing what they do. "To be able to make a difference in someone's life in this way is a most gratifying experience," says Dr. Gladstone. 🍀

One person every 10 minutes is hit by a stroke in Canada. Stroke, the second leading cause of death globally, kills 14,000 Canadians each year.

Of every 100 stroke victims, 15% die, 75% are left with disability (10% so severely disabled that they require long-term care), while only 10% of stroke sufferers recover fully.



Wendy Wilson consults with cancer specialist Dr. Jean-François Boileau.

BREAST CANCER

## A new plan of attack

The first step for new breast-cancer patients is usually the operating table. But for many women, chemotherapy could be the place to start

Wendy Wilson was on a healthy living path – making better choices and hitting the gym regularly – when the 55-year-old information technology worker from Ajax, Ont., heard those life-altering words: breast cancer.

Soon after being told in May that the lump in her right breast wasn't just one of the many benign cysts she has had drained over the years, Wendy was meeting with Sunnybrook's Dr. Jean-François Boileau – and on her way to contributing to research that may one day turn breast-cancer treatment protocol on its head.

"From the time my doctor couldn't drain the cyst, to the time I went for an ultrasound and mammogram, and then saw the surgeon [Dr. Boileau], it was about two weeks. He did the biopsy right there and got me the result within a week," Wendy says from the Richmond Hill home of her 34-year-old daughter Melissa.

Dr. Boileau is Sunnybrook's principal investigator with the National Surgical Adjuvant Breast and Bowel Project (NSABP), an international, collaborative group behind many important studies, including two

current North American trials. The Odette Cancer Centre is the only Ontario site involved in the trials, which focus on tracking how women fare receiving chemotherapy before breast-cancer surgery.

The Montreal-trained surgeon explains the theory behind presurgical chemo this way: "Instead of removing the tumour first and then giving chemo and radiation and waiting to see if there is cancer recurrence, you give the chemo treatment first, and six months after you do the surgery, right up front you have your surrogate end point – when you finally remove the tumour after chemo, you are able to see if there are any cancer cells that remain."

Dr. Boileau, who joined the oncology team last September, has served as a lifeline of sorts for Wendy. Shortly after meeting Dr. Boileau, she became one of the 522 participants in one of the trials for women with operable breast cancer.

To Wendy, joining the trial was an easy decision: "It made sense so I thought, I'd like to try it. Why not shrink the tumour first and kill all the cancer cells before surgery, »

so there is less surgery and possibly other good things that can come out of it, like reducing the chance that the cancer might come back.”

Since starting her chemotherapy regimen June 18, Wendy has been splitting time with her daughter, who is expecting her third child in March, and her parents, who live in Scarborough. Having her family close has been important while she remains on medical leave from her IT job at Canadian Tire and copes with chemotherapy side-effects, like fatigue and losing her brown, shoulder-length hair. “When I found out I had breast cancer, I thought, ‘I have no choice but to go through these treatments, I just have to be strong and keep moving forward,’” she says.

But what about the long-held perception that treatment for a breast-cancer diagnosis automatically means surgery to remove the tumour (or possibly the breast) followed by cancer-cell killing chemo and radiation? Is chemo before surgery like putting the proverbial cart before the horse? It’s an important question, given that one in nine Canadian women is expected to develop breast

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What about the long-held perception that treatment for a breast-cancer diagnosis automatically means surgery followed by cancer-cell killing chemo and radiation?

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cancer during her lifetime, and one in 28 is expected to die from the disease, according to the Canadian Cancer Society. Although the incidence of breast cancer has stabilized in the past decade, 23,200 women and 180 men will be diagnosed with breast cancer this year, the society projects.

Dr. Boileau notes that NSABP researchers first began using chemotherapy before surgery more than 50 years ago (albeit for different reasons), when young women in a randomized study were given a dose of chemo right before surgery and two doses afterwards. “It was the first time we discovered that giving agents actually improved survival

and changed the natural history of cancer.”

Since then, there have been various clinical trials involving presurgical chemotherapy, initially meant for patients with locally advanced or borderline inoperable breast cancer, but increasingly given to those with less advanced or operable breast cancer.

Besides better targeting cancer cells, lowering the risk of recurrence and increasing survival, giving chemotherapy before surgery has been shown to reduce tumour size, usually meaning more of the breast can be saved during surgery, and has strong potential to help various subgroups of breast-cancer patients, such as those who are classed as “triple-negative” (a common form of aggressive breast cancer which does not respond to hormone-based treatments like tamoxifen or Herceptin).

“These types of breast cancer will respond very well to neoadjuvant chemo,” says Dr. Boileau. “Although they are aggressive cancers that are classically linked with a less favourable prognosis, when we treat them with chemo before surgery, there is a much higher rate of survival. With the current clinical trials, what we’re trying to do is improve on the treatments to achieve higher rates of complete pathological response because we know survival rates end up being higher.”

A key philosophy at the Odette Cancer Centre is collaboration between specialists; in cases such as this, for example, Dr. Boileau, a surgical oncologist, works closely with Dr. Rebecca Dent, head of the Locally Advanced Breast Cancer Clinic. Dr. Dent says such a multidisciplinary approach leads to better-tailored treatment, resulting in less toxicity to the patient.

Wendy, for one, is preparing for surgery likely around the end of this year with her eye on the prize – a breast cancer-free future for herself and others.

“Sometimes I think, ‘My God, my life is completely upside-down. I don’t go to work, I’m not doing the things I usually do.’ But I can either lie in bed and be depressed, or say, ‘I still have things I need to do.’ Now I’m starting to go out with my friends and I love being around my grandchildren. There’s no way I’m giving in to cancer.” 📧

## NEW UNIT TO PROMOTE EARLY DIAGNOSIS

The ongoing clinical trials of presurgical chemotherapy are not the only exciting advance in fighting breast cancer.

Rapid diagnosis is also key to beating the disease and giving patients reassurance that the sooner they know what’s going on in their body, the quicker they can move forward. With that in mind, Odette Cancer Centre is taking a leading role in moving women quickly from their family doctor - where suspicious lumps and other danger signs are commonly first addressed - to assessment and diagnostics experts.

The Centre will open its new rapid diagnostic breast-cancer assessment unit with expanded resources in January 2011, says Dr. Eileen Rakovitch, head of the Breast Cancer Care team.

Generally, the average wait time for assessment and diagnosis following a mammogram that reveals a problem, such a nodule or calcification, is four to six weeks - “and we think that’s too long,” says Dr. Rakovitch.

But Sunnybrook’s rapid assessment unit “will streamline referrals and allow women who have a suspicious finding ... to be referred to the unit, which will be led by an advanced practice nurse with special skills and training and education,” she says. The aim is to achieve an average turnaround time of one week.

The unit, which should be able to cater to 200 cases a month, will initially operate on the medical imaging level on the Bayview campus, but will eventually be housed in the new \$27-million Breast Cancer Centre, which will help thousands of patients with breast cancer as well as those at risk of developing the disease. Fundraising is continuing for the new 20,000-square-foot facility, which will be completed in about two years.



## MEDICAL MOVIES... ON DEMAND

Uninspired by the photos traditionally published in medical journals, Dr. Shelly Dev, critical care physician, had a better idea: create 'how-to' videos of commonly performed medical procedures, such as inserting IVs and breathing tubes.

She pitched her multimedia vision to the editors of the highly respected New England Journal of Medicine three years ago, and they've never looked back. Now, the Journal and Dr. Dev's videos have become a whole new virtual world of learning for hundreds of thousands of medical students and practitioners, all at the click of a mouse.



## responding to H1N1

When the threat of the influenza A (H1N1) pandemic gripped the community last year,

Dr. Andrew Simor, chief of Microbiology and Infectious Diseases, together with Dr. Henry Wong and Lisa Louie, had to respond quickly to increase the hospital's ability to detect the virus.

The team increased diagnostic capacity by testing for influenza A and B simultaneously in a single test using newer methods. This combined test doubled capacity and provided results in a matter of hours rather than days. They also used late-breaking genetic information on the H1N1 virus to enhance the U.S. Centers for Disease Control and Prevention's H1 subtyping test, making it able to detect much lower concentrations of the virus in patients' specimens.

These efforts led to quick and more accurate results to support patient care in the event of increased infection. "To minimize the impact of infectious diseases on the health care system," says Dr. Simor, "we continue to provide accurate and rapid diagnosis and to lead in infection surveillance."

## targeted treatments for liver cancer

Patients are benefiting from the Odette Cancer Centre's innovative surgical and radiotherapy treatments. Lyn Burnett, who needed laparoscopic surgery to remove cancer on the liver, had previously had an ileostomy to treat rectal cancer and was worried about this latest procedure. "It wasn't super easy but Dr. Calvin Law worked skillfully around the ileostomy," he says. "I spent three days in the hospital. I was up and walking four kilometres after a week and a half."

Dr. Hans Chung and his team provide another specialized treatment: stereotactic body radiotherapy for less-operable lesions. The high-precision radiation is guided by 3-D imaging to target it on the tumour and spare healthy tissue. "Treatment didn't stop me from my everyday living. The side effects weren't terrible, and Dr. Chung and the team were very good and meticulous," says patient Barbara Jacques.



## E-health boon for patients

Sunnybrook patients can now access their personal health information anywhere, anytime via a new web-based service in partnership with TELUS.

Building on the success of Sunnybrook's MyChart application, which provides the hospital's patients with secure access to their electronic health record through a secure section of the website, this new venture provides the same technology through the TELUS Health Space website. Sunnybrook first launched MyChart in

March 2006 as one of Canada's only online, secure web portals for patients to access their personal health information and share it with their family doctor, pharmacist or any professional they choose. Since then, the technology has been adopted by a number of different health care institutions and government agencies.

## search and destroy

Imagine having a tumour lodged so deep in your brain that surgery and radiation are too risky. Now imagine the relief on being told there was a way of getting rid of it without cutting into your skull.

