

# Sunnybrook

SAVING LIVES, ONE INNOVATION AT A TIME

**WHY THE BRAIN'S**  
CIRCUITRY COULD  
BE THE NEXT  
FRONTIER IN  
MENTAL HEALTH  
TREATMENT

**PHYSIATRISTS:**  
WHAT THEY DO,  
AND WHY THEY  
MATTER (A LOT)

**INNOVATING**  
TO MANAGE  
THE TIDE OF  
SENIORS IN THE  
HEALTH-CARE  
SYSTEM

## When Alzheimer's strikes in the prime of life

Ted and Joanne  
are working  
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researchers  
to fight back



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— Dr. Ellen Warner, oncologist



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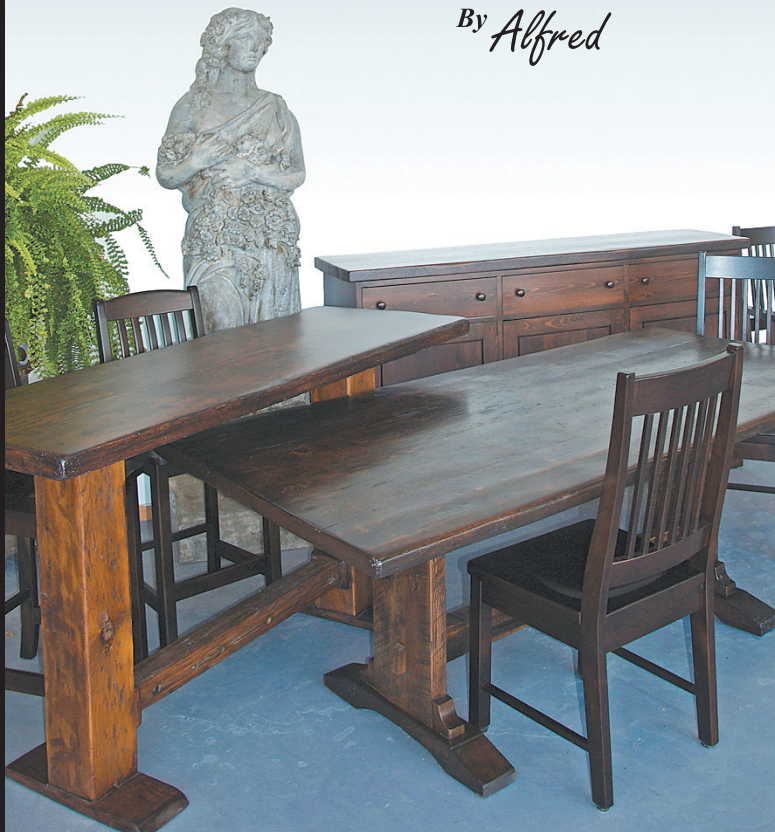
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**ON THE COVER** Ted, who has hereditary early onset Alzheimer's, pictured with his wife Joanne, is taking part in one of two drug trials at Sunnybrook that could spell progress in the battle against the disease. PHOTOGRAPH BY TIM FRASER



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# WE ARE SUNNYBROOK

faces of  
our staff  
and our  
community



## THE ANTHROPOLOGIST

### COMMUNICATION AIDE

A hospital seems an unlikely place to find an anthropologist, but for Lesley Gotlib Conn, it makes perfect sense. "Our approach is the same, whether it's in a hospital or a foreign country. Anthropologists go to a place that is unfamiliar – with a new language and a different world view – and we observe, trying to understand the complexity of that place," says Lesley.

Lesley has been doing just that for the last three years in the Trauma, Emergency and Critical Care Program at Sunnybrook. She was brought to the hospital by Surgeon-in-Chief Dr. Avery Nathens, who recognized the need for different perspectives to improve outcomes for trauma patients.

"Anthropologists bring a different perspective to health services research," says Lesley. She recently studied communication in the Critical Care Unit, interviewing and observing team members for months during their daily routines.

"We wanted to know what it was about working in critical care and surgery that makes communication between staff difficult," she says. The study findings helped to identify the differences in the way the team communicates, enabling recommendations to be made for appropriate improvements.

While studying for her PhD in anthropology at the University of Toronto, Lesley saw herself on a path to becoming a more traditional anthropologist. "I got a grant to go and do fieldwork in French Polynesia," she says. But she discovered the field of medical anthropology just as she was about to leave for the South Pacific. "I cancelled the trip, started doing field work for my dissertation at a hospital and I haven't looked back," she says, adding that she enjoys the unique challenge working in a hospital environment brings. "Establishing a good rapport with people is key to being a good anthropologist. Nothing about what I do is judging – it's understanding."

Beyond the trauma and critical care programs, Lesley has also worked on strengthening inter-professional collaboration throughout the hospital. In one project, she interviewed staff who had been anonymously identified by their team members as being good collaborators. "Most of the time, these individuals were very surprised that they had been nominated by their peers," she says. The findings are being developed into a tool kit and an educational resource for team collaboration. "It was a privilege to talk to and learn from such humble, high-achieving people."

*Sybil Miller*

## THE FINANCE ASSISTANT

## A REFUGEE'S NEW LIFE

When Ohannes Tchamichian arrived in Canada on December 15, 2015, his first impression was "it's cold." He chuckles at his confession, but his smile quickly turns. "Then I thought, 'We are safe here,'" he says.

Ohannes lived in Aleppo, Syria's economic centre and once its most prosperous city. Aleppo is now one of the most dangerous cities in the world, where thousands of civilians are caught in the crossfire of the Syrian civil war.

Ohannes had just graduated from university when the conflict reached his city in 2012. Only a few years earlier, Syria's growing economic potential had inspired him to study finance and banking. But Ohannes moved to neighbouring Lebanon once war hit, continuing his education with a master's degree in business administration.

"We thought the war would be over in a few months – a year, even," says Ohannes. "But the war raged on, and we had to go," he says. "We couldn't stay in Lebanon because it was illegal for us to work there."

Ohannes and his family applied for refugee status in Canada when the opportunity came to resettle. Their new life began six months later.

"Finding a job was difficult, even though I was educated," admits Ohannes. He is now gaining Canadian work experience as a finance and donor relations assistant with Sunnybrook Foundation.

"I'm grateful for my managers' trust and confidence," he says. "Getting this opportunity at Sunnybrook made me feel like I can do this, that I will be OK."

He's proud of the work he does. "We don't have these kinds of [non-profit] organizations in Syria. Even though I am only an assistant, and doing a very small job compared to what the doctors and others are doing in the hospital," he says, "I believe I am doing something to benefit the whole of society."

"When I open donations and read messages from donors thanking Sunnybrook for the care they received here, that's enough for me. Wherever I go I will say with pride, 'I work at Sunnybrook.'"

*Katherine Nazimek*



## THE CLINICAL NAVIGATOR

## HER WORK IS HER PASSION

When Katie Wicik receives a phone call or an e-mail, it's most likely from a family who is desperately looking for answers. As a clinical family navigator with the Family Navigation Project at Sunnybrook, Katie helps find appropriate care and resources for families and youth aged 13 to 26 who are living with serious mental health issues, addiction concerns or both.

As many as two million young people are struggling with mental illness in Canada, yet only one in five receives the help they need. "Knowing that there are always more families in need that can benefit from navigation is the most demanding part of my job," says Katie.

Navigation is the key word here. In a complicated, ever-changing mental health system, families are often not aware of what help is available or they need support finding their way through the maze of programs, services and treatments.

"As a navigator, I provide information and offer a unique bridge that connects families with medical and clinical resources. I am always amazed at what can be accomplished – and how much stronger we are – when we all work together."

Katie's academic training has served her well. With a deep-rooted love for the fields of education, mental health and psychology, she studied psychoanalytic thought at the University of Toronto and then completed her graduate degree in education, counselling psychology.

"I feel an immense sense of pride and commitment being part of Sunnybrook, and I think of my work as my passion and not just a job."

Spending time with her three children is Katie's other passion. She coaches her children's soccer and swim teams, hosts a boot camp and recently took up running. Beyond the physical health benefits, she also exercises for mental health and stress relief.

"I have been trying to make a point of carving out time for me, which then fuels my energy for my work and family."

In September 2016, Katie will take part in the 15-kilometre run in the RBC Race for the Kids, a family event and fundraiser for youth mental health and the Family Navigation Project.

*Sally Fur*



PHOTOGRAPHS BY DOUG NICHOLSON



## THE MEDICAL PHYSICIST

## BUILDING BETTER TREATMENTS

Sometimes the tiniest things make the biggest impact. This is something Dr. Ananth Ravi, medical physicist and operations lead for brachytherapy at the Odette Cancer Centre, knows well.

Brachytherapy is a unique type of cancer radiation therapy. It uses tiny radioactive seeds that are implanted directly in the tumour for highly effective treatment, with less recovery time and fewer side effects than conventional radiation. Not all patients are candidates for this type of therapy, however, but for those who are, it can be a life-saving alternative.

Dr. Ravi completed his undergrad degree at the University of Toronto in engineering science before coming to the Sunnybrook Research Institute to complete his doctorate. He has been with Sunnybrook since 2009, and he helped develop the hospital's brachytherapy program, which has become the largest of its kind in the world.

"The prospect of pure academia didn't excite me," says Dr. Ravi. "Instead, I love using fundamental principles to create tangible solutions that truly help patients. Basically, taking things apart and putting them back together again so they work better is my passion."

Innovation occurs frequently in brachytherapy because one size does not fit all with this type of treatment.

"My most memorable experiences often come from helping to develop a unique option for a patient, like a custom-fit applicator," says Dr. Ravi. "Preventing patients from enduring a more painful or prolonged type of treatment is immensely gratifying. They are happy to have another choice, and that makes me happy."

Dr. Ravi is busy on the home front, with two children under the age of four. "In my downtime, I enjoy building things. I'm working on a built-in bookcase, but sometimes that takes a back seat to keeping the kids from eating the sawdust," he laughs.

Dr. Ravi finds inspiration in the way his team is developing new approaches, while maintaining the quality of what they do on a day-to-day basis. "I'm so proud to be a part of this amazing group. They strive to invent, while managing high volumes of patients who need us. The team and our patients are what keep me motivated and uplifted."

Laura Bristow

## THE PATIENT SERVICES AIDE

## THE SMILING MAN

The saying "laughter is the best medicine" is something Greg Karman lives every day.

As a patient services aide (PSA), Greg's role is essential. It includes housekeeping duties, putting fresh linens on the beds, delivering food trays and some portering. "We feel very valued as a part of the care team. A big reason I'm here is because I get to work with great people," he says.

Greg has worked at St. John's Rehab for 29 years. His mother worked in the admitting department at St. John's Rehab for 25 years, and Greg says, "When I started here, I began having such a good time I never left!" He has held many positions over the years, starting as a porter. Greg later worked in shipping and receiving, then groundskeeping, but he missed getting to know patients. He feels that being a PSA is the best fit for him.

Greg says the best part of his job is interacting with patients and making them smile. "People really enjoy making a connection with someone, and laughter helps you do that. Putting people at ease with silly jokes and stories helps with healing and getting through the day," he says. "Patients in rehab are often dealing with the biggest life changes you can imagine. If I can bring a bit of joy to their day, it's an honour."

Greg has been happily married for 20 years, with two sons he is extremely proud of. He loves getting away to the family cottage in the summer, which has been a part of their tradition for decades. In his spare time, Greg plays the drums with his blues-rock band, which supports charitable organizations through their gigs. "Music and giving back is very rewarding for me."

At the end of the day, it's the little gestures for which Greg is known. "It's amazing how much of a difference you make just by helping patients open up their [dresser] drawer or by asking how their day is going. People call me 'The Smiling Man,' and that is the biggest compliment."

Laura Bristow



THE LAB TECHNOLOGIST

# EXPERT AT THE MICROSCOPE

Angelo DiNardo first noticed something was wrong nearly three years ago, while playing basketball in the men's league he organizes. "I had a burning feeling in my throat and chest, and I just knew something wasn't right," Angelo says. With a family history of heart disease in the back of his mind – his father passed away suddenly in his 40s – Angelo immediately scheduled a heart stress test at Sunnybrook, where he has worked in the Microbiology Lab for three decades.

After an angiogram found blockages, Angelo underwent triple bypass surgery that same month. "Since I've worked at Sunnybrook for so long, I was confident the surgery would go well. The Schulich Heart Program has a good reputation, and I knew I was in very good hands," he says.

The surgery was a success, and he was able to return to his job at Sunnybrook as a medical laboratory technologist. As a patient, Angelo gained a new perspective on just how important the work is that he does in the lab.

"When physicians want to know what's causing an infection in a patient, we test the bacteria sample and identify the organisms, which helps them figure out which antibiotic should be used to treat the patient," says Angelo. "I really enjoy working in the lab because there's never a dull moment. Bacteria and organisms are constantly changing and evolving, so there's always something new to learn."

Angelo discovered his passion for microbiology early in life. "Growing up, I loved playing with the microscope, doing experiments and pretending to be a scientist," he says. He is now teaching the next generation of medical laboratory technologists, working part time as a lab instructor at the University of Ontario Institute of Technology.

In addition to teaching, Angelo recently went back to school. After studying part time for five years, with a brief interruption for his heart surgery, he graduated this year with a bachelor's degree in allied health science. "Learning, teaching and making improvements have always been an important part of my life," he says. "I'm forever grateful to the cardiology team for helping me get back to doing what I love."

Sybil Millar



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PHOTOGRAPH BY DOUG NICHOLSON

# ALZHEIMER'S ON TRIAL

Sunnybrook is taking part in two global studies that could offer the best hope yet for answers on how to stop the destructive disease in its tracks

By Marjo Johne

*Ted, who has autosomal dominant Alzheimer's disease, is taking part in the DIAN-TU drug trial at Sunnybrook.*



**H**is mother, an aunt and three uncles: in the previous generation alone, Ted has lost five close family members to Alzheimer's disease. Another uncle – one of the six out of nine siblings who were diagnosed with the disease – is now in long-term care.

So it felt especially cruel when Ted's doctor told him eight years ago, at the age of 44, he had autosomal dominant Alzheimer's disease (ADAD), also known as early onset familial Alzheimer's disease. It was the same condition that had claimed the lives of his mother and her siblings when they were in their 60s.

"That's the scariest part," says Joanne, Ted's wife. "They died so young – it's really frightening when you think about it."

Since the diagnosis in 2008, Joanne and Ted have lived in a state of anxious anticipation – watching and waiting for worsening symptoms of ADAD, a disease caused by rare, inherited gene mutations whose effects typically start to appear when patients are in their 30s and 40s.

But the Toronto-area couple is also hopeful. Earlier this year, Ted, a former entrepreneur (who asked to be identified only by his first name), became one of the first Canadians to participate in a global study looking at the potential of antibody drugs to prevent or slow down the development of early onset ADAD, a rare form of Alzheimer's found in less than one per cent of patients with the disease.

A positive test for any 1 of three ADAD gene mutations virtually guarantees the onset of Alzheimer's disease, and also means there's a 50-50 chance of passing on the gene mutation to children.

"(ADAD) is quite aggressive, so it's important to have these trials going on," says Ted, now 52. "We want to help and be part of finding a cure."

The Dominantly Inherited Alzheimer Network Trials Unit



Above: Ted (left), who was only 44 when diagnosed, relaxes at home with his wife Joanne.

(DIAN-TU) study is one of two research projects at Sunnybrook investigating the use of drugs to prevent or slow memory loss caused by Alzheimer's disease, which currently affects an estimated 750,000 Canadians.

Both studies are using therapeutic drugs to target beta-amyloid, a toxic brain protein, which can deposit in amyloid plaques outside the nerve cells, damaging the brain leading to memory loss, word-finding difficulty and other cognitive problems.

The studies hold exciting promise for patients in the early or presymptomatic stages of Alzheimer's: a chance to live

life with their memories and intellectual abilities intact, for much longer than they would likely have been able, if the anti-amyloid antibody drugs work.

The studies are international in scope. DIAN-TU, led by the Washington University School of Medicine in St. Louis, Mo., has sites in the United States, Canada, the United Kingdom, Germany, Australia and Argentina.

The second study – called Anti-Amyloid Treatment in Asymptomatic Alzheimer's, or A4 for short – has site locations in the U.S., Canada and Australia, all coordinat-

“  
**It's important to have these trials going on. We want to help and be part of finding a cure.**  
”

Ted, 52, early onset Alzheimer's patient



Dr. Sandra Black (left) & Dr. Mario Masellis.

ed through the University of Southern California's Therapeutic Research Institute.

DIAN-TU's focus is on early onset familial Alzheimer's, while the A4 study is focusing on late-onset Alzheimer's disease (AD), testing participants aged 65 to 85 who have family or other risk factors for AD, but do not yet have the disease.

"If we can start removing the beta-amyloid early enough, we hope to postpone this pathology from expressing itself. Maybe we can control this rogue protein before it spreads its toxic effects through the brain," says Dr. Sandra Black, director of Sunnybrook's Hurvitz Brain Sciences Program and lead investigator of the A4 trial at Sunnybrook, which is looking to study 10 elder volunteers who are at risk of AD, often because of a family history.

Scientists believe amyloid build-up outside nerve cells can cause inflammation and prevent cells from communicating with each other. It may also lead to deposits within nerve cells, called tangles, made up of the second major misfolded protein seen in Alzheimer's, called tau.

Normally, tau stabilizes channels that transport nutrients and proteins from the nerve cell body to the nerve endings, where they make contact with other nerve cells.

"In diseases like Alzheimer's, the tau starts to misfold and deposit inside cells. This abnormal form spreads from one nerve cell to other nerve cells that are functionally connected, degrading that functional network," explains Dr. Black. "We're not quite sure how amyloid and tau work together, but it seems that if you have beta-amyloid deposits, you are more likely to have tau deposits as well. Mobilizing and removing the amyloid may remove an inciting factor that promotes the tau tangles."

The A4 study is testing the antibody drug solanezumab, while DIAN-TU is testing both solanezumab and a second drug, gantenerumab. Both drugs are designed to bind to amyloid – each drug targeting a different part of the protein – to help move it out of the brain.

While previous studies have looked at ways to treat Alzheimer's disease at various stages when it is already causing problems, DIAN-TU and A4 are groundbreaking, because they focus on individuals who are at risk of developing Alzheimer's, but show no symptoms of the disease at the start of the trial.

DIAN-TU is also the first to focus on prevention or delayed development of early onset familial Alzheimer's. In addition to cognitive testing, biomarkers such as amyloid levels in the cerebrospinal fluid and in the brain are being used as outcome measures.

"Traditionally, studies of Alzheimer's disease will just use memory tests to measure outcomes," says Dr. Mario Masellis, lead investigator for the DIAN-TU site at Sunnybrook. "The problem with this is that people with early stages of the disease often don't have a measurable deficit.

With DIAN-TU we looked at developing something that can act as a surrogate measure of the benefits of the drugs being tested – something more sensitive and indicative such as amyloid uptake in the brain.”

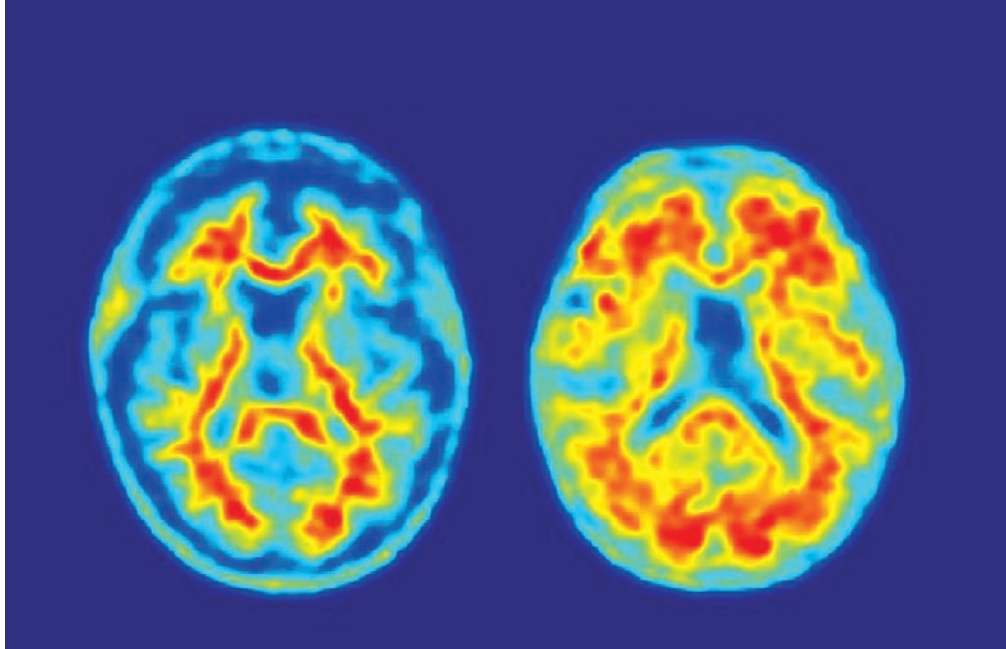
DIAN-TU will follow an “adaptive clinical trial” approach, testing two drugs simultaneously to allow researchers to advance quickly if one drug shows more promise than the other or, conversely, to stop testing a drug that produces adverse side effects without halting the entire study. With this adaptive model, new drugs may be added as they become available, says Dr. Masellis.