Dr. Kullervo Hynynen, director of Imaging at Sunnybrook Research Institute, is working to make this a reality, not only for patients with brain tumours but with breast cancer and uterine fibroids. He has pioneered a method of using directed ultrasound to precisely pinpoint growths and destroy them.



Dr. Hynynen, who came to Sunnybrook from Harvard Medical School, has developed a process that uses ultrasound as a kind of "thermal scalpel" and magnetic resonance imaging technologies to guide the ultrasound energy to the unhealthy tissue. The idea is that several separate ultrasound beams that don't on their own damage tissue come to a single focus, producing enough heat to destroy tumours.

Dr. Hynynen's lab invented a helmet that fits over the head and has an array of devices that can produce ultrasound beams. Since each skull has a different shape and thickness, it takes precise mathematical calculations to focus the separate beams for each patient so that they pass through bone and converge on the growth.

A physicist who became interested in medical physics at Finland's University of Kuopio, Dr. Hynynen says it was an area where he thought he could be of most benefit others.

## HOLLAND CENTRE HONoured FOR NEW PATIENT-CARE MODEL

A more efficient system for treating patients with hip and knee arthritis has won Holland Orthopaedic & Arthritic Centre the prestigious 3M Health Care Quality Team Award.

The goal of the new model has been to improve access and quality of care for patients with these chronic conditions. Patients report high rates of satisfaction with the comprehensive assessments, enhanced education and improved coordination and delivery of services. The model of care, introduced in response to the Ontario Wait Time Strategy, uses a centralized referral intake and an electronic tracking system to monitor wait times and the status of referrals throughout the program.

## promise in new brain-cancer chemo

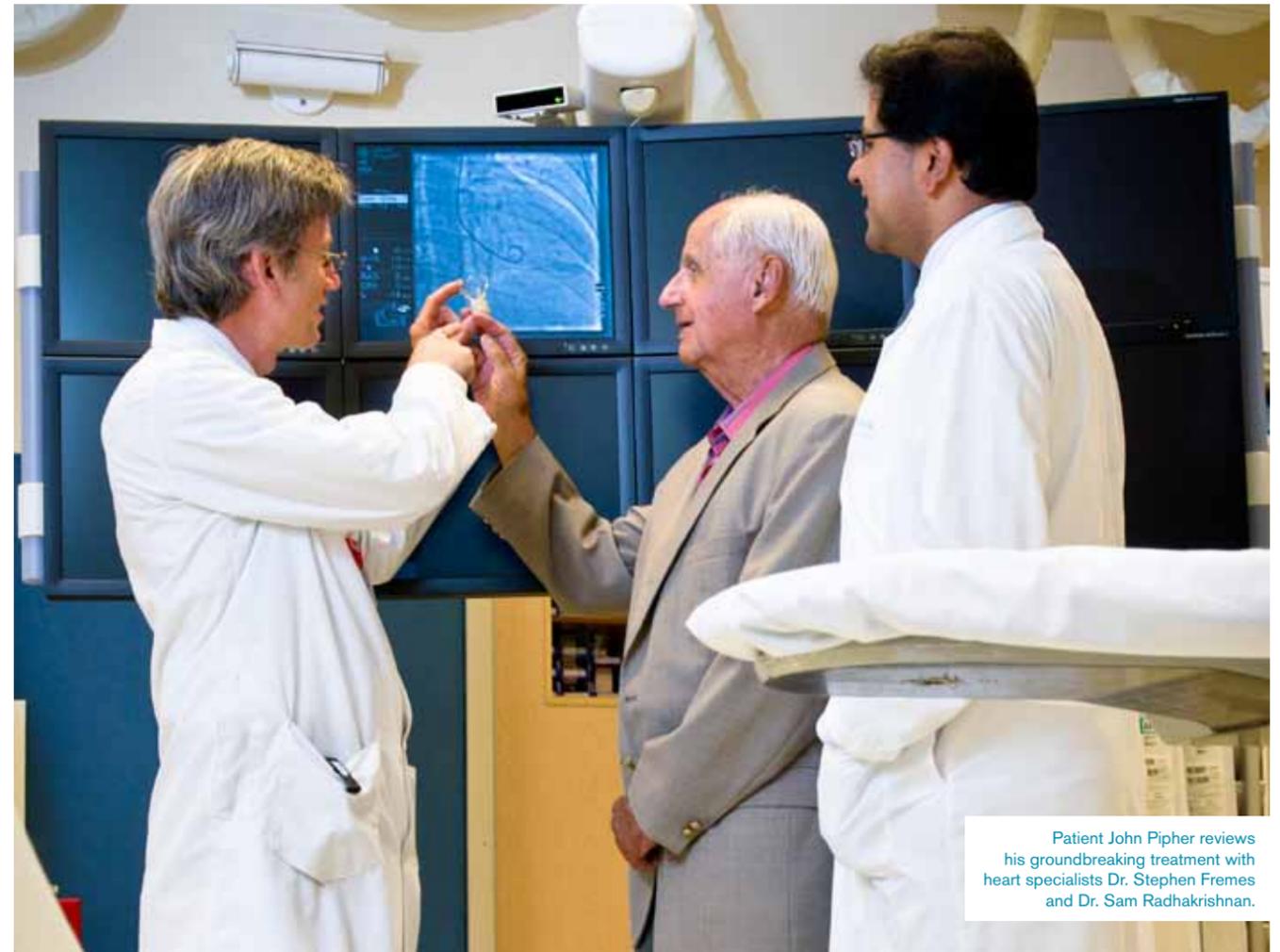
More than 2,000 Canadians are diagnosed with brain cancer each year. The most common and aggressive type, glioblastoma, is notoriously difficult to control with traditional chemotherapy. But a recent study pioneered by Sunnybrook's Dr. James Perry shows promise. By taking a low daily dose of a chemotherapy medication called temozolomide (TMZ) orally, patients experienced better control of their condition, with milder side-effects.

Daily use of TMZ has been shown to damage cancer DNA, blocking cells' ability to divide and reproduce. The medication can also overcome a particular cancer-cell protein that creates resistance to traditional chemotherapy – a huge benefit for patients. TMZ may also play a key role in the prevention of blood vessel growths that form around tumours and supply them with nourishment. Although not yet a cure for the disease, it's a step in the right direction.

## GETTING BACK INTO RHYTHM

Schulich Heart Centre has opened Toronto's first robotic arrhythmia invasive suite, where patients with irregular heartbeats can receive a state-of-the-art, minimally-invasive treatment to restore normal cardiac function.

The lab uses computerized, magnet-guided technology to enhance precision and safety, targeting the precise area in the heart where the malfunction is occurring, and treating the damaged tissue to restore a regular heart rhythm. Patients treated in the new lab are exposed to much less radiation than those who receive treatment in a traditional arrhythmia invasive lab. It is one of only three such suites in Canada.



Patient John Pipher reviews his groundbreaking treatment with heart specialists Dr. Stephen Femes and Dr. Sam Radhakrishnan.

THE TAVI TECHNIQUE

## Straight to the heart

Schulich Heart Centre is leading the way with a new procedure that is saving the lives of patients for whom open-heart surgery is not an option

One spring day two years ago, John Pipher was accompanying his wife, Grace, to her doctor's appointment in Toronto, when he suddenly felt something was going terribly wrong. A retired school principal, who was active and reasonably fit for his then-87 years, Mr. Pipher did not exactly collapse, but came close.

Within minutes, he was rushed by ambulance to Sunnybrook's Schulich Heart Centre, where he was diagnosed as having a massive heart attack and underwent successful emergency angioplasty. Unfortunately for Mr. Pipher, the doctors had also found a severe stenosis (narrowing) of his aortic valve and he was told that he would require open-heart surgery to replace the damaged valve.

"This was quite a shock. The only health problem I had until then was that I used to get a little out-of-breath, when playing tennis doubles," recalls Mr. Pipher, who divides his time between Toronto, Feversham, Ont., and a condo in

Florida. "Nonetheless, there was heart damage: the aortic valve was damaged." But unable to face the prospect of an open-heart operation and the ensuing long recovery period, Mr. Pipher decided not to submit to the surgery. "I hoped for the best."

While he changed his diet, exercised and took some medications, 17 months later Mr. Pipher was told by his cardiologist that because of the stenotic aortic valve his heart had deteriorated even more. "If we didn't do something, they'd pretty well wash their hands [of me]. I was devastated, because I thought I had to have open-heart surgery," he says.

But the doctor had some good news: Schulich Heart Centre had just introduced a new minimally invasive valve procedure, known as Transcatheter Aortic Valve Implantation, or TAVI, and Mr. Pipher was a good candidate. "I asked, 'How many have they done?'"

"He said 'two.' I said, 'I'll take it!'"  
On Dec. 7 last year, Mr. Pipher

**DID YOU KNOW?**  
Schulich Heart Centre cares for approximately 6,500 in-patients and 236,000 out-patients every year

was among the first patients at Sunnybrook to undergo the 2.5-hour minimally invasive valve procedure. A team of specialists, including an interventional cardiologist, cardiac surgeon and vascular surgeon, inserted a catheter into a blood vessel in Mr. Pipher's groin area. Using X-ray images of the inside of his chest, they were able to implant a new

open-heart surgery, but at very high risk, and provide them with a very good outcome at a much lower-risk profile."

Although a number of patients in Europe have undergone the procedure, Schulich Heart Centre is one of only a handful of centres in Canada that are currently performing TAVI. To date, the team has performed the



**Dr. Sam Radhakrishnan**  
Schulich Heart Centre

TAVI is truly a transformative therapy in the management of heart disease.

valve without the need for an open-heart operation. It provided further evidence that TAVI, a new life-saving technique, could help critically-ill patients suffering from aortic valve stenosis.

Aortic stenosis is a fairly common condition in today's aging population. It occurs when the aortic valve, which keeps oxygen-rich blood flowing from the heart into the largest artery of the body, becomes partially blocked, impeding the flow of blood into the rest of the body. If left untreated, aortic stenosis can cause the heart muscle to thicken and weaken, ultimately leading to heart failure, and death.