The use of advanced imaging technology also sets DIAN-TU and A4 apart from other studies on Alzheimer’s prevention. For example, in both studies, participants undergo an amyloid PET scan, which uses a radioactive tracer designed to bind to amyloid in the brain to quantify the extent of amyloid deposits in the brain. In A4, if the amyloid scan is positive, the participants are then randomly assigned to get solanezumab or placebo infusions monthly for three years.

“It used to be that you could only detect deposits of brain amyloid in the brain in an autopsy, but now you can see this in people while still alive,” says Dr. Black. “Also, in the two to three years since the study started in the U.S., a radio-tracer has been developed that can detect tau in the brain, so that’s now also offered to participants of both studies.”

Getting people to sign up for the studies is not an easy task. With both A4 and DIAN-TU, being accepted into the treatment trial essentially confirms what most people don’t want to hear: that they’re likely to develop Alzheimer’s.

“The majority of people don’t want to find out,” says Dr. Masellis. “It can affect their insurance, career or job, or



These PET scans, conducted using a compound that binds to amyloid in the brain, show the remarkable difference in amyloid levels between individuals. The left image shows a 77-year-old woman with low amyloid burden, while the right image belongs to an 89-year-old woman who is amyloid positive.

## Sleep and Alzheimer’s: researchers studying links

A good night’s sleep does more than banish fatigue and get the mind and body ready for another day. It may also help lower the risk for dementia by utilizing the brain’s waste removal channels, called perivascular Virchow-Robin spaces.

Brain scientists at Sunnybrook looked at the brain scans and overnight sleep study results of 26 patients who had a stroke or transient ischemic attack (TIA), also commonly referred to as a mini-stroke. They found that these patients had enlarged perivascular spaces – which can be seen on 3-D MRI brains scans – suggesting blockage of these channels.

These findings are the first to show, in humans, a link between poor quality sleep and enlarged perivascular spaces – the fluid-filled channels that

surround the brain’s blood vessels to drain toxins and waste products, especially during stages of deep sleep.

“We looked at the volume of perivascular spaces on their MRI scans and correlated them with markers of sleep fragmentation from their sleep studies,” says Courtney Berezuk, the study’s co-lead author and a neuroimaging analyst in the L.C. Campbell Cognitive Neurology Research Unit at Sunnybrook, directed by Dr. Sandra Black. “In those with poor-quality sleep, the enlarged perivascular space volumes were larger than those with healthy sleep patterns.”

Previous studies have shown a cause-and-effect relationship between fragmented sleep and a higher risk of cognitive diseases such as Alzheimer’s and dementia.

“Sunnybrook’s work with enlarged perivascular spaces are an extension of these studies,” says Dr. Mark Boulos, the study’s principal investigator and stroke and sleep neurologist in the Hurvitz Brain Sciences Program at Sunnybrook.

“These findings could be particularly important for patients suffering from stroke or dementias such as Alzheimer’s disease, which are thought to arise from the build-up of toxic amyloid protein in the brain, as sleep may be an important factor in their development,” says Dr. Boulos.

“Since many sleep disorders that give rise to sleep fragmentation are readily treatable, this research holds the promise of providing a novel therapeutic option for patients living with the effects of stroke or other brain diseases,” he adds. •



PHOTOGRAPH BY TIM FRASER

their outlook on life, but if a new therapy is developed then maybe more people would want to be tested.”

One participant in the A4 trial at Sunnybrook, a retired nurse whose parents both had serious memory-loss problems – although they were never officially diagnosed with Alzheimer’s – said she signed up for a number of reasons.

“For me it’s to get information on what’s going on with Alzheimer’s, and to get myself prepared for the future,” says the woman, a Toronto resident who asked not to be identified. She said she is selling her house and getting her affairs in order in the

“  
**I am extremely hopeful that Ted is receiving the drug and that it will slow down his symptoms.**

Joanne, Ted’s wife

”

event she becomes debilitated by loss of cognitive function down the road.

She hasn’t told anyone in her family she’s part of the A4 study, although she did mention to a sibling that she was getting tested for amyloid build-up.

“And my sister told me she wouldn’t want to know,” says the woman.

With the A4 and DIAN-TU studies, by luck of the draw, one group gets monthly infusions of antibody, while the other group gets infusions containing no active drug. For Ted and Joanne, this means taking a chance – and embracing an opportunity. So far Ted remains functional

in his day-to-day life, but his short-term memory has deteriorated over the last eight years and he tends to repeat himself. As a result, he tends to be anxious in social gatherings, notes Joanne.

“I am extremely hopeful that Ted is receiving the drug and that it will slow down his symptoms,” says Joanne. “And then there’s the next generation – if this trial goes well and there’s a cure 10 years down the road, there’s hope for our two children and Ted’s many cousins who are younger than him, as well as for other people who may unfortunately inherit the gene for this disease.”



Michael Kennedy's leg was crushed in a motor vehicle collision.



The Sunnybrook team is helping him through the long rehabilitation process.

## PHYSIATRISTS: ON THE FRONT-LINES OF REHAB

*They are the unsung heroes of recovery, specialists who help seriously injured patients get their body and soul back together – no matter how long it takes*

By Paula Last

**A**fter his serious motor-vehicle crash, it fell to surgeons to put Michael Kennedy's bones back together and a team of specialists to start rebuilding his life.

Michael, a 26-year-old contractor from Halifax, was airlifted to Sunnybrook from Florida after the right side of his body was crushed. He was the passenger in a truck that collided with another vehicle on the highway. After arriving at Sunnybrook and undergoing countless surgeries, Michael met physiatrist Dr. Matthew Godleski. "Matt," as Michael calls him, was there to figure out what happens next.

Physiatry emerged as a field to help Second World War veterans returning from the battlefield. Physiatrists are medical doctors who have completed training in the specialty of physical medicine and rehabilitation. They prescribe therapies and manage the patient's rehabilitation and recovery to help seriously injured patients not only heal, but

also regain function. They do that by treating the whole person.

"These patients not only have shattered bones," says Sunnybrook physiatrist Dr. Ed Hanada, "but their lives in an instant are changed." It takes a team of rehab specialists – including occupational therapists, physiotherapists, social workers and nurses – to help rebuild these lives. Dr. Hanada also invites the clergy to weekly meetings.

Sunnybrook recently shifted the start of the rehab process to begin as early as possible after a trauma patient enters the hospital. Sunnybrook's St. John's Rehab physiatrists are involved at the acute care stage in the Intensive Care Unit and trauma wards.

"Traditional practice had been to treat trauma patients in the acute care program, and after they were deemed ready, send them to the rehabilitation centre," says Dr. Larry Robinson, chief of rehabilitation services and St. John's Rehab program at Sunnybrook. But evidence shows starting

the process in acute care creates a better chance for long-term healing and more fulsome function.

"The physiatrists are starting the rehab process early and proactively, by asking questions such as: 'What does a patient's mobility and function look like? What will their activities of daily living look like when they get home? What does their physical home environment look like? How might it need to be adjusted?'"

Improving function requires a comprehensive assessment that addresses more than an isolated task like picking up a pen and writing. Physiatrists want their patients fully active in their communities as quickly as possible. As Dr. Robinson puts it, "I want my patients to do more than survive – I want them to succeed."

That's why Dr. Robinson, along with Drs. Hanada and Godleski, are evaluating how early intervention impacts patient outcomes. They are gathering data on how long patients

PHOTOGRAPHS BY TIM FRASER

stay in hospital, their ability to function and how complications are prevented. The doctors' interest lies not only in how patients are doing during their treatment, but also their quality of life in the future.

When Michael woke up in the hospital, he started thinking about just that.

He describes himself as an active guy before the crash, so it's no surprise that his mind quickly turned to getting his life back. For him, that meant saving his leg.

"Someone who has an amputation may think they'll never walk again," says Dr. Robinson. A physiatrist in acute care educates patients about what is possible and helps them cope with their fears. Of course, the opposite response can also happen. "A patient may expect to put on a prosthesis and walk out the door, and we need to help them understand what's realistic," he says.

Fortunately for Michael, his leg was saved. Now at home, he continues to work on regaining function.

#### HOW PHYSIATRY WORKS

Physiatrists focus on assessing patient function, which includes things like mobility (ranging from moving in bed to walking), bladder and bowel function and future ability to do activities of daily living (ranging from dressing to cooking). Next, they take comprehensive histories: physical, family and functional. Physically, they're monitoring heart and lungs, muscle and skeletal systems, plus range of motion, strength and sensation. Finally, they work with the health-care team to determine a course of action, whether it's physiotherapy, occupational therapy, speech therapy, assistive devices or medication.

The assessment also helps physiatrists identify other issues. Complications like



Car crash survivor Patricia Prenger praises the collegial approach of the rehab team.

pressure sores and contractures (tightening of the muscles or tendons that can lead to a restriction of movement) and tightness in the joints can arise in acute care. For example, Dr. Hanada says they keep an eye on the Achilles tendon, "making sure the foot isn't pointed downward and forcing a patient to walk on their tiptoes." Attention from a physiatrist at this stage is crucial because patients may be too unwell to recognize additional injury.

Once a patient is stable enough to make the move to rehab, the physiatrist continues with their care, acting as a critical link across different treatment sites. Physiatrists understand their patients can be at their most vulnerable at the points of transitions in care, when moving from acute care to rehab, rehab to outpatient and from the outpatient clinic to home.

For Michael, knowing that his physiatrist

was in charge of his care plan from start to finish gave him the peace of mind he needed to accept his situation and focus on recovery. "Time and energy are pretty serious when you're trying to heal," he says. "The smallest, littlest things take so much energy and time out of your day." Having to coordinate his care in addition to rehab would have been "too much."

A smooth transfer of care also made a world of difference to Patricia Prenger, 52, one of Dr. Hanada's patients. Patricia, a high school teacher from Bowmanville, Ont., was driving to school on a Monday morning when she was hit by another car. She doesn't recall being cut from her vehicle, or the names of the countless people who circulated past her hospital bed. But she is acutely aware of how rehab helped prepare her to go home from day one.

"Everyone – therapists, nurses and



PHOTOGRAPH BY TIM FRASER

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## Proof of concept

Evidence has long shown that patients seen by a physiatrist in acute care have better outcomes later on.

A 1992 study published in the *Archives of Physical Medicine and Rehabilitation* looked at in-patient rehab patients with a traumatic brain injury (TBI). Those who received a physiatry consult and multidisciplinary rehab

while in acute care had a shorter stint in rehab than those who didn't. TBI patients who received the intensive rehab also had a higher cognitive level on discharge and were more often discharged home than to an extended care facility.

Similarly, a 2003 study published in the *American Journal of Physical Medicine and*

*Rehabilitation* also found positive outcomes. It reviewed 1,866 TBI patients, finding that a physiatry consult less than 48 hours after admission improved patients' ability to move and shortened their stay in acute care.

More recently, a 2016 study published in the *American Journal of Physical Medicine and Rehabilitation* reviewed

the literature on acute care physiatry consults. It concluded that "Studies in this area have all demonstrated improvements in outcome measures with early physiatry consultation within each study's select population; presumably, health-care and societal costs would also be reduced in these populations as well."