"Open-heart surgical replacement of the diseased valve with an artificial one is considered the best treatment for symptomatic aortic stenosis," says Dr. Sam Radhakrishnan, Interventional Cardiologist and physician-lead of the TAVI program at Schulich Heart Centre. "Unfortunately, many of the patients we see with this condition have significant co-existing medical conditions that render them unable or poorly capable to withstand the physical trauma of open-heart surgery. In the past, we have had to treat these patients with drugs alone, which has proven to be less effective than with valve replacement."

For some of these patients, says Dr. Radhakrishnan, "TAVI is truly a transformative therapy in the management of their heart disease. First, we can offer patients an option, who in the past may not have been candidates for life-saving therapies. Second, we can also consider performing this procedure on patients who may have been offered

TAVI procedure on 25 patients with very encouraging results. Patients undergoing a TAVI also experience reduced discomfort and need for pain medications, smaller scars, a shorter stay in hospital and a faster recovery than those who have open-heart procedures.

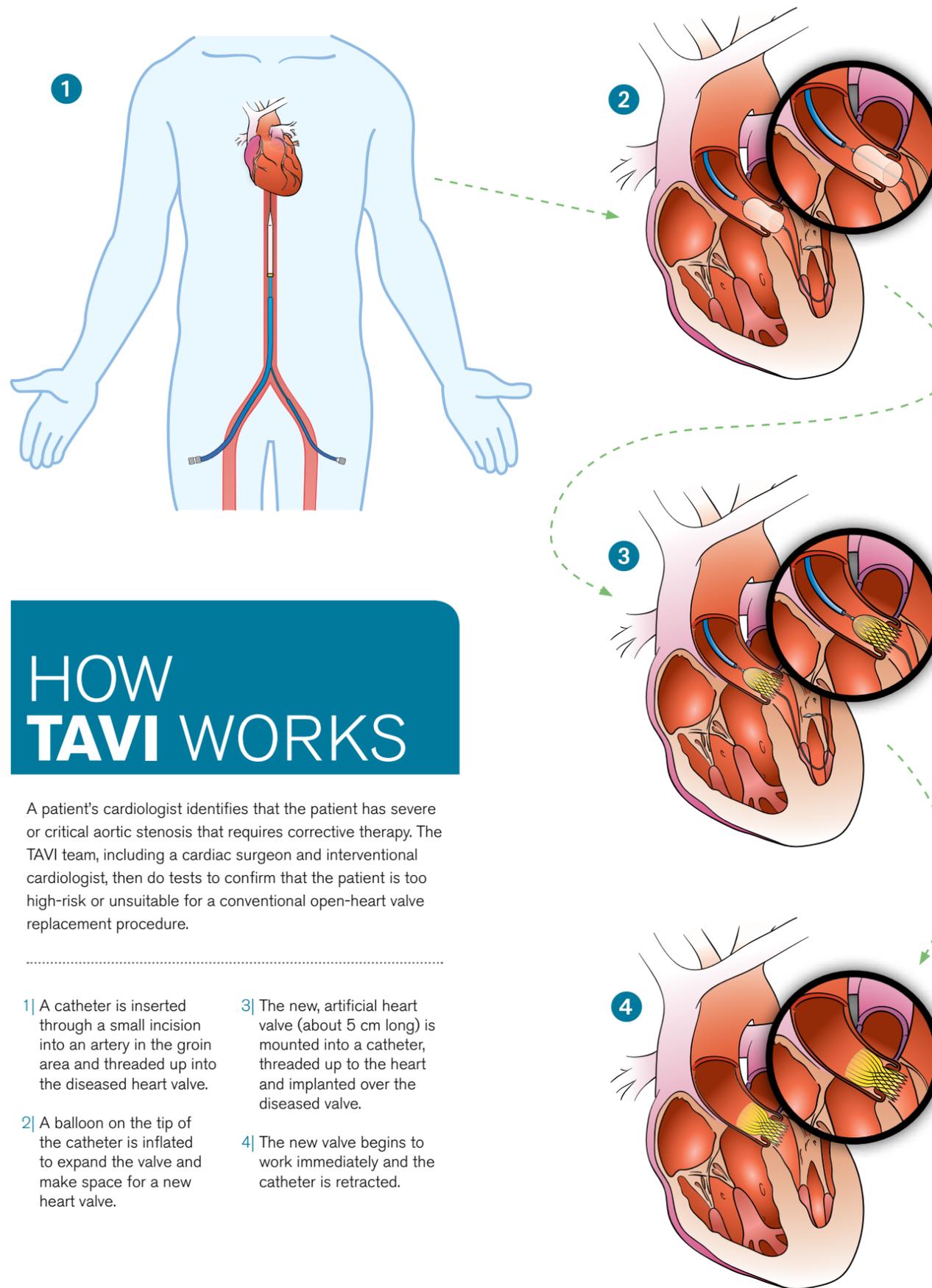
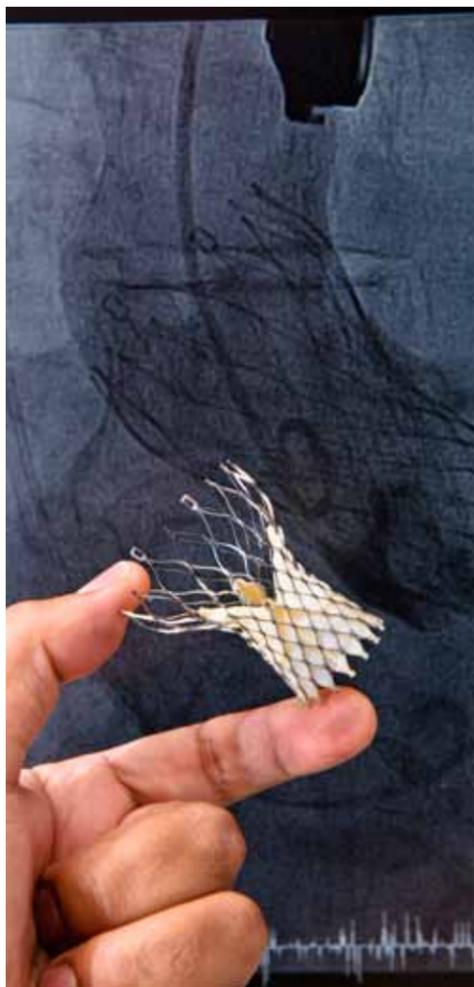
Many more patients could benefit from the TAVI procedure. "At present, for a variety of reasons, about one-third of patients with severe, symptomatic aortic stenosis do not undergo traditional open-heart valve corrective surgery," says Dr. Radhakrishnan. "As the population ages, this absolute number is certain to increase."

Each valve used in the procedure costs about \$30,000, which is not funded by the government. The cost is being borne by Sunnybrook Foundation donors. Dr. Radhakrishnan anticipates that this therapy will receive government funding in the future. "But we have decided to lead on this front as we believe it is important to be able to deliver this therapy right now for some of our most critically ill patients."

As for Mr. Pipher, who turned 90 in July, he is very grateful for the TAVI procedure, which was far less traumatic than open-heart surgery, and meant he could go home five days after surgery. He's also proud of his renewed vigour and energy.

"I do pretty much what I want, except for playing tennis, though," says Mr. Pipher, who gets exercise by walking. "I'm living one day at a time. I'm not owed anything. But I'm good for another 10 years." 📧

The artificial heart valve implanted as part of the TAVI procedure.



## HOW TAVI WORKS

A patient's cardiologist identifies that the patient has severe or critical aortic stenosis that requires corrective therapy. The TAVI team, including a cardiac surgeon and interventional cardiologist, then do tests to confirm that the patient is too high-risk or unsuitable for a conventional open-heart valve replacement procedure.

- 1| A catheter is inserted through a small incision into an artery in the groin area and threaded up into the diseased heart valve.
- 2| A balloon on the tip of the catheter is inflated to expand the valve and make space for a new heart valve.
- 3| The new, artificial heart valve (about 5 cm long) is mounted into a catheter, threaded up to the heart and implanted over the diseased valve.
- 4| The new valve begins to work immediately and the catheter is retracted.



## TRAUMA

# The lifesavers

Sunnybrook's reputation as a centre of excellence in trauma means it attracts some of the world's top specialists

Day in, day out, Dr. Homer Tien deals with the sickest people in Ontario: men, women and children whose bodies have been mangled by auto collisions, burned on up to 40% of their bodies, or suffering massive infections and whose organs and systems are starting to shut down.

In short, people who are within hours or even minutes of death.

But if these patients are admitted to Sunnybrook's Tory Regional Trauma Centre while their hearts still beat, the chances are heavily tipped towards survival and recovery.

"I have to say that about 50% of our patients die before they get to us," says Dr. Tien, the centre's medical director. "But once we have them, the mortality rate drops to just 11% to 13%."

Dr. Gordon Rubenfeld, chief of Sunnybrook's Trauma, Emergency and Critical Care program (TECC) says, "Our program is unique in Canada. We are transitioning from the traditional approach to treatment – where each unit is separate

and stand-alone – into a cohesive, completely integrated centre for emergency, trauma, critical care and burn patients.

"That extends entirely through the chain – right from the emergency responders who are first on the scene, through the local clinics and hospitals that stabilize patients, through the pre-hospitalization process to the helicopter and aircraft teams who bring patients to us from across the province."

The scope of what Dr. Rubenfeld and his team are doing and the success they are enjoying has meant that Sunnybrook has developed an international reputation – one that has allowed it to attract the best and brightest staff from around the world.

Dr. Tien, for example, is a military trauma surgeon, a lieutenant colonel with tours of duty patching up badly-injured soldiers in Kandahar. Dr. Marc Jeschke, medical director of Ross Tilley Burn Centre, is German-trained and came to Sunnybrook

from the Galveston Shriners Hospital in Texas where he was a burn specialist, reconstructive surgeon and researcher. He brought with him \$2 million in research grants from the U.S. National Institutes of Health and another \$1 million in capital grants.