Dr. Hanada – make you feel like you’re a player on the team, and they have strong expectations for you. It really does feel like you’re central to your own progress,” Patricia says.

After setting recovery goals, the ongoing respect and consistent collaboration with her health-care team kept Patricia going – from more than a month in a wheelchair, to her first steps on a cane, and finally, home. She describes Dr. Hanada as an engaged presence and a “fluid partner,” the glue of the team. And this kind of seamless care doesn’t only happen from one site to another, but also within the walls of the rehab centre itself. Having access to therapy rooms on the weekend got her home that much quicker.

The one thing physiatrists can’t fix is the anxiety many patients experience between therapy sessions. That’s where other patients come in. Patients frequently form bonds that create a sense of camaraderie and an environment where they can work together through loss. They console each other when there is failure and celebrate successes big and small. Those emotional connections

are critical to healing.

Patricia and her fellow patients also shared another key ingredient to recovery: laughter. “Sometimes we would joke about ‘meeting at the bar,’” she says. But not that kind of bar – the parallel bars used for exercise therapy. Patricia also counted on the “rollicking laughs” from a couple of therapists. A sense of humour can be crucial to recovery.

**BAND OF BROTHERS**

Several of Dr. Godleski’s patients also found each other at rehab.

Kyle Rowe, 25, a contractor from Scarborough, Ont., was in shock after being admitted in November 2015 for reconstructive surgery on his leg. At St. John’s Rehab, he found a pal in 33-year-old Richard Deathe. Richard, a farmer, suffered significant burns in a kitchen fire. The pair became a trio when Michael Kennedy arrived after surviving a car collision in Florida.

“It makes days go by faster, makes the

Physiatrist Dr. Matthew Godleski helped Michael Kennedy through the recovery process.

process a lot less depressing,” Kyle says.

The three friends are now home and stay in touch, but their journey through the health-care system hasn’t ended. In fact, the final transition from the safety net of rehab can be the biggest challenge.

“Reality sets in more when they’re at home,” says Dr. Hanada. “It’s not uncommon for patients to go home still using crutches or a wheelchair. Since patients may think they’re harming themselves by bearing weight on their injured limb, and then feel reluctant to do it, it’s a difficult line to walk: they need to tolerate some pain to recover, but also know when to pull back.”

Enter Sunnybrook Research Institute scientist Sara McEwen, who is also trained as a physiotherapist. Her research focuses on teaching patients how to solve problems that can arise in the real world. Instead of just showing a patient how to move from a bed to a chair, she helps the patient figure out how to move from one surface to another in different situations. Showing patients how to problem-solve their way home is one tool Dr. Robinson believes will help achieve the long-term success he wants for his patients.

Dr. Hanada, for his part, says his job isn’t done until he carries the news of his patients’ recoveries back to the people who saved their lives in the first place in acute care.

“It’s the best part of my job.”

## A special approach for burn patients

Patients with burn injuries especially need early attention from a physiatrist.

Dr. Matthew Godleski is one of only a handful of physiatrists in North America specializing in burn rehabilitation. He is well-versed in both the physical and social aspects of recovery.

His research has taken on a common physical complication

for burn injuries: soft tissue contractures (when muscles or tendons tighten and constrict movement). The American Burn Association is paying attention and recognized his work in May. They selected a recent study of his, as one of six top abstracts for their annual conference.

The study documented the severity and patterns

of contractures in burn patients from 1994 to 2003, which helps provide a baseline, for future contracture prevention and treatment efforts.

Dr. Godleski also understands that tending to patients’ emotional well-being and mental health is crucial. “Scars can have a huge impact on how people feel with friends,

family and that five-year-old on the bus with mom who asks, ‘What happened to you?’” he says.

Despite the challenges people with burn injuries face, Dr. Godleski says his patients often accomplish more than they expect. He says even patients with severe burns can regain quality of life with effective rehab.

PHOTOGRAPH BY DOUG NICHOLSON



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KIDS

# A seniors' moment in health care

Our aging population is dominating inpatient numbers in Canadian hospitals, and Sunnybrook is taking the initiative to improve their care and quality of life

By Stephen Knight

Teresa Kowalczyk, shown with her grandchildren, spent months in the Sunnybrook system after contracting bacterial meningitis.

For Teresa Kowalczyk, Sunnybrook's approach to caring for seniors is not an abstract concept. It's something that helped save her life.

In April 2009, she was rushed to the emergency department of her local hospital where she was diagnosed with bacterial meningitis, a disease that affects the membranes surrounding the brain and spinal cord. Left untreated, the disease can be fatal in a matter of hours. Patients can suffer damage to the brain after recovery, and speech and mobility can be permanently affected.

Teresa, now 79, was in the Intensive Care Unit (ICU) for six weeks, either unconscious or sedated. She then spent four months recovering at another facility before she entered Sunnybrook's W. P. Scott Geriatric Day Hospital.

"When I came to Sunnybrook, I was shaking. I didn't know what to expect, but they were very friendly and had patience with my disability," says Teresa, who is still relearning some speech skills following her illness. "They paid attention to my needs. After a few visits, I felt like I was at home. There were many activities like physiotherapy and painting. Everyone has a smile on their faces, and they treated me with respect, as a normal person."

For Teresa's husband, Victor, it was a turning point. "Sunnybrook's Day Hospital was the missing link," he says. "That's where Teresa started to be an independent person again. She can take Wheel-Trans by herself. She is gardening, she can walk to the hairdresser. I couldn't imagine it when she could only move one finger [in the ICU]. The program is tremendous."

As a senior citizen who spent many months under Sunnybrook's care, Teresa's case is typical of the demographic shift that is happening at hospitals across Canada.

Senior citizens are the fastest-growing age group in Canada, which means health-care professionals have to pay attention to the unique needs, opportunities and challenges presented by this bulging population cohort. How significant is the greying of Canada? According to Statistics Canada, about five million Canadians were aged 65 or older in 2011. This number is now expected to double in the next 20 years, reaching 10.4 million seniors by 2036. From a health-care perspective, the aging of the baby boom generation, combined with an increase in life expectancy, means taking a different approach to patient care.

In 2011, the most recent date for which statistics are available, 52 per cent of the patients served by Sunnybrook's programs (excluding women and babies, and veterans) were over 65 years of age. Although seniors made up 14 per cent of the population in 2011, they accounted for 63 per cent of all in-patient days in Ontario.

Sunnybrook, which has a distinguished history of caring for seniors, recognized the

population shift early and made senior-friendly care a priority almost a decade ago.

"It's not just about being nice to older people," says Dr. Barbara Liu, a geriatrician at Sunnybrook and executive director of the Regional Geriatric Program of Toronto. "Senior-friendly care requires a comprehensive approach to implementing best practices, providing an accessible environment, overcoming systemic barriers and addressing all aspects of care delivery, from attitudes to the emotional and behavioural side. Seniors often have the greatest needs, yet they are the most reluctant to ask for help."

One of the challenging areas where Sunnybrook and other hospitals are making strides is with elderly patients who have delirium, an acute and fluctuating state of confusion characterized by inattention, disorganized thinking and changes to level of consciousness. New ways of treating delirium and reassessing current methods with an eye toward less reliance on drugs are aimed at improving outcomes for patients. This grew out of a concern that seniors, particularly those in long-term care facilities, are being overprescribed powerful medications that can have major side effects. A February 2016 report from the Canadian Institute for Health Information found that 39 per cent of long-term care residents were prescribed an anti-psychotic drug at least once in 2014.

The Sunnybrook senior-friendly team addressed the problem with a grant from the hospital's Alternate Funding Plan (AFP) Innovation Fund to start its Anti-psychotic Stewardship Program.

"The program is a second look at elderly patients who are prescribed anti-psychotic medications, a class of drugs used to reduce or relieve symptoms of psychosis such as delusions or hallucinations," says Deborah Brown, a nurse practitioner. "We're piloting an anti-psychotic stewardship program which is the first of its kind in an acute care setting."

Brown says delirium is preventable, but barriers persist, including gaps in understanding its root causes. She says simple things like speaking to community care providers and engaging more with family members of patients are critical to more person-centred care, rather than seeing someone solely as a patient.

"Using validated screening tools such as the Confusion Assessment Method [CAM], we can get a better idea if there has been changes to a patient's baseline, which is how they were before they came to the hospital," says Brown. CAM is a screening tool that allows clinicians to efficiently assess for the presence of delirium.

Another key area of focus is mobilizing patients early in their hospital stay. The act of walking or even moving from a hospital bed to a chair is better than bed rest and this has shown to reduce the incidence of delirium, as

## Dedicated to seniors at Sunnybrook

**W.P. Scott Geriatric Day Hospital** Opened in 1973, this is a time-limited out-patient program where the health-care team designs an individualized care plan and patients attend once or twice a week, for three to five weeks.

**Falls Prevention Program** Run by a registered physiotherapist, this six-week, group exercise program is designed to improve strength, balance and gait, and includes education sessions about home safety, home exercises and safe medication practices.

**Geriatric Outreach Team** Assessing homebound seniors in their homes who have complex problems related to health, day-to-day functioning and social concerns.

**Geriatric Out-patient Clinic** Working in collaboration with the patient's primary care physician and/or primary care providers, this clinic offers a consultative assessment provided by a geriatrician and supported by interprofessional team members.

**Interprofessional Consult Team** Composed of a geriatrician, registered nurse, physiotherapist and social worker, this internal consult team conducts a comprehensive assessment and provides recommendations on older in-patients who have complex medical and functional issues.

**Geriatric Emergency Management** Pioneering the role at Sunnybrook in 1995, geriatric nurse clinicians collaborate with the emergency department team to assess frail, at-risk seniors and link them to appropriate resources and specialized geriatric services at Sunnybrook or in the community.

PHOTOGRAPH BY TIM FRASER

well as a reduced length of stay.

Keeping patients moving is especially important considering up to one-third of older patients experience a decline in their function as a result of being immobile during their hospital stay.

"Patients can lose 5 per cent of their muscle strength per day of bed rest, so the early mobilization strategy is critical, whether it's a simple exercise or walking. It gets patients moving three times a day," says Jocelyn Denomme, a physiotherapist and mobility lead for the Senior Friendly Strategy at Sunnybrook.

One of the keys to mobilizing elderly patients at Sunnybrook was the introduction of Healthy Stay Volunteers five years ago. Young people accompany patients on walks and help them navigate the hospital's often busy corridors or help elderly patients stay oriented by paying friendly visits. What started out as a small program of about 40 to 50 people has grown into a major network of more than 600 volunteers.

Sunnybrook is also the co-lead site for Mobilization of Vulnerable Elders in Ontario (MOVE ON). The program promotes early and consistent mobilization of hospital patients throughout their hospital stay. MOVE ON grew from a joint initiative of Sunnybrook and St. Michael's Hospital, to a 14-site provincial collaboration funded by the Council of Academic Hospitals of Ontario (CAHO). It has now reached beyond these 14 hospitals to include over 40 hospitals in Ontario.