Dr. Brian Cuthbertson, chief of the department of critical care medicine, joined the team from Aberdeen, Scotland, where he was a professor and consultant; and Dr. Rubenfeld left a post at the University of Washington three years ago to launch the program.

"It was a chance to put into practice an approach to medicine that we knew would save lives and improve outcomes for patients," Dr. Rubenfeld says. "The idea is not new but the formal program we now have in place is."

This approach is also reflected in the leading-edge treatments that the TECC doctors continually devise.

hospital – and indeed the province.

The Ross Tilley Burn Centre, for example, deals with patients from the age of 12 who have severe burns to their face, hands or genitals or those that have burns to 10% or more of their bodies. Its 14 beds accommodate between 200 and 240 patients a year, says Dr. Jeschke.

"The great strength of Sunnybrook is that it encourages not just the very best in patient treatment and care, but research as well," he says. It was that ability to combine work as a clinician with research at the Sunnybrook Research Institute that was a main motivator behind his decision to join the trauma centre team in May, Dr. Jeschke adds.

Research shows that severe burns demand more than immediate treatment and reconstructive surgery.

They not only have long lasting emotional and psychological effects but also have been shown to affect the

much aware. The largest percentage of my time is probably spent talking with them, explaining what is going on and understanding what they are going through."

Dr. Tien puts it a different way. "Our cases in the trauma centre are both technically difficult and emotionally difficult," he says. "There is a huge difference between what we do in the trauma centre and what is done in emergency. If you break an arm, you go to emergency; if you get hit by a bus, you come here."

And it is just those challenges – repairing savagely injured bodies, saving lives from certain death from heart attacks, stroke, or pandemics such as SARS, that draws the best physicians and researchers to Sunnybrook, says Dr. Rubenfeld.

"The process of improving treatments, patient care and support for families is never ending," Dr. Rubenfeld says. "It is something we all believe in, something we all share that commitment to get better and better at what we do." 📌



Dr. Gordon Rubenfeld  
TECC

The process of improving treatments, patient care and support for families is never ending. It is something we all believe in.

"Sometimes the innovations we introduce may seem small to the layman but in medical terms they are significant leaps forward," Dr. Rubenfeld says. "One is the need to keep the brain cool in heart attack patients to prevent damage to that essential organ. Sunnybrook's team now administers chilled intravenous fluids and packs the patient's armpits with ice bags. We are now looking at how to prevent secondary injury to the brain in patients with head trauma."

Dr. Rubenfeld readily admits his program had an extraordinarily strong base to build on. The Tory Regional Trauma Centre was the first in Canada when it opened in June, 1976. Since then it has treated more than 20,000 trauma patients and now has about a 90% survival rate.

In 2009 the trauma unit's 27 beds handled 1,100 patients, who arrived by land and air ambulance from more than 80 referring hospitals across the province. The Emergency Department alone sees 42,000 patients a year. What ties the centre's patients together is that they are some of the most critically-ill people in the

body's metabolic system for between three to five years after the original incident and can alter genomes for up to two years.

The burn centre is also part of Dr. Cuthbertson's department of critical care medicine. Critical care has 52 beds and a staff of 16 full and part-time physicians and 350 support staff – mainly nurses. Each nurse is assigned one patient and each patient needs five nurses to provide care around the clock. The average stay is four days, although some may remain for months; the cost is about \$2,500 a day to the hospital.

"We are almost always full up," says Dr. Cuthbertson. "We take two-thirds of the cases from Toronto – the very, very sick. Unfortunately not all of our patients will survive but the numbers who do are astonishing, considering how sick they were when they came to us."

In Dr. Cuthbertson's mind, what he and his team members at the trauma centre do is not just high-tech, but "high-touch" medicine. "Our patients are largely unconscious and unaware of what is happening to them," he says. "But their families are very

Dr. Homer Tien, pictured talking to a Sunnybrook patient, is a military surgeon with tours of duty in Afghanistan.





# small wonders

Sunnybrook's tiniest patients – and the staff who guide them (and their parents) through their first few delicate weeks of life

By Marjo Johne  
Photography by Ryan Enn Hughes

Born almost four months too soon, Hughie Thornhill was too tiny even for the “preemie” garments – clothes made especially for premature babies – that his mother, Amalia Muto, had received as gifts from friends and family.

“He was tiny – just 780 grams (1.7 lbs) when he was born,” recalls Amalia, whose 24-and-a-half-week pregnancy was marked by frequent bleeding and extreme fatigue. “He was actually smaller than my hand.”

But finding the right-sized clothing for her newborn was the least of Amalia's worries. Hughie had a long list of serious health problems that included a brain bleed, meningitis, damaged lung tissue, pneumonia and a potentially blinding eye disease called retinopathy of prematurity.

Doctors gave him a 50% chance of survival.

“In the beginning, he wasn't breathing at a 100 per cent so he had to be given oxygen or his skin would go blue,” recalls Amalia, who gave birth at Sunnybrook's Women & Babies Program, which until last month was located at Women's College Hospital. “I was really scared that I would lose my child.”

It's emotionally draining enough being the mother of one critically-premature child – so imagine what Sandra Thompson has been going through these past months. The mom of two beautiful but tiny twin girls didn't get to hold one of them, Samantha, until two-and-a-half weeks after birth, and the other, Hailey, after five long weeks.

“Holding them for the first time, it's hard to put into words: It was amazing and scary. They're so tiny, you're very nervous about being able to hold them without hurting them,” says Sandra. “The nurses tell me they remember your heartbeat ... it was very heartwarming and reassuring that they still remembered their mother.”

 As part of the Aubrey & Marla Dan Program for High Risk Mothers & Babies, the neonatal intensive care unit (NICU) provides critical care for infants who are extremely pre-

mature or seriously ill, as well as continuing care for infants with moderate risk complications. Of the 4,000 babies born each year at Sunnybrook, about 1,200 spend time in the NICU.

Close to 200 full and part-time health care providers work at the NICU, including neonatologists, respiratory therapists, nurses and nurse practitioners, dietitians and pharmacy technicians. Each team member is trained specifically to care for preemies.

“That's important because pre-term babies require special care,” says Marion Deland, patient care manager at the NICU. “For example, babies who are born at less than 34 weeks can't stay warm and they can't co-ordinate their suck, swallow and breathe functions, so you need to know how to feed them.”

But it isn't just the babies who need special care, says Ms. Deland. “An important part of what we do here is provide support to the families,” she says. “In fact, for us, the patient is the family.”

Sandra Thompson's twins were identical, which is a warning sign for complications because of the shared placenta. At her 27th week of pregnancy, things became critical. The smaller twin, Hailey, started losing nutrients because of reverse flow in the umbilical cord. They had to come out right away.

“I was not prepared,” said Sandra. “My husband was at work ... and made it to the hospital just in the nick of time while doctors were just starting the caesarean.”

Hailey weighed 1lb, 13oz. and Samantha was 2lb, 8 oz. Both had to be given a breathing tube right away. Samantha was able to progress from that in a couple of weeks to a continuous positive airway pressure (CPAP) machine, with a mask over her face, and to a low-flow oxygen system, with tubes coming out of her nose, after another three weeks.

Hailey's first few weeks were more difficult. She developed an infection and was diagnosed with two serious heart defects, but eventually the problems improved without the need for surgery. She continues to grow and thrive.

“Everyone says that being a parent of premature infants in the



**ABOVE:** Here, tiny Hailey is held for the first time since her premature birth by her mother Sandra Thompson. **BELOW:** Dr Paige Church of the Neonatal Follow-Up Clinic gives a check-up to one of her veteran patients.



NICU is a rollercoaster ride," says Sandra. "You're so happy at first that they're doing well and seem to be coming along, and all those initial fears you had when you were giving birth, you've been reassured that they're going to get better and stronger and bigger and do fine.

"And then you hit one of these bumps in the road," she says, her voice breaking, "and you just crash again. You're devastated by the news and you're trying to keep yourself together and learn about the problem and make an informed decision about the care that's being recommended.

"I don't think I could have gone through this without the support of the nurses and doctors really taking the time to sit down and explain the medical issues that arise and making sure you understand the issues. They are an exceptional group."

Samantha came out of the NICU at 33 weeks (six weeks after birth). Ultrasounds showed a few cysts in her brain, which, while not significant, are located in the visual and motor areas, so she may need extra help later with things like strengthening her legs. Her next big step is learning how to breast feed.

At the time of going to press, Sandra and her husband, Steve Howes, were hoping Samantha would be allowed to go home within a couple of weeks. Hailey has some ways to go before she will be ready to join her sister.

"They're getting there ... slowly, but they're getting there," Samantha said.

 To meet the special needs of pre-term babies and their families, Sunnybrook follows a unique model of care that includes six years of follow-up. The standard in the field is two years.

Dr. Paige Church, a clinical director of the Neonatal Follow-Up Clinic, says it's important to monitor the childhood development of pre-term babies because many develop physical, behavioural and learning disabilities, some of which can be averted with the right care.

The follow-up clinic arranges for services such as physiotherapy and speech therapy and works with schools to ensure teachers understand the learning challenges faced by many of these children. Sometimes, says Dr. Church, a child who was born pre-term may be behind fellow classmates. Making sure teachers know this prevents the child from being labelled as learning impaired.

Dr. Church and her team also work with the families to identify and correct certain behaviour common in pre-term kids – such as extreme shyness or a too-strong attachment to a parent, in most cases the mother.

Dr. Church, who came to Sunnybrook two years ago from Boston, has completed a combined fellowship in neonatal-perinatal medicine and developmental pediatrics - one of only two pediatricians in North America with this mix of sub-specialty training.

"A developmental behavioural pediatrician is trained to take care of kids as they develop," explains Dr. Church. "Having this knowledge

combined with training in neonatology allows us to assess children more thoroughly and diagnose for things like learning disabilities, hearing impairment and cerebral palsy."

Leading-edge technology has also allowed Sunnybrook to continue raising the bar in neonatal intensive care. The NICU was the first in the world to create an advanced milk-management system, called LacTrack SafeLx, that uses barcodes, wireless scanners and a sophisticated tracking system to ensure the right breast milk is given to the right baby.

With an average of 30 babies at any time in the NICU, each feeding 10 times daily, there was a chance – albeit a very small one – that a baby might be given milk from another mother.

So far, Sunnybrook's unique model for neonatal intensive care has yielded impressive results. Survival rates are among the best in North America. Less than five per cent develop cerebral palsy – significantly lower than the average of 12 per cent to 15 per cent.

"I think this place is magic and I think we get the results that we do because every person in NICU is passionate about always doing what's right for the child," says Dr. Church.

Over the years, many former NICU patients have come back to Sunnybrook to see where their lives began and meet some of the NICU staff who once took care of them. Ms. Deland, who has worked in the NICU for close to 30 years, says



**DID YOU KNOW?**  
80% of mothers delivering at Sunnybrook are now over the age of 30

Hughie Thornhill, who at birth had only a 50% chance of survival, is now a healthy toddler following the care he received at Sunnybrook's NICU.

tears and awe often mark these visits.

"Some babies, you see them 25 years later and you're just flabbergasted that they've done so well – so happy and healthy and well adjusted," she says. "I'm always amazed that the short period of time we spend with these babies and their families could have such a significant, lifelong impact."

 Hughie, now a normal, healthy toddler, loves zooming around his backyard on his trike. His mother, Amalia, believes her son is alive today because of Sunnybrook's expertise in caring for premature infants.

When it looked like Hughie might die because of his badly damaged lung tissue, one of the NICU doctors prescribed small doses of dexamethasone, a powerful anti-inflammatory steroid. "He got better almost within a week," says Ms. Muto. "Everyone was cheering."

On another occasion, a nurse's well-trained eye noted that Hughie was sucking in one side of his stomach every time he inhaled.

"She knew right away that something was wrong, so they did an X-ray and found that one lung had collapsed," says Ms. Muto. "It was just amazing how the doctors and nurses in NICU seemed to catch problems so quickly and treat them right away. If they even had the slightest suspicion that something might be wrong, they'd order tests right away just to be sure."

The NICU team helped in other ways. One staffer offered to help her complete the paperwork for her maternity leave application. And later, when Amalia moved to Durham region from Toronto, Sunnybrook took care of finding speech and physical therapists for Hughie closer to their new home.

"Everyone was so sympathetic, so nice and I felt like they really understood what I was going through," she recalls. "When I cried, the nurses would come and rub my back. They felt like family, they gave me hope." ■



Ontario government minister Kathleen Wynne, who represents the Don Valley West riding in which Sunnybrook is located, toured the new facility just prior to its opening.

# HOME, SUITE HOME

## CANADA'S MOST ADVANCED MATERNITY WARD OPENS

Sunnybrook's littlest patients have a new home away from home, and it's Canada's premier facility for birthing and caring for critically-ill newborns.

Last month, Sunnybrook opened the doors of its new Women & Babies Program centre, a \$160-million, 120,000-square foot facility occupying two recently-added floors at the hospital's Bayview campus. The facility is part of a \$188-million capital expansion at Sunnybrook, with the Ontario government funding 77% of the cost and Sunnybrook donors funding the remainder.

Until the centre's launch on September 12, the Women & Babies Program, which includes the Neonatal Intensive Care Unit (NICU), operated out of cramped quarters at Women's College Hospital. "Our previous location was a bit outdated and we really needed more space," says Dr. Paige Church, clinical director of the Neonatal Follow-Up Clinic.

It took 18 months of planning, 160 people and 27 specially-equipped medical vehicles to execute the five-day move between the old location and the new centre, but it was well worth it.

Dressed in soothing earth tones of blue, green and burgundy, the new centre houses 48 beds for NICU patients. Each baby will have its own private room, each one connected to a family suite where parents can stay the night. The new, expanded space means the NICU will be able to care for more of the 1,200 pre-term babies delivered each year at Sunnybrook.

Lounge areas with televisions, fireplaces, Internet access and bulletin boards provide comfortable spaces for visiting family members. A neonatal pharmacy and breastfeeding clinic – where breast milk from new moms and donors is stored and prepared for feeding to NICU patients – ensure the babies have everything they need in one location.

The new centre is also a boon for expecting moms, featuring 20 private rooms equipped to handle every stage of delivery – from labour and birth to postpartum recovery – all in one room. This makes childbirth more efficient and comfortable, since mother and baby won't have to be moved from room to room.

Other features of the new centre include three birthing rooms for high-risk, Caesarian section and multiple births. There is also a 23-bed unit for expectant moms with pregnancy complications and an early labour lounge for moms who are experiencing contractions but are not quite ready to deliver.

The new centre is also home to researchers and specialists in gynaecology – Sunnybrook is an innovator in treating women with severe gynaecological conditions – and mature women's health.

While the facility has opened, funding is still needed. The generosity of donors like Aubrey and Marla Dan, Pyrali and Gulshan Nanji and many others made it possible to construct the space, more funding is needed to round out the equipment needs and some patient care offerings. ■

# The feel-good formula

Research shows that donating to a good cause increases our sense of wellbeing. But we still need to be prompted to give – and one man says that's all in the math



Taylor Clapham, aged 10, was drawn to give to Sunnybrook because of her grandfather. "He had a heart attack and he went to Sunnybrook and he is still alive today," she wrote to the hospital as part of a Project Give Back assignment she did in class. "Because of you I have learned that giving back to the community is not hard. You just have to put a little heart into it."

There have been countless generous donations to Sunnybrook over the years, but one in particular sticks in the mind of Daisy Tse, vice-president, development at Sunnybrook Foundation.

One snowy winter day an elderly man arrived at the fundraising office, having read about one of the hospital's fundraising campaigns in a Chinese-language newspaper. He had travelled across Toronto on public transit to deliver his donation in person: two crumpled \$20 bills. He hadn't sent a cheque or used a credit card, because he had neither.

"I want to give this to you because I am grateful to the hospital and for the Schulich Heart Centre," Ms. Tse recalls him telling the staff proudly.

The donor's simple act of generosity exemplified the kind of philanthropic spirit that John Hallward welcomes. A newly-launched initiative called GIV3, a project of Mr. Hallward's Montreal-based Hallmont Foundation, has a straightforward goal: to encourage Canadians to give an average 3% of their income to charities and donate three hours of volunteer time each month.

GIV3 grew out of Mr. Hallward's family tradition of giving and his own professional life as a marketing researcher. "I learned about giving back from my family at an early age," Mr. Hallward says. "I'm one of 24 grandchildren who received a cheque on our 21st birthday from our grandmother. The accompanying letter read 'Here's \$500. But it's not for you.'"

Instead, Mr. Hallward's grandmother wrote about his obligation to give to people less fortunate and how we all have a responsibility to help others. She instructed her grandchildren to choose five charities, donate \$100 to each and report back in writing. Successful completion resulted in a \$500 cheque of their own.

"It was a gift but with strings attached," he recalls.

In his professional life as a market researcher, Mr. Hallward authored a book on marketing. "I began to wonder about the focus on selling based on appealing to self-interest and got to thinking about the role of altruism and how it makes us feel better when we give to others."

When he learned that Canadians' charitable giving is well below 1% of annual income, he decided to put his professional research skills to work, launching an Ipsos-Reid survey that probed Canadians' attitudes about charitable giving set against their actual levels of giving.

The survey came up with some surprising results, and was a catalyst to eventual formation of GIV3. Some findings:

- Seven out of 10 Canadians feel they are more generous than Americans, when in fact Americans donate double the

percentage of income per capita.

- One out of every two Canadians donated at least \$100 in 2007 but just one in ten donated \$1,000 or more

- Higher income groups donate a lower share of income (0.5%) compared to versus the less wealthy (1.7%)

- One in four Canadians volunteer with meaningful regularity

The survey also found that Canadians who consider themselves religious and those with a philanthropic role model during childhood are more generous.

The majority of respondents said that Canadians should give 3% of income. "We aren't telling Canadians what amount to give. They themselves have identified what they think are the appropriate percentages

of income for charitable donations," says Woodrow Rosenbaum, executive director of GIV3.

"Even if we got Canadians' charitable contributions up to 1% versus the current 0.72%, it would generate an additional \$3 billion annually for charities and non-profit organizations," he adds.

While GIV3's focus is on increasing overall philanthropic rates, there is special urgency for those of privilege to set an example, says Mr. Hallward. According to GIV3 calculations, the top 15% of income earners in Canada give only 0.5% of their income to charity. If they met the national average it would generate an additional \$1 billion annually. And if they donated at the level of low-income Canadians, it would result in an additional \$5 billion per year.

Mr. Hallward says two findings in the survey stand out: People who give to charity feel happier and more positive; and Canadians care about those in need but don't know how much they should be giving.

"Nobody wants to be a sucker and give more than others in their category," he says, "but neither do they want to be seen to give less."

That's why GIV3's web site provides a tool for determining what to

give based on what Canadians stated in the survey. It's a fast and user-friendly donation calculator – simply plug in salary and investment income to get your recommended level of donation.

The calculator reveals that at \$30,000 the suggested level of giving is \$539 (1.8%), while someone earning \$100,000 should give \$3,630 (3.63%) annually. In addition to helping Canadians understand how much to donate, GIV3 links donors to

partner organizations so they can research organizations they might want to support.

"We want to help Canadians cut through the clutter and noise of charitable requests which are ever-increasing," says Mr. Rosenbaum. "We are encouraging a more thoughtful approach based on planning. We want to make

giving a part of life. It's about sitting down with your family or advisors and making some decisions."

As for the self-interest factor that launched Mr. Hallward's study, it has a positive aspect when it comes to charity. "People feel happier and more positive when they give to others," he says. As part of GIV3's Happiness Presentation, he exhorts others to give for the sheer pleasure of it.

"And we're not asking them to be a hundred-per-cent giving. You can do whatever you like with 97% of your wealth. We're only asking that you be three-per-cent generous."

We are encouraging a more thoughtful approach based on planning. We want to make giving a part of life.