Outside the hospital, Sunnybrook has formed partnerships with Emergency Medical Services (EMS) services in Toronto, and Halton and Peel regions to have hospital clinicians shadow paramedics during their calls in the community.

"This is a collaborative effort, to determine how we can better understand the person and how they were functioning prior to hospitalization, which is essential information for



care providers," says Beth O'Leary, program manager, Senior Friendly Strategy & Best Practice Implementation. "This helps to guide the delivery of appropriate care and best practice."

Dr. Liu says one of the keys to changing how health-care professionals deliver care to an aging population is changing our language and attitudes. "Ageism is one of the last accepted forms of discrimination, but I'm hopeful this will change because of the progress in other domains for example, how we talk about and view mental health and disability," she says. "Hopefully, society will catch up on this issue, too."

Looking after the health-care needs of seniors is a complex process with many challenges. Through innovative best practices, knowledge sharing and a return to some basic care approaches, Sunnybrook is helping to make an aging population's golden years live up to their promise. 📌

Nurse Practitioner Deborah Brown discusses *Keeping a Healthy Mind* with a patient, part of the Anti-psychotic Stewardship Program.



## Growing old gracefully

Veterans have fought in war, now they are facing new battles of deteriorating health and dementia.

That's where Sunnybrook's Veterans Centre plays an important role. Nestled on the hospital's leafy grounds, it is the largest veterans' care facility in Canada. Working in partnership with Veterans Affairs Canada, the Veterans Centre provides long-term care to 475 veterans from

the Second World War and Korea.

Opened in 1948 by Prime Minister William Lyon Mackenzie King, Sunnybrook was originally founded as a hospital for war veterans, a place for the courageous men and women who served our country to heal and readjust to life at home.

Sunnybrook pioneered new procedures in the diagnosis of musculoskeletal problems, spinal cord injuries, cardiovascular conditions, plastic surgery and rehabilitation medicine for soldiers returning home with devastating injuries.

Today, residents live as independently as possible in the

Kilgour wing, George Hees wing and the Dorothy Macham Home. Care is divided into four main categories: physical support, cognitive support, mental health support and palliative care (for veterans, as well as community patients). With the generous support of Veterans Affairs Canada, myriad unique recreation, music and art therapy programs and outings are an integral part of daily life and are designed to maximize quality of life for the residents.

Along with specialized cognitive support care units, the Dorothy Macham Home provides a therapeutic, home-like setting for

10 veteran residents who have aggressive behaviours related to dementia, and sometimes complicated by posttraumatic stress disorder. The unique design of the home was the result of extensive consultation with both national and international experts in dementia care.

Sunnybrook is committed to the welfare of Canada's war veterans. If you would like more information about the Veterans Centre, visit [www.sunnybrook.ca/veterans](http://www.sunnybrook.ca/veterans). For eligibility and admission inquiries, please contact Veterans Affairs Canada directly at 1-866-522-2122.

PHOTOGRAPH BY DOUG NICHOLSON

# Raise a flag for Canada's heroes

Commemorate Remembrance Day this year by supporting Canada's heroic veterans at Sunnybrook. With your donation of \$25, we will plant a flag in front of our veterans' residence. Last year, we raised over 30,000 flags.

Your support will help provide our veterans with community outings, continued learning opportunities and special time with family members.

Visit [raiseaflag.ca](http://raiseaflag.ca) to learn how you can honour our heroes.



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# Patients as teachers

Former patients play a crucial role at Sunnybrook by returning to the campus to help foster a constant climate of improvement

By Alexis Dobranowski

Ruth Milkin chats with medical student Ali Damji after a morning in the simulation centre.

**B**y involving patients and families in the unique aspects of a teaching and research hospital – from undergraduate education to clinical research to patient care – Sunnybrook hopes to gain powerful insight to improve the patient experience.

Patients have been added to advisory committees, given feedback to trainees, developed research materials and provided input on food choices, uniforms and more. Continually reaching out to patients, family members and visitors allows Sunnybrook to keep a pulse on what matters most to them.

## Patients, real and simulated

Students learn on mannequins and in mock scenarios at the Sunnybrook Canadian Simulation Centre, practising their skills in a safe and non-threatening environment. A first-of-its-kind initiative is now bringing a real patient into the mix to help train third-year medical students on their anaesthesia rotation.

As part of the Choosing Wisely Canada campaign, instructors at Sunnybrook are teaching medical students to engage patients in conversations about tests, treatments and procedures, and to think critically about whether these measures are necessary.

In a simulated scenario held in the centre, students assess a standardized patient – a trained and scripted actor – during a mock hospital visit three weeks before surgery. A real patient, who volunteers to act as a family member attending the appointment, is by the standardized patient's side.

"The students do a patient history and then make a plan for further evaluation: 'Does the patient need cardiology exams or radiology or blood work?' They then come back to the patient and family member to share the plan with them," says Dr. Thiago Appoloni Moreira, who was integral to implementing the patient volunteer program during his two-year fellowship at Sunnybrook.

"This is where the real patient starts to interact. She challenges the students about their plan: 'Why didn't you order a chest X-ray on my brother?' or 'Why did you order the chest X-ray? My brother is healthy!'"

The students must articulate why they made the choices they did when challenged in the simulated scenario. For example: why the chest X-ray wouldn't be done for this patient.

"They have a conversation about this and explain to the family, in layperson terms, why it isn't necessary," Dr. Moreira says.

The first patient volunteer, Ruth Milkin, says she's been delighted to take part in this new initiative. She volunteers once a month in the centre, and so far she has met with nearly 120 students.

"Students at this point in their medical school education haven't had much interaction with patients," she says.

Medical student Sina Rusta-Sallehy agrees. "There's so much medicine to learn and remember. This session was a very good reminder that you're treating a person, not an illness," he says.

He says he left the simulation centre with some lasting lessons: the importance of eye contact and taking a moment to listen and genuinely connect with each patient.

Ruth had two surgeries at Sunnybrook recently, and she also spends time talking to the students about her experience as a patient. There's so much anxiety that comes with being a patient," Ruth says. "I remind the students to take a moment to reassure the patient and answer questions. When a patient comes in with a family member to act as a second set of ears, include that family member in the conversation."

Communication is more than an exchange of words, she says, adding that she reminds students also to be mindful of body language and other non-verbal cues.

According to Dr. Moreira, having a real patient in the simulation centre brings it to life. "We have to deal with difficult people and communicate in real life, but it's training our students may not otherwise have until they get into the real clinic room," he says.

"Ruth has no script. She talks to them, shares how she feels, explains what it's like to be a patient trying to communicate with a doctor. She brings an emotional side that will help the students retain what they need to learn. She expresses how she felt in those moments. It's a very important tool."

Medical student Ali Damji says he hopes having patients involved in training becomes a standard: "Some of the most fantastic teachers are our patients."

## Designed by families, for families

Dr. Anthony Levitt knew he had a problem when he was chief of psychiatry at Sunnybrook.

"During a three-week period, three families separately came to me to provide feedback and express some frustration regarding their family member's care as a mental health in-patient," he says. "I thought, 'OK. We need an in-patient navigator.'"

But he took a critical pause before he set out to make that happen: He decided to ask families what they want. "We held two focus groups, and the results were not what we expected," says Dr. Levitt, now chief of the Hurvitz Brain Sciences Program. "Yes, parents told us in-patient care is complicated. But it's the whole system that is confusing and hard to navigate."

And so, with direct input from these families, Sunnybrook's Family Navigation Project was born. It's a non-profit program designed to provide expert navigation of the mental health



and addictions service system for young people aged 13 to 26 with serious mental health and/or addictions problems and their families. The project, conceived by families, designed by families and driven by families, continues to engage family members as a core value.

Ingrid Lane has been a member of the project's Family Advisory Council since its inception. Like all of the members, Lane has first-hand, or lived, experience navigating the mental health-care system for her children.

"My husband and I spent many years knocking on the wrong doors to find help for our children," she says. "Those were dark and disturbing days for our family. Through the Family Navigation Project, we can help other families knock on the right doors. And we can help them walk through the doors, ready with the right language and the right questions."

Family involvement in mental health is so important because it's a family issue, Lane says. "When one person is unwell, the whole family is unwell."

Jeanne Foot agrees. She's the chair and a founding member of the Family Navigation Project and sits on the Family Advisory Council. "Combining clinical expertise and lived experience has the best results," she says. The advisory council assists in hiring staff, provides program feedback and gives a quick pulse on all decisions with respect to the project. "We are a voice in the system, and it's working. The work is applauded because it's shifting the system."

Not including patients and families in conversations about the health-care system is a costly mistake, she says.

In addition to the Family Advisory Council, the Family Navigation Project gets feedback from parents and patients, both informally and through satisfaction surveys. "The families we serve are constantly updating us, and we tailor our program to their needs," Foot says. "And our program doesn't change without debate, input, discussions and spontaneous

ideas from our Family Advisory Council. It's built into our culture now."

While the program may continue to change and grow, one thing is certain, Lane says: "We know that the voice of the parents will always be an integral part of the program."

Listening to lived experience at every part of the health-care sector is crucial, Foot adds. "It's so important to understand the needs of the family and know we are better when we are all working together," she says.

Dr. Levitt says many health-care professionals are not aware of the value of involving families and patients in system design. "If you invest the time in involving families, the returns are immense," he says. "We couldn't have conceived, or implemented, the Family Navigation Project without parents with lived experience." ■

Dr. Anthony Levitt (below left) says patient and family involvement is key in designing health-care provision.



## A watching brief

Studies have shown that as many as 87 per cent and as few as 30 per cent of North American health-care workers regularly wash their hands. Yet, hand hygiene is known to be the best way to keep people healthy while they're in the hospital because it reduces the spread of bacteria and organisms. It's so important, in fact, that Sunnybrook has hand hygiene

observers who go from unit to unit, evaluating whether staff members are remembering to clean their hands.

This observation approach works for most areas of the hospital, but not all. "Having a hand hygiene observer sit in on an appointment in Family Practice could be uncomfortable for the patient. We could be talking about sensitive information or doing an exam, and they might not want another person in the room," says Dr. Jeremy Rezmovitz, staff physician in Family Practice at Sunnybrook. "So we thought, 'Why not have the patient

take on the observer role?'"

This idea developed into Patient as Observer, a unique initiative that engages patients in their own care. When patients arrive at Family Practice, they're handed a form and asked to observe their health-care provider's hand-washing performance. Patients are asked to focus on evaluating each of the four "moments" of hand hygiene: before any contact with a patient, before a procedure, after a procedure and after any contact with a patient.