John Hallward  
Hallmont Foundation

## WHAT IT CAN MEAN

By donating 3% of a \$50,000 annual salary, one person can have a critically needed impact. When that impact is added to that of others, the outcome is enormous.

1 PERSON  
two cribs in our Neonatal Intensive Care Unit

4 PEOPLE  
a vital-signs monitor

20 PEOPLE  
a heart valve



165 PEOPLE  
a breast ultrasound machine

X 2,000

2,000 PEOPLE  
fully fund our stroke research program



Dr. Marc Jeschke believes stem cells could be used to create new skin.

## BURN RESEARCH

## The promise of new skin

Stem cells could be the starting point for a whole new approach to healing severe burns

Dr. Marc Jeschke spends his time pondering how to repair the bodies of burn victims, and even though the tools at his disposal are as state-of-the-art as they come, he's not satisfied.

"It's time to find a new approach," he says.

A serious burn is a complex and laborious problem to treat, and Dr. Jeschke and his team at Ross Tilley Burn Centre want to make it easier on both doctors and patients. They are conducting ambitious research to find a better way - and their focus is the use of stem cells to grow new skin.

Stem cells are non-specialized cells that can divide and turn into specialized cells such as bone, nerve or skin cells. They are found in several areas of the human body - the skin, fat and bone marrow - and are naturally present to help with tissue repair.

"The goal with stem cells is to use them to create new skin," says Dr. Jeschke, medical director of the centre. Currently, the primary

method for treating severe burns (25% or more of the body covered in second- and third-degree burns) involves treating pain, preventing infection, and surgically replacing the worst of the burnt skin with either healthy skin from another part of the patient's body (which creates an additional injury) or skin from another source such as a cadaver, Dr. Jeschke says.

Another technique, cultured epithelial autograft (CEA), deploys skin-like material grown in a lab to repair damaged areas. These cultures are created from skin cells derived from the patient's body, but growing them takes six-to-eight weeks - a long, painful time for patients to wait.

The most likely sources of stem cells for the team's burn research come from umbilical cords, or from amnion (a thin layer of tissue that surrounds a fetus during pregnancy). Both are materials that are discarded after a baby's birth. Research has shown that the use of stem cells can



## THE GUINEA PIGS

Innovation has a name at the Ross Tilley Burn Centre. It is the Guinea Pig Club - named with deep pride by its own members. They were the over 600 allied airmen of World War II whose horribly injured and disfigured bodies were reconstructed by Dr. Ross Tilley, one of Canada's only four plastic surgeons at the start of the war. These men were some of the first patients to be treated with skin grafting techniques Dr. Tilley invented during the war. Through his work, he developed standards of care that brought Canada into plastic surgery's modern era.

Dr. Tilley (pictured here) cared not only for the Guinea Pigs' bodies but also their minds. He taught civilians about the healing process and the importance of making these heroes feel welcome in the community, encouraging them not to stand and stare. The Guinea Pig Club was also allowed to drink alcohol in their field hospital wards, making Dr. Tilley a hero to his patients in so many ways.

improve the survival rate of patients suffering from sepsis (a body-wide inflammatory illness).

Stem cells have a huge role to play. They could dramatically improve life for these patients.



Dr. Marc Jeschke  
Ross Tilley Burn Centre

"Stem cells dampen the inflammatory response, they improve the organ function," says Dr. Jeschke, who has a global reputation in burn research.

For burns, stem cells have the potential to work both on the skin surface and on other injured tissue. In previous work, Dr. Jeschke discovered that stem cells harvested from umbilical cord and amniotic membranes can successfully be

triggered to turn into skin, bone and cartilage cells. He says this has exciting potential for treating people who suffer from electrical burns.

"What happens with electrical burns is you lose a lot of soft tissue and bone. If you have stem cells, what you could do is try to fill in the soft tissue damage," Dr. Jeschke says. "It would be ideal for electrically-injured patients who have a lot of muscle, fat and bone loss."

For the next phase of the project, studies on animals such as mice will be conducted to determine how stem cells can be applied to treat wounds - enabling researchers to understand more about their behaviour and develop techniques to use them clinically. After that will come human clinical trials - something that could begin in two-to-four years, Dr. Jeschke predicts.

The eventual goal is to create a bank of stem cells that are immediately available to patients.

"Stem cells have a huge role to play," says Dr. Jeschke. "They could dramatically improve life for these patients." 🐷



TEENS AND DEPRESSION

## Let's talk about it

Students won't usually discuss what's bothering them, due to the stigma of mental illness. So a Sunnybrook team took help directly to the source: the classroom

ILLUSTRATION BY STEVE ADAMS

The death of two relatives in her final year of high school turned her world upside down. Once a highly-motivated, gifted student, she could barely crawl out of bed, let alone find the strength to attend classes.

"I wasn't coping very well," said the now 23-year-old Toronto resident, who requested anonymity. "I almost felt like I didn't have a choice but to get help. What else was I going to do, drop out of high school?"

Depression, an often-taboo topic, was inescapable to this young woman, as it is to others in her age group. Mental illness affects one in five Canadian youth, and about 10% of teenagers experience depression at some time – that's two to three students in each high school class. Many remain undiagnosed, and, as a result, the illness grows more persistent and severe later on in life.

The 23-year-old was among the lucky ones. She was treated by doctors at Sunnybrook's Mood and Anxiety Disorders Program. At the clinic, this young woman and hundreds of others learn to manage their psychological and emotional challenges. Doctors here develop new treatment strategies and lead clinical trials.

But these highly-trained health professionals don't just sit back and wait for young patients to be referred to them. With an understanding of how serious mental-health issues are among teenagers, doctors at the hospital are now going one step further: They are stepping foot in high-school classrooms and reaching out to teens before symptoms of mental illness stunt their academic advancement and social growth.

This past spring, a school-based mental-health care pilot program, funded by the RBC Foundation, saw a team from Sunnybrook come once a week to a Toronto school to speak about mental health issues and how to identify those who suffer from it. They spoke to guidance office staff, teachers and students, and Amy Cheung, a youth psychiatrist and scientist who spearheaded the program, said she immediately noticed a change in attitude when she attended the school regularly. More information about the issue, as well as having professionals available to talk things through, seems to have made the difference.

"There was little resistance," Dr. Cheung said. "There was definitely a lot more openness and understanding about mental illness."

The Sunnybrook team briefed teachers at the school on which signs to watch for in terms of depression and other mental health issues. Signals include change in school performance, fatigue, inattention, sadness, lack of motivation and expressing thoughts about death.

Teachers identified concerns to Dr. Cheung and those students were diagnosed and treated by staff at Sunnybrook. The hope is to expand the program to more schools in the area, a move likely to be welcomed by many schools that struggle to gain access to mental health professionals at a time when more and more children are showing signs of problems

If they can be taught the skills early to cope with what is often a chronic mental illness, they are better able to cope with future recurrences, she said.

One major problem is overcoming the stigma attached to mental illness. Many youth remain undiagnosed not only because of barriers to access, but also due to the fear of being judged by their peers. The illness can be so crippling, it keeps them from excelling or even attending school.

As a parent, Dr. Cheung can understand parents' unwillingness to come to terms that there may be something wrong with their children. The good news is, many strides have



Dr. Amy Cheung  
Brain Sciences Program

Instead of looking at a teenagers and seeing someone who is difficult, not good in school and lazy, people are more likely to say that maybe that teenager is depressed.

or learning disabilities.

At one time, nurses and other health professionals had a daily presence in schools, but funding issues have given priority to other areas and resulted in this being cut back.

"It's a nice reintroduction to health again," Dr. Cheung said about being at the school, "because that's where the kids are. That's the place where you can help them."

With the necessary funding, the program is capable of expanding its reach, Dr. Cheung said.

Already, the hospital acts as a resource to under-served areas where there is little to no psychiatric support. With eight adolescent inpatient beds and 11 child psychiatrists on hand, the hospital takes in youth from other regions. Through another program with the Toronto District School Board, it provides these young people with treatment and a slow and steady reintroduction back into the classroom.

Dr. Cheung said the majority of young people with depression are likely to continue living with it as adults, so treating them early is key. Children as young as 14 are diagnosed with serious illnesses such as depression and obsessive-compulsive disorder.

been made, she said.

"We've done at a very good job of working on stigma. I think one of the things that we've done is we've helped people label things correctly. So instead of looking at a teenager and seeing someone who is difficult, not good in school and lazy, people are more likely to say that maybe that teenager is depressed," she said.

For the 23-year-old woman, receiving help from Sunnybrook's team in dealing with the stigma allowed her to continue with her life. She's on antidepressants, and, although there have been times she hasn't felt as well, she has still managed to attend university and hold down a part-time job.

She has permitted herself to slow down with her life, as opposed to being as focused as she was in high school.

"If it wasn't for the treatment at Sunnybrook I think that I would probably have spent a lot more time trying to figure out what to do and wouldn't necessarily know if I wanted to go back to school, what I wanted to do with my life, how to deal with some conflicts I've had with friends," she said.

"I really couldn't ignore the problem any more." 📌



(Left to right) Dr Laurence Klotz, Dr Rajiv Chopra and Dr. Michael Bronskill discuss the groundbreaking MRI-guided transurethral ultrasound treatment.

## RESEARCH &amp; DEVELOPMENT

## Paying it forward

Sunnybrook's scientists have pioneered a breakthrough device for treating prostate cancer - thanks in part to a patient who helped test it for his son's sake

When Kendall Greasley, a father of three young children, was diagnosed with prostate cancer in September last year, it affected more than his health; it threatened his ability to support his family.

Kendall is a professional airline pilot. "Due to my profession and the strict medical requirements, my aviation licence was suspended until I dealt with the cancer. In other words, until I got rid of the cancer," says Kendall, who formerly worked for the Canadian Armed Forces and now flies with a private airline.

Prostate cancer is one of the most common cancers in men. The Canadian Cancer Society estimates that this year alone, 24,600 men will be diagnosed with prostate cancer and 4,300 will die of it.

Kendall, only 49 when he was diagnosed, had been screened for prostate cancer because his father developed it at the age of 65. More awareness of the disease among younger men and better screening reduces mortality, says Dr. Laurence Klotz, Odette Cancer Centre oncologist, but there is a downside. They also result in a lot of early cancers being identified that may not be clinically significant.

These days, men with prostate cancer have two treatment options: radiation or surgery. Both are invasive and can leave men with reduced urinary, bowel and sexual function.

"The un-met need is an accurate, precise, non-invasive, effective, inexpensive treatment for localized prostate cancer," says Dr. Klotz.

Kendall went to Sunnybrook to discuss his options. Radiation meant a long, possibly two-year, recovery time, so he chose to have his prostate surgically removed – a radical prostatectomy – which would get him flying sooner. His family, who live in Dubai, includes his wife Diane and children Karmelia, 11, Kendra, 10, and Lincoln, 8.

Even as he struggled with his own diagnosis, Kendall's thoughts also turned to his son Lincoln. He believes there's a good chance Lincoln may one day develop prostate cancer, as the disease seems to run in the family. So Kendall agreed to enter an early clinical trial of a future treatment developed at Sunnybrook called MRI-guided transurethral ultrasound.

The new, one-of-a-kind device combines high-intensity ultrasound with magnetic resonance (MR) imaging. The ultrasound energy is used to generate heat to destroy cancer tissue. During the procedure, the patient is inside an MR imager that every few seconds takes pictures of the heat inside the prostate. The unique temperature changes enable the doctors to control the entire treatment.

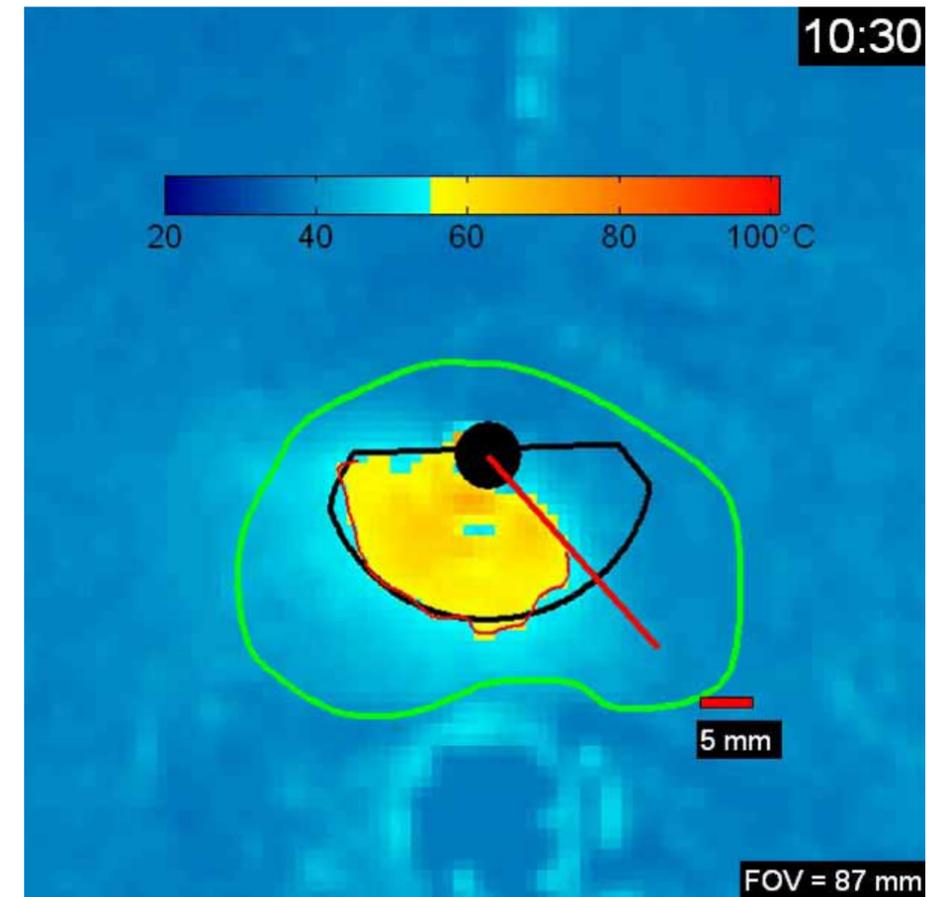
"It's like zapping cancerous prostate tissue with a thermal scalpel, with saving surrounding tissue and critical structures," says Dr. Klotz, who is leading the early clinical study.

The device has been tested so far on Kendall and seven other men, all of whom agreed to take part so researchers and doctors could see if the device works. The project has been partly reliant on the goodwill of funds raised by donors.

According to the study, the device is extremely accurate in reaching its target: within 1.3 millimetres. It takes about 30 minutes, has few complications and boasts a short recovery time.

"It's quick. It's precise. It's not invasive. There's no incision. We hope it will preserve quality of life," says Dr. Klotz. "It doesn't affect continence and erectile function. The next stage is to use it for treatment. That will roll out over the next six months or so."

Kendall then underwent his scheduled surgery, which was a success, and he was able to get his aviation licence back within three months. He calls it "a great 50th birthday present to myself."



This MRI image shows the cancerous area within the prostate that doctors are targeting with the high-intensity ultrasound, while the colour bar records the temperature being generated in the target tissue.

He was glad to give back to Sunnybrook, especially for the sake of his son. "I hope that by taking part in this study I have played a very small part in the overall development of this treatment so that if there ever came a time that Lincoln needed treatment for his cancer, it would be less invasive with minimal side effects so that he can go on and live a normal lifestyle."

Sunnybrook's MRI-guided transurethral ultrasound procedure has been 10 years in the making, says Dr. Rajiv Chopra, a scientist at the Sunnybrook Research Institute. He and senior scientist Dr. Michael Bronskill built it there and are now collaborating with Sunnybrook's Odette Cancer Centre's clinicians and scientists to get it to patients who need it.

"It's been a sprint for a decade," says Dr. Chopra, "and we were able to do this with the support from the Ontario Institute for Cancer Research, the National Cancer Institute,

and the Terry Fox Foundation."

Sunnybrook recently licensed the technology to Profound Medical Inc., a company that will guide it through regulatory approval and prepare it for clinical trials.

"For the technology to get to the person on the street, it had to be commercialized," says Dr. Chopra. "Our goal as scientists is to see it working in patients."

Adds Dr. Klotz: "The potential benefit is huge because each year 150,000 men are diagnosed with localized prostate cancer in North America, and a significant proportion of these men would be eligible for this type of therapy."

And, as Kendall points out, most men have something in common: "We all want to be around to tell our grandkids our old fishing tales, because no one else will believe us." 🐟

# The power of seven

It was a simple idea: have patients consult with seven specialists at one time. The result? Fewer hospital visits, coordinated treatment and better outcomes

Three years ago Claire Bilson was, by her own admission, in rough shape. What she calls “raging arthritis” had seen her go through two operations to replace hip joints and another loomed in the near future. To get around the two-bedroom apartment she shared with her daughter Margaret, she needed a walker.

Years of prednisone taken to alleviate the arthritis meant she was developing cataracts and was at risk for glaucoma. Throw in diabetes and polymyositis, a painful weakening of the muscles. The quality of her life at just 68 was at a low ebb.

Then her physician, Leslie Nickell, suggested Claire become part of a pilot project she was organizing with four other family doctors at Sunnybrook. It was called IMPACT – Inter-professional Model of Practice for Aging and Complex Treatment.

The idea was to improve the quality of care for elderly patients with complex diseases. Instead of booking separate appointments with different specialists, each patient would meet with a team of seven health care professionals at one time.

Dr. Nickell and her colleagues believed that this collegial approach could lead to better coordination of treatment and a deeper understanding of patient needs. Seven sets of eyes looking at complex problems at once might prove better than just two eyes looking at different parts of the overall problem. This could mean better outcomes, fewer hospital visits and an improved quality of life for the patient. Claire felt she had nothing to lose.

The results of that three-hour session spent with the Sunnybrook seven – nurse educators, physiotherapists, pharmacists, specialists in endocrinology, rheumatology, gerontology and any other disciplines that Claire had a need for – were remarkable, she says. “They got me into physiotherapy twice a week and now I don’t need a walker. They helped me take up beadwork as therapy for the arthritis in my hands, so now I have a hobby. They checked all 17

medications I take to make sure they didn’t conflict with each other. Most of all, they gave me the sense that I was getting really first-class care.”

Claire was one of 180 elderly patients in IMPACT’s first year, 2007-2008. That number was slightly larger in its second year of operation, says Dr. Nickell. While not all patients showed improvements as dramatic as Claire, almost all benefited from IMPACT’s unique approach. But the future of IMPACT is very much up in the air, says Dr. Nickell. She and her colleagues were only able to secure \$800,000 in funding – \$350,000 for 2007-2008 and \$450,000 for the following 18 months, a sum which would include post-pilot analysis and measurement of results. The grants came from Health Force Ontario, the province’s health professional recruitment agency.

“There is an understanding that we

will face more elderly patients in the future and that they will have more chronic conditions and more complex medical issues,” says Dr. Nickell. “We wanted to find new ways of dealing with them so we could improve management of their conditions, give them a better quality of life and by doing so reduce the potential burden they place on hospitals and other health care resources.”

Dr. Nickell believes IMPACT has proved worthy. While its future is uncertain, similar models are getting trial runs at other hospitals. Health care authorities in Spain and Ireland have also expressed an interest in IMPACT’s results. 📍

Claire Bilson, shown with her daughter Margaret, says the IMPACT diagnosis project helped improve her health.





PHOTOS BY DALE RODDICK

## CONSTRUCTION

## Building for the future

If you've visited Sunnybrook recently, or even just driven by, you have likely noticed that our facilities are changing fast. With the help of donors, we're building – a lot. The *Campaign for Sunnybrook* is an ambitious \$470-million fundraising effort that will see Sunnybrook transformed by 2014. With matching funds from government, close to \$800 million will be invested, making Sunnybrook the most advanced hospital in Canada.