So far, Family Practice has done

three one-week blitzes, collecting 200 patient observation forms each time. The results have been encouraging, with the unit's hand hygiene compliance rates consistently coming in above average. "Our patients enjoy being engaged. They like being a part of something bigger," says Dr. Rezmovitz.

The Patient as Observer program has already spread to other areas of the hospital, including the Odette Cancer Centre, and expansion into other program areas is on the horizon.

PHOTOGRAPH BY DOUG NICHOLSON



Breast cancer survivor Sonia Rocco, pictured with daughter Genna, benefited from the counselling and guidance of PYNK program practitioners.

# Hope and possibility

Young women with breast cancer face medical and psychological challenges that can be very different to those of their older peers. That's why Sunnybrook launched the PYNK program

By Judith Gerstel

PHOTOGRAPH BY TIM FRASER

**S**onia Rocco was 35 when she gave birth to her first child, a healthy baby girl named Genna.

Twenty months later, Sonia was diagnosed with breast cancer.

"I found the lump while I was breastfeeding," says Sonia, "but I didn't think it was anything."

She knew that it was normal for breast tissue to change with pregnancy and breastfeeding.

She also knew there was no history of breast cancer in her family, nothing to suggest that she might be one of the thousand or so Canadian women under the age of 40 who are diagnosed with breast cancer every year.

When the lump didn't go away after a couple of weeks, Sonia went to her family doctor.

Her mammogram was worrisome enough for a referral to Sunnybrook's rapid diagnostic clinic.

"I had the mammogram, the biopsy and the diagnosis within 24 hours," she recalls.

"I kind of knew as soon as they did the biopsy on my breast and under my arm. My husband was a lot more overwhelmed than I was when we got the results," says Sonia.

"But later, when I got home and I was with my 20-month old calling me mommy, I was completely overwhelmed. There were a lot of very scary moments: 'What is happening to me? What's the prognosis?' All the uncertainty."

But there was also the Young Women With Breast Cancer Program (PYNK), Sunnybrook's support and research program for young breast cancer patients.

Because Sonia was under 40, she immediately qualified for the special care provided by PYNK.

It's a fact that women diagnosed with breast cancer at a young age have lower survival rates and experience poorer quality of life than women diagnosed when they are older. They experience more physical side effects, depression and fear of the cancer returning.

They often sense that they may be facing mortality early, leading to the worst fear of all for any young parent – not being there to see their children grow up. And if they survive, they'll be dealing with possible premature menopause and infertility related to treatment.

"We're taking away their hormones and destroying their libido," says Dr. Ellen Warner, referring to some of the lesser known side effects of cancer treatment. She had these concerns in mind when she initiated PYNK, a groundbreaking team effort to deal with the complicated issues, including infertility, of young women diagnosed with breast cancer.

"We have a nurse navigator," she says. "Our women are getting extra nursing care, but a lot of it is also psychological."

She cites an example: "We had one young woman who was newly married. Sex became very painful and she would bleed. She was dealing with physical symptoms and psychological stress."

The young patient, sent into early menopause by the cancer treatment, was experiencing vaginal dryness. Fortunately, there was a simple solution, says Dr. Warner. "She wasn't using lubricants properly. We also have a counselling program online for these young couples."

PYNK patients range in age from 17 to 40 years old, with an average age of 35. However, the average woman who gets breast cancer is 61, notes Dr. Warner. For those older women, a breast cancer diagnosis brings with it many questions and concerns.

"But for a younger woman, the questions and concerns can be different. Maybe she's 30 and single, and she's thinking, 'Oh my God. I'm going to lose a breast, never get married, go into menopause, never have a baby.' Or maybe she has young children, a big mortgage, has to quit work and hire babysitters for appointment and treatment days. Maybe she wanted to have another child."

The critical issue for a high percentage of these young women – after survival – is fertility. Endocrinologist and infertility specialist Dr. Karen Glass has been part of Dr. Warner's PYNK team from the beginning, harvesting eggs before chemotherapy, offering in vitro fertilization (IVF) and freezing the fertilized or unfertilized eggs for later implantation.

"For young women with cancer," says Dr. Glass, "it's now the completely normal, expected thing to do."

Research has always been a major focus of



Dr. Karen Glass advises PYNK program patients of their fertility options, such as freezing eggs, before they go through chemotherapy.

PYNK. Studies have looked at the uptake of genetic testing among women born outside Canada, what percentage of women wanted prophylactic mastectomies and the relationship between young patients with breast cancer and their mothers.

Sunnybrook's successful PYNK program is the prototype for a new Canada-wide research project called RUBY (Reducing the Burden of Breast Cancer in Young Women).

Co-sponsored by the Canadian Breast Cancer Foundation and Canadian Institute for Health Research, the four-year study will enroll 1,200 women newly diagnosed with breast cancer at age 40 or younger – including PYNK participants – at 29 sites across Canada.

RUBY will build on the PYNK research model developed at Sunnybrook, collecting blood and tumour samples in addition to detailed clinical data and patient-reported outcomes, which are kept in a special PYNK database. The data collected will include detailed information about their family history and other risk factors, treatment, disease outcome and quality of life.

"Some of it is hereditary," says Dr. Warner, "but we don't really know what causes it (at a young age). It's all part of the research challenge." She calls RUBY a "PYNK copycat" on a larger scale.

RUBY encompasses several substudies, including genetic testing for abnormalities that may have caused the cancer, and determining the effect of lifestyle factors on breast cancer recurrence.

Dr. Warner and Dr. Glass are guiding research within RUBY that is intended to encourage referrals of young women with breast cancer

PHOTOGRAPH BY DOUG NICHOLSON

## THE MAMMOGRAM GOES 3-D

Looking at a regular mammogram, explains Dr. Martin Yaffe, senior scientist at Sunnybrook Research Institute, is a lot like looking through the glass at an aquarium. "You don't see the little fish behind the others."

That incomplete view is challenging when the patient is a younger woman who typically has more dense tissue and less fat in her breasts, meaning small cancers may lurk unseen.

Dr. Yaffe and his Sunnybrook colleague Dr. Roberta Jong, a radiologist specializing in breast imaging, are Canadian pioneers in advancing new techniques and technology for mammograms for younger women and those with dense breasts.

They led the Canadian contribution to the landmark study – D-MIST (Digital Mammographic Imaging Screening Trial) – that compared the diagnostic accuracy of film and digital mammography.

They found that, for women 50 years old or younger and for women with dense breasts, the digital mammography was significantly more accurate. Digital mammography has now all but replaced film mammography.

Now Dr. Yaffe and Dr. Jong are again advancing the field, leading the first Canadian clinical trial comparing three-dimensional breast

by breast surgeons to fertility specialists who specialize in this patient population. They are also working on a study to better predict the effects of cancer treatment on fertility.

"Ultimately, we're hoping that the research will come up with better treatment, that recurrence rates will drop, and that quality of life will be better for young women with breast cancer," says Dr. Warner.

While Dr. Warner's and Dr. Glass's research is helping create a better future for young women with breast cancer, there's much joy every time a young breast cancer survivor is able to bring new life into the world because of the PYNK program.

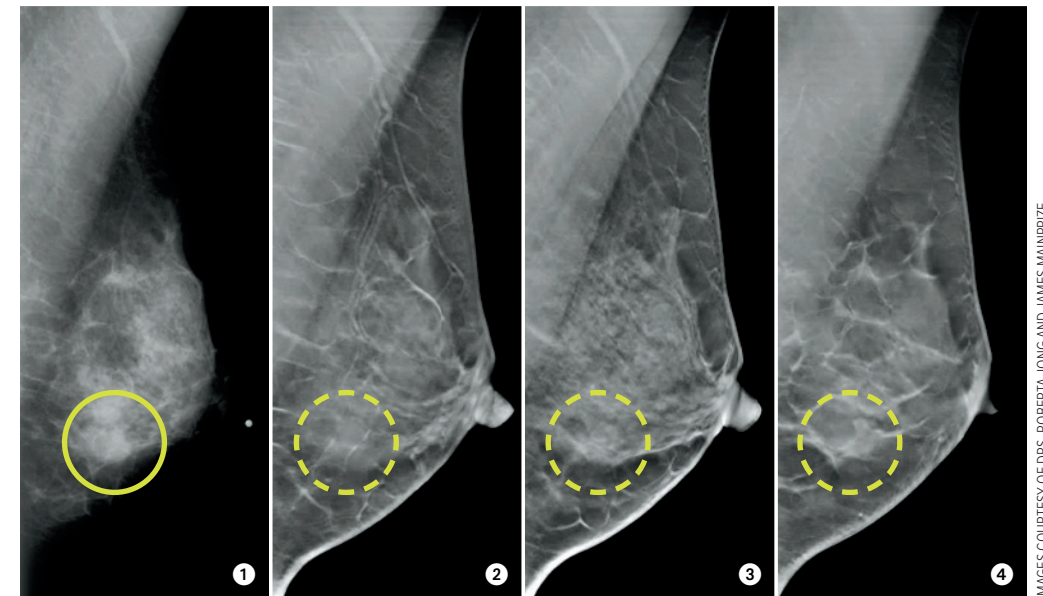
"I just found out today that another PYNK graduate is pregnant," Dr. Glass says, with a

touch of pride.

Five years after her lumpectomy, radiation and chemotherapy, Sonia is now celebrating another milestone; she gave birth to her second daughter, Gia, in July, making her six-year-old Genna a big sister.

"Dr. Glass is incredible," Sonia says. "One of the first conversations I had after the diagnosis was, 'Do you want to extend your family?' She took me through the procedure and was with me every step. It was a comforting experience, how she and Dr. Warner worked together.

"My husband and I decided to freeze embryos. And last winter, we decided, let's give it a shot. And it took. And everything is going great," she says. "Having a second child was a hope. A hope of a possibility." ■



IMAGES COURTESY OF DRs. ROBERTA JONG AND JAMES MAINPRIZE

imaging (3-D tomosynthesis, or TMS) with the current standard of digital mammography.

T-MIST (Tomosynthesis Mammographic Imaging Screening Trial), initiated at Sunnybrook, will be the first, large randomized, multicentre study comparing the two techniques.

Dr. Yaffe describes the newer technique as "looking slice by slice." Instead of taking just two digital views of the breast, TMS takes up to 15 images that are layered into a three-dimensional view. "It's less likely that structures would be hidden," explains Dr. Yaffe.

The 3-D view not only finds more abnormalities, but it also reduces the number of false alarms.

Preliminary studies suggest that TMS reduces the chances of false alarms by about 30 per cent.

When TMS finds cancers that may otherwise not have been recognized until later, it can result in less aggressive treatment, meaning breast conservation and increased survival rates, he says.

Or, as is often the case with prostate cancer, testing a tiny malignant tumour found in the breast may indicate that it poses no risk and requires only "watchful waiting."

The researchers are currently recruiting more than 6,000 women at four sites in Canada for T-MIST, while looking to extend the trial to 148,000 women across 14 more sites in North America.

Tomosynthesis can reduce the number of "false alarms" from breast cancer screening. In panel 1 is a mammogram of 45 year-old female. A suspicious area is outlined above. By viewing the tomosynthesis slices (panels 2 to 4) the radiologist can be assured that there is no cancer present, but only normal tissue structure at that location.

# Keep learning and carry on

Advanced education is helping nurses expand their horizons – and mentor the colleagues who follow in their footsteps

By Marlene Habib



It was a stressful situation for a new nurse in Sunnybrook's Neonatal Intensive Care Unit (NICU): A father, upset over a change in the care plan for his premature baby, was becoming increasingly emotional and the nurse – who had been on the job for about six months – was struggling over how to handle the situation.

Enter registered nurse Jo-Ann Alfred, a nurse educator whose advanced education and clinical training gave her the tools she needed to calm the nurse down and help her deal with a potentially confrontational situation.

"The father was emotional, and at the time the nurse wasn't sure how to properly explain the change in the plan without getting the father more upset," says Alfred, an 18-year veteran nurse who has been working in the NICU since 2014. "I told her the biggest thing to do in this situation is to use kindness and understanding, and listen, because [for the most part] they just want to be heard."

The work of Alfred and other nursing mentors is part of Sunnybrook's emphasis on continuing education, which is proving to be more important as health-care workers adapt to new challenges of increasingly complex hospital settings, an aging population, complex medical conditions and technological advances such as

mobile devices and electronic medical records. "This is about ensuring that we are providing the best care we can for patients and families in a constantly evolving world," says Elizabeth McLaney, Sunnybrook's director of Interprofessional Education. "And at the same time, ensuring we can continue to provide that care for future generations."

In the nursing education department, improving the patient experience comes in many forms – but it all starts with making sure newly hired nurses are comfortable and confident in their roles. Critical to this is mentoring. Following an orientation period, each new nurse is teamed with an experienced colleague, says Beverly Waite, a nursing education leader at Sunnybrook.

As well as benefiting from mentoring initiatives, many of Sunnybrook's registered nurses pursue a master's degree and even a PhD, qualifying them for advanced-practice nursing positions (such as nurse practitioner and clinical nurse specialist) and other clinical roles, as well as research, teaching and leadership positions.

So who are these Sunnybrook nurses embracing the never-stop-learning culture? Here are just a few:

"I really enjoy nursing education and being that support system: helping new nurses and nursing students develop skills and confidence."

Lauren Cosolo  
(above)

PHOTOGRAPHS BY DOUG NICHOLSON

"A lot of people entering the profession don't realize that you can have a rich career that advances patient care from more than one vantage."

Craig Dale  
(below)

## Lauren Cosolo

Part-time registered nurse (RN) in the trauma unit and clinical instructor for University of Toronto (U of T) nursing students

Lauren Cosolo knows through her own experience the value of having a mentor.

"When starting out as a new nurse, you're not confident in yourself or your skills, but having somebody there to help you through that is so valuable," says Cosolo, 27. "In the trauma unit, we get people who've been seriously hurt from motor vehicle collisions to gunshots and have traumatic brain injuries – they're complex traumas that involve lots of different systems."

For the past couple of years, while working part time in the unit, Cosolo has pursued a master's degree in nursing. By doing so she hopes to become a nurse educator, to teach other nurses in "evidence-based practice" – that is, caring for patients using the best knowledge possible, based on both scientific findings and what has been shown to work in practice.

When patients arrive in the trauma unit, she says, "usually they're from the Intensive Care Unit (ICU) and they're acutely ill. A newly hired nurse in the ICU may struggle at first with addressing the concerns and fears of distraught families of these patients. But the

mentor helps by giving valuable advice and recommending resources to help the new nurse deal with the needs of the patients' loved ones."

Under the early guidance of her mentor Melanie Santos at Sunnybrook, Cosolo learned to hone her nursing skills. "Melanie was very much the one who would give me confidence. She was always there for support when I needed her, but also pushed me to be independent, which is important," Cosolo says.

After taking a nurse preceptor workshop (which educates nurses on how to guide and work with students), Cosolo mentored her first student last year and takes pride in seeing her now working in the trauma unit.

"I really enjoy nursing education and being that support system: helping new nurses and nursing students develop skills and confidence, handle a full patient load and practise confidently, ethically and safely," Cosolo adds.

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## Craig Dale

Advanced-practice nurse (APN) in the ICU and assistant professor at the Lawrence S. Bloomberg Faculty of Nursing at U of T

Craig Dale has seen his career as a nurse go through quite an evolution over his 22-year tenure at Sunnybrook; through it all, he's constantly reminded of the importance of learning from the patient experience.

Dale, 51, has been an APN in the ICU for the past decade, with specialties in qualitative health research and critical-care nursing. He has been an assistant professor at the University of Toronto since January 2015, two years after earning his PhD in nursing.

"One thing I didn't realize at the start of my career," he says, "is, you can become a scientist at the same time as being a nurse clinician. A lot of people entering the profession don't realize that you can have a rich career that advances patient care from more than one vantage. In my case, I've done this through my clinical role, my academic work, my research and as a mentor to other nurses at Sunnybrook."

Dale's research focuses on improving hygiene practices for intubated and mechanically ventilated adult patients. For his doctorate, he studied the practical challenges of providing oral care and how to improve it. It's an essential life-saving skill; for instance, he discovered that pneumonia starts with bacteria in the mouth.

He believes nurses play a crucial role in the health-care system internationally, including in leadership positions, "because they understand what's happening at the point of care:



they know how things work and how they break down. They've also been trained to communicate with people in distress which is one of the most important skills clinicians can bring to the patient-family encounter."

One young trauma patient, who suffered extensive orthopaedic and facial fractures in addition to a life-threatening pneumonia, was particularly memorable for Dale.

"He couldn't speak while on the ventilator and his eyes wouldn't open because of his facial swelling," he says. "Assuming he was able to hear and understand me, I guided him during his care and offered encouraging details about his recovery. Many months later he walked into the ICU to thank me. He didn't know what I looked like but said he could recognize my voice.

"Despite the high-tech focus of ICU life-support, I have learned how patient survival is undeniably conditioned by empathetic support and communication."

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#### **Desiree and Drew Lewis**

*Staff RNs, Neonatal Intensive Care Unit (NICU)*

Born several weeks early, it seemed fraternal twins Desiree and Drew Lewis's destiny that they would end up working with other premature babies. They have been doing just that in Sunnybrook's NICU since September 2015.

The sisters, who turned 26 in May, say their experiences in the NICU after getting nursing degrees have been "amazing," in large part because they weren't just thrown into the nursing pool to sink or swim.

Drew, the older twin by five minutes, always wanted to be a nurse. Desiree earned an accounting diploma before realizing she, too, would rather work in health care.

After graduating last year, they joined the NICU staff and entered an orientation program with in-class learning for two weeks, then received one-on-one training by nurse preceptors over a three-month period.

Their own background as premature twins helps fire their enthusiasm for their work in the NICU. "I am inspired by [preterm babies'] strength, resilience and fight, and by how strong and hopeful their families are," says Desiree, who says these young patients motivate her every day to want to learn as much as possible about her profession.

"I am lucky that I can come to work every day and feel inspired by all those around me," she says, adding she wants to further her education and inspire future nurses "the way I was inspired by many throughout my journey."

Desiree says she and her sister continually



experience what it means to be part of a teaching hospital. They're grateful they can collaborate with other nurses, doctors, pharmacists, dietitians, social workers and other professionals who are passionate about their jobs and enthused to teach and "clarify their piece of the patient puzzle," while trying to return that to their colleagues at Sunnybrook.

Although she's not certain what her career future holds, Drew says she, too, will one day pursue additional education, and her experience at Sunnybrook will prepare her. "I will be ready for the journey." 📌

"I am lucky that I can come to work every day and feel inspired by all those around me."

Desiree Lewis  
(above right, with twin sister Drew)

PHOTOGRAPH BY DOUG NICHOLSON

"Imagine if Joseph could see this now."

William Kilgour, Joseph's great-nephew



Sunnybrook began with a gift of land from the estate of Joseph Kilgour by his widow Alice. Over 85 years later, his great-nephew mused, "Imagine if Joseph could see this now." Joseph would see that his gift all those years ago is why Sunnybrook can invent the future of health care today.

Sunnybrook Kilgour Society members are visionary people like Joseph and Alice Kilgour, who have included Sunnybrook in their estate plans. We welcome you to be part of this group.

SUNNYBROOK  
KILGOUR SOCIETY

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BREASTFEEDING

# Lean on me

Peer counselling at Sunnybrook's NICU improves breastfeeding rates and outcomes for premature babies

BY CATALINA MARGULIS

**A**lexis Danford was only 25 weeks pregnant when she went into labour. Born at Sunnybrook almost 15 weeks early and weighing less than two pounds, her daughter Reylene faced a range of serious health problems, including life-threatening breathing, heart, brain and eye issues. Fortunately for the new mom and baby, the Neonatal Intensive Care Unit (NICU) at Sunnybrook's Women & Babies Program was running an initiative that brings in breastfeeding peer counsellors to help and encourage families like hers. Breast milk is especially critical in the care of premature infants, as it promotes healing,

**Above:** Alexis Danford with healthy, happy Reylene, who was born at the NICU 15 weeks early.

growth and development and decreases the risk of life-threatening infections and conditions. Yet, mothers of pre-term and critically ill infants face unique barriers and challenges to breast-feeding.

The NICU Peer Counsellor Program aims to increase the percentage of premature infants who are exclusively breastfed on the day of discharge. The program is part of a study through Sunnybrook's Breastfeeding Centre of Excellence: it opened last year as the first of its kind in Canada. The program's goal is to promote the exclusivity and duration of breastfeeding for all

infants, with a particular focus on "micro-premature" (born before 26 weeks) infants. The study found that bringing peer counsellors – moms who are themselves graduates of the NICU – into the unit increases breastfeeding rates in new moms who are having trouble breastfeeding.

"Having a peer counsellor to help support me with my breastfeeding experience was integral to achieving my feeding goals," says Alexis, 25. "I had to pump every two hours for the first three months of Rey's life. I was getting my supply up for when we were ready to start trying at the breast. During this time I was often exhausted and sometimes felt overwhelmed, but my counsellor would make a point to recognize my efforts and motivated me to keep going. I'm grateful to have had such strong support.

"Three days after my daughter was born, still in shock and terrified, I met Ophelia Kwakye in Sunnybrook's NICU Family Room. She introduced herself to me immediately and invited

me to join her and the rest of the NICU moms for the weekly Mom Lunch," adds Alexis, a freelance multimedia producer from Barrie, Ont. "From that day forward, she made every effort to encourage, support and help me in any way possible. She was someone who truly understood what we were going through and assured us that there was a beautiful and joyful end in sight."