The need to do so is pressing. The most critically ill and injured patients in Ontario find themselves in our care. To meet this life-saving need, significant investment in people, equipment and facilities is required. Whether it's innovations to help find a tumour sooner than ever before, or adding more space to help a nurse care for a premature baby, every project in the *Campaign for Sunnybrook* is urgently needed, and will make a tremendous difference to families when it matters most.

These are some of the projects currently underway.

### Breast Cancer Centre

Innovations developed at the new Sunnybrook Breast Cancer Centre will save the lives of thousands of women facing breast cancer here and around the world. As the only centre of its kind in the country, one of every ten Canadian women with breast cancer will be treated at Sunnybrook. Our existing facilities can no longer accommodate escalating demand. The Breast Cancer Centre will meet this challenge head-on, increasing space for clinical care, education and research.

Patients can look forward to rapid assessments, reduced treatment times, greater access to minimally-invasive, image-guided breast-conserving surgery, and novel radiation therapies more tailored to each individual. Construction of the outer shell of the new 30,000 square foot Breast Cancer Centre is already

complete and we need your help to outfit the Centre and open to care for women in 2011.

**FUNDRAISING GOAL:** \$27 million  
**RAISED TO-DATE:** \$11.7 million

### Women & Babies Facilities

We have built a new home for our Women & Babies Program, but it isn't yet fully funded. This new 120,000 square foot space (about the size of a big box store) will include a state-of-the-art neonatal intensive care unit (NICU). We've added family support areas for parents and siblings, as well as dedicated spaces where parents will learn to care for their new baby, easing the transition from hospital to home. Spaces for high-risk obstetrics, research and breast feeding clinic have been added, along with clinics devoted to gynaecology and mature women's health. Read more about this project on page 33.

**FUNDRAISING GOAL:** \$40 million  
**RAISED TO-DATE:** \$20.5 million

### Brain Imaging Research Centre

By 2020 it is estimated that the biggest public health threat in North America will be brain disorders. As our population ages, stroke, dementias and mood and anxiety disorders will become increasingly common. In fact, the number of people with Alzheimer's disease is expected to double in just one generation. That's why Sunnybrook, already a national leader in brain sciences, will build the Brain Imaging Research Centre to stay at the forefront of brain research and care.

The new centre will feature some of the world's leading scientists, clinicians and analytical experts working together to prevent, detect and treat complex disorders of the brain. Using enhanced technology, they will be able to find problems earlier, develop better treatment plans, and improve the quality of life for patients.

**FUNDRAISING GOAL:** \$9.5 million  
**RAISED TO-DATE:** \$5 million

### Tory Regional Trauma Centre

Thanks to the support of many generous donors, Sunnybrook is nearing completion of its new Emergency Department and the Tory Regional Trauma Centre. The new space features:

- Double the space
- Double the trauma capacity

- New medical imaging equipment including a new CT scanner suite
- 18 new stretcher bays
- Leading-edge infection control mechanisms

**FUNDRAISING GOAL:** \$22 million  
**RAISED TO-DATE:** \$19.3 million

### Centre for Research in Image-Guided Therapeutics

The Canada Foundation for Innovation gave Sunnybrook the biggest grant in the hospital's history – a grant that needs to be matched by donations – to create the Centre for Research in Image-Guided Therapeutics. Unique in North America, this centre will develop and test state-of-the-art medical imaging technologies, therapeutics and standards of practice. Among many other advances, the project includes new clinical research labs, imaging labs and the most advanced chemistry lab in the country. With this resource, our medical minds will explore the answers to life's most vexing medical questions in cancer, stroke, cardiology and so much more.

**FUNDRAISING GOAL:** \$46.5 million  
**RAISED TO-DATE:** \$5.7 million

### Odette Cancer Centre

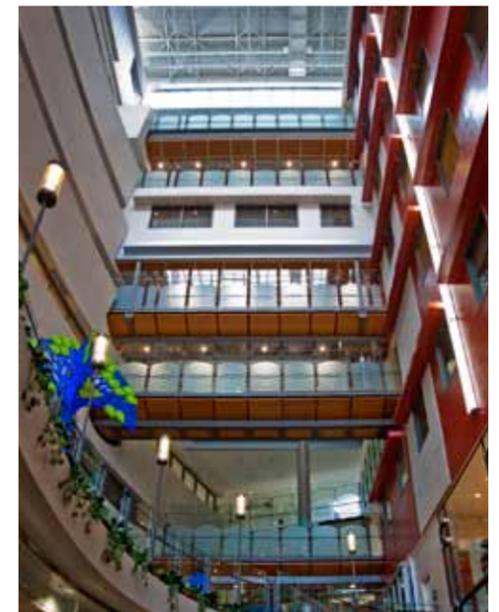
We all know cancer is on the rise. To keep pace with the need to accommodate increasing patient visits, Sunnybrook is redeveloping the Odette Cancer Centre. Originally designed to accommodate 5,000 patients a year, the chemotherapy unit now accommodates more than 25,000 patient visits a year. The expansion will increase chemotherapy treatment chairs from 32 to 42, giving patients enhanced comfort and privacy. The Oncology In-Patient Unit will also be renovated to accommodate 36 patient beds and will feature a patient shower room, expanded physicians/conference room and a new nursing station.

**FUNDRAISING GOAL:** \$13 million  
**RAISED TO-DATE:** \$8.9 million

## INVESTING IN SUNNYBROOK

We need your help to build the hospital that you can count on when you need it most. If you're interested in investing in any of these projects, please complete and send in the donation form you'll find in this magazine. You can also call us at 416-480-4483 or 1-866-696-2008. You can also visit us at [www.sunnybrook.ca/foundation](http://www.sunnybrook.ca/foundation) to find out more.

Four floors have been added on top of M-Wing, with newly built space that is the size of most community hospitals.



# Hypertension and how to avoid it

Here's what the doctor ordered to help you steer clear of the "silent killer"

High blood pressure doesn't hurt. Often, you can't feel it at all. But this silent killer can lurk for years and cause serious diseases. We spoke to Dr. Sheldon Tobe, chair of the Canadian Hypertension Education Program and a staff nephrologist at Sunnybrook. As an expert in kidney disease, Dr. Tobe sees the benefits of managing high blood pressure (or hypertension). "Lowering blood pressure is a relatively low-hanging fruit for risk reduction," he says. "We know how to do it."

## What is blood pressure?

It's the pressure of the blood on the walls of the arteries as it passes through the body. The top number (systolic) is the pressure exerted when your heart contracts and pushes blood outwards. The bottom number (diastolic) is the lowest pressure created when the heart relaxes in between beats. Optimal blood pressure is around 120/80 mm Hg. Increased pressure on the arteries, if left unchecked, can eventually damage arteries and force the heart to work harder.

## Why is hypertension the silent killer?

"People don't know they have it," says Dr. Tobe. The only way to find out if your blood pressure is normal is to have it checked by a health care practitioner. Untreated, high blood pressure is a major risk of heart attack and stroke, kidney disease and dementia. "Know your numbers," he says. "Work with your doctor to keep your blood pressure under control."

## How many Canadians have it?

High blood pressure affects 20% of the adult population. "That has not changed over the last 20 years," says Dr. Tobe. What has changed, he says, is that there have been great strides in the awareness and treatment of hypertension. "People who are aware of their hypertension and are being treated has gone from 13% in 1990 to 66% today. It is a huge success story for Canada."

## What puts me at risk for hypertension?

You may be at higher risk for high blood pressure if one or both parents have high blood pressure, you are obese, you lead a sedentary lifestyle, you drink a lot of alcohol or you smoke.

## What can I do to delay or prevent hypertension?

Here's what Dr. Tobe suggests:

- Reduce your sodium intake to a level recommended by Health Canada. That means less than 2,300 mg/day, and preferably less than 1,500 mg.
- Exercise. Do 40 minutes a day of brisk walking or a physical activity with an equivalent intensity, four days a week.
- Lose weight. Keeping your weight in the normal range reduces the risk of hypertension.
- Cut back on alcohol consumption to not more than 14 drinks a week for men and 10 drinks a week for women.
- Smoking cessation is very effective in preventing cardiovascular disease.
- Relax! Relaxation therapies are effective in controlling high blood pressure.

## So I have hypertension. What now?

If your blood pressure is very high, or you have other illnesses such as diabetes, kidney disease or previous strokes, you may start medication right away. If not, you may be asked to modify your lifestyle and have your blood pressure monitored regularly.

The good news, according to Dr.

Tobe, is "we have enormously effective treatments" for hypertension. There are five classes of medications -- diuretics, calcium channel blockers, ACE inhibitors, beta blockers, and angiotensin II receptor blockers. Within each class, there are many different agents. Your doctor will assess your situation and figure out which medication is best.

Proper prescribing results in fewer deaths, fewer heart attacks and fewer strokes, says Dr. Tobe. "While any medication may have side effects, the benefits outweigh the risks. Early treatment means hypertension is usually brought under control with fewer medications. "If you wait many years, it may take more medications," he says.

## Tell me some good news.

Doctors are using chronic disease management to treat hypertension and information technology systems assure the best information gets to doctors and patients efficiently. "This is unbelievably effective," says Dr. Tobe. "What I've seen as a kidney doctor with an academic career in hypertension, is that every year, many Canadians are not getting end-stage kidney disease. Good medical care including blood pressure control is certainly responsible for that." 📧





LOOKING BACK

# before we were born...

**SEPT 9, 1944:**  
A women's protest over dismal conditions in Christie Street Veterans Hospital in Toronto provided a dramatic backdrop to the birth of Sunnybrook.

Christie Street Veterans Hospital, which opened in 1919 to treat the legions of wounded from World War I, had by 1944 become so overcrowded with the casualties of World War II that it caused a public outcry. This helped hasten the construction of Sunnybrook Veterans Hospital, which opened in 1948. The Christie Street site played out the rest of its years as a seniors' home until it was demolished in 1981, while Sunnybrook became a University of Toronto-affiliated teaching hospital serving the general public in 1966.