Kwakye gave birth to her own son 15 weeks early. He stayed at Sunnybrook for almost four months, battling infections and pneumonia, and requiring three blood transfusions. Kwakye credits NICU Parent Support Specialist Kate Robson with getting her through the trying time.

It was Robson who later approached Kwakye to see if she would be interested in becoming a peer counsellor herself. It's a part-time job for Kwakye, who now spends her days working with moms in the NICU.

"I go in the unit, room to room, and talk to moms about how to pump every two to three hours and how to maintain your milk supply," says Kwakye. "I also encourage them about what happens around here and how to take care of themselves. I ask them about what they're doing and share how they can do better."

When it comes to preterm babies, and micropremies especially, breastfeeding is truly life-saving, says Jo Watson, chair of the Breastfeeding Centre of Excellence and operations director of the Women & Babies Program. Breast milk promotes healing, growth and development, and decreases the risk of life-threatening necrotizing enterocolitis (a condition that affects the intestines), infections and time spent in hospital. It also improves motor outcomes, cognitive skills and neurobehavioural development.

"When a baby is born premature, the composition of the milk actually changes from the characteristics that a full-term baby would receive," says Watson. "It's



**Above:** Former NICU mom Ophelia Kwakye is now a peer counsellor, advising new mothers on breastfeeding their preemies.

higher in fat, because what that baby needs is a higher fat content to support the final growth of the brain that would have happened in the uterus. Breastfeeding also reduces the risk of sudden infant death syndrome, and premature babies are at higher risk for it."

Watson developed the program after seeing similar initiatives elsewhere with successful outcomes. "The opportunity came up to apply for funding through the Government of Ontario and the support of the Best Start Resource Centre at Health Nexus to have an improvement project specifically focused on supporting breastfeeding in populations that had lower breastfeeding rates," explains Watson. "I knew this model had worked in other centres, so we thought that we would introduce peer counsellors into the NICU and see if we could improve breastfeeding outcomes."

Mothers of complex or critically ill pre-term infants encounter

a variety of unique breastfeeding barriers and challenges that can make it difficult to initiate and sustain breastfeeding. Many have to pump their milk up to 10 times a day for many weeks before the baby can be at the breast, Watson says. "Not only are you pumping around the clock, but you also have a sick baby in an intensive care unit. A lot of women have to travel a long way to get here and get home. They may have other kids at home. There are all kinds of challenges. It's hard to maintain that routine for weeks and weeks," she says.

According to Watson, the national average for babies receiving only breast milk on the day of discharge from an NICU is 40 per cent. "Our rate was already at 70 per cent, so we were doing really well in comparison with the rest of the country, but we thought we could do better, and we knew there were still opportunities," she says.

While rates for breastfeeding exclusivity at Sunnybrook for 2013 indicated that preterm infants are less likely to be exclusively breastfed at discharge than their full-term counterparts (68.3 and 76 per cent, respectively), thanks to the peer counselling program at Sunnybrook, that rate has increased to 75 per cent.

"I fiercely believe that Ophelia was an integral part of not just surviving the NICU, but [also] flourishing in it," says Alexis. "The empathy, insight and information she was able to provide as a graduate mother herself were intrinsic and incomparable."

Now almost five months old, Reylene is doing phenomenally well, says her mother – thanks, she adds, to Sunnybrook's Peer Counsellor Program and the centre's exemplary practices.

"Considering we had prepared for the worst, to now be home with a beautiful, healthy baby girl is both astonishing and humbling," says Alexis. "We truly are blessed and grateful for all that the entire amazing team in the Sunnybrook NICU did for our family." 🍀

PHOTOGRAPH BY TIM FRASER

PHOTOGRAPH BY DOUG NICHOLSON



TRAUMA

# On the leading edge of saving lives

*In its 40th year, the trauma program keeps on innovating*

BY DIANE PETERS

On a beautiful spring afternoon in 2010, Trent University student Steve Lanys-Morris left his rural home and drove into Peterborough, Ont., to pick up a pal for a night of beer and wings. In response to a text, Steve picked up his phone and typed “I’m on my w-”.

He never completed the word. A car ahead of him had stopped to turn left. Steve swerved into oncoming traffic, colliding head-on with another vehicle.

Paramedics concluded the 28-year-old had suffered a severe brain injury, and that one of his thighbones was broken in two places. With his life on the line, Steve was airlifted to Sunnybrook’s Tory Regional Trauma Centre.

The trauma centre, now cele-

**Above:** “We realize the importance of improving the quality of life of our trauma survivors,” says Dr. Avery Nathens, shown with Sharon Ramagnano (right) and Joanne Banfield (left).

brating its 40th anniversary, was Canada’s first regional trauma centre and it remains the country’s largest. The centre’s expert team cares for over 1,600 injured patients annually, many of whom are at risk of losing life or limb, usually from a motor vehicle collision, shooting, stabbing, severe fall or industrial incident.

While patients with injuries like Steve’s are a rarity at many hospitals, they’re a daily reality at Sunnybrook. Tory Regional Trauma Centre’s success at saving lives place it amongst the top 10 per cent of all North American trauma centres, according to a recent report by the American College of Surgeons.

Sunnybrook’s trauma team saves 94 per cent of the most severely injured patients who

come through the centre’s doors. They can do so because they harness the latest advancements in trauma care, some of which have been spurred by their own cutting-edge research.

This state-of-the-art care was there for Steve when it mattered most. Comatose and bleeding, he was rushed to the trauma bay and treated by a multi-disciplinary team of surgeons, anesthesiologists, nurses, respiratory therapists, imaging specialists, blood bank technologists and others.

They stabilized him over the course of nearly three hours by getting the bleeding from his leg under control and treating his life-threatening brain swelling.

Steve had won the opening round of his long fight to return to his daily life. He went on to spend the next 52 days in the Intensive Care Unit. Next came in-patient rehab, and then more from home.

Steve is still living with the residual effects of his permanent brain injury, which has prevented him from pursuing his career path, but he feels fortunate to be alive. “The trauma centre saved my life. I owe so much to them,” he says.

## A HISTORY OF INNOVATION

The advent of computed tomography (CT) imaging – a technology that was crucial to Steve’s care – is one of the major ways trauma care has improved since the Tory Regional Trauma Centre opened four decades ago. CT imaging can visualize nearly all parts of the body, and it is particularly well-suited for rapid evaluation of brain injuries and internal bleeding. With the introduction of this technology, Sunnybrook developed protocols for its optimal use to assess injuries and come up with effective treatment strategies. A recent addition to the team – dedicated emergency and trauma radiologists who conduct CT imaging – is yet another Sunnybrook innovation.

Advancement in blood transfusion science is another area where trauma care has improved in recent decades, thanks in part to contributions by Sunnybrook. For instance, the hospital’s Massive Hemorrhage Protocol is a comprehensive, multidisciplinary protocol that has been used as a model for hospitals worldwide.

Developed by Dr. Jeannie Callum, Sunnybrook’s director of transfusion medicine and tissue banks, and Dr. Barto Nascimento, a trauma specialist, the protocol stipulates how and when blood products – for instance, red cells, platelets, plasma – should be transfused in cases of massive bleeding. It also speaks to the use of medications to stop bleeding, and advises on various factors that can impact bleeding such as maintaining normal body temperature, using blood warmers for all blood products and frequent tests of clotting factors.

Dr. Callum’s team reviews every resuscitation involving massive transfusion. Their goal is improving the protocol and saving lives, while carefully and efficiently using scarce blood products.

Many patients who survive the early hours and days of a trauma can die later because of a blood clot in the legs or lungs. This is because immediately after

trauma, the blood clotting system goes into high gear to stop injury-related bleeding. This process can also lead to abnormal blood clots. Sunnybrook’s Dr. Bill Geerts has led research to enhance prevention and treatment of such clots.

Dr. Geerts, director of the hospital’s Thromboembolism Program, leads a team that assesses every trauma patient for this risk, often prescribing low doses of clot-preventing drugs. His team has dramatically reduced deaths and is considered a world leader in this aspect of trauma care.

Sunnybrook’s chief of surgery, Dr. Avery Nathens, says the Tory Regional Trauma Centre’s innovative care wouldn’t be possible without its talented staff. “We’ve brought in the right people, all of whom are here because of their commitment to the injured patient,” he says.

Sharon Ramagnano is one of those people. She was brought on this year as manager of trauma services and will lead quality improvement and strategic project work in order to make processes better and foster more alignment across all clinical areas that are involved with trauma patient care. She is also focused on patient and family education to both prevent trauma and support those going through the continuum of trauma care.

We are very proud of the work we do saving lives,” says Dr. Nathens. “We also realize the importance of improving the quality of life of our trauma survivors. This focus – bringing together the experience of our surgical teams, rehabilitation medicine specialists and mental health physicians – to get patients back on their feet to the lives they’ve had before injury – will be our next advancement.”

An important innovation on the horizon is the construction of Sunnybrook’s first hybrid operating room (OR). At twice the size of a standard OR, the hybrid OR will bring advanced imaging and surgical equipment into the same room. This will, for instance,

enable one surgeon to operate to stop abdominal bleeding, while another surgeon operates on the brain.

“A hybrid OR means we will never have to compromise in our approach,” says Dr. Nathens, adding that the facility, which will be built with the assistance of donors, is evidence of Sunnybrook’s commitment to inventing the future of trauma care.

For trauma patients like Steve, it’s all quite remarkable. “There’s so much work that goes into saving one person,” he says. “I think it’s just amazing.”

## A P.A.R.T.Y. with a message

Steve Lanys-Morris cannot change the past and return to life before his crash. But he can try to prevent youth from taking unnecessary risks, including texting and driving – the fastest growing cause of traumatic injury in young people.

As a speaker with Sunnybrook’s Prevent Alcohol and Risk-Related Trauma in Youth (P.A.R.T.Y.) Program, Steve shares with students how risky behaviour can lead to life-changing injuries.

“Showing the consequences from risk-taking behaviour, like texting and driving, is what the P.A.R.T.Y. Program has been doing for the past 30 years,” says Joanne Banfield, manager of the RBC First Office for Injury Prevention at Sunnybrook, which runs a range of risk-reduction programs, including P.A.R.T.Y. “We know that when young people see the reality and impact of a traumatic injury, it inspires change in behaviour and attitude.”

P.A.R.T.Y. participants, usually students aged 15 years and older, come to Sunnybrook and visit the trauma bay, critical care unit and other key treatment facilities and hear from doctors, paramedics and police. They then hear from injury survivors, like Steve. “It’s reality-based, and it resonates with students,” says Banfield.

Giving back is also a key part of rehabilitation for Steve and other former trauma patients who may struggle to accept what can be lifelong injuries. It’s satisfying, Steve says, to help prevent incidents similar to his.

Studies that observed P.A.R.T.Y. participants over a 10-year period show they have a lower rate of injuries, collisions and driving offences, including drinking and driving, than young people who did not attend the program. Based on the success of P.A.R.T.Y., Sunnybrook has licensed the program to 150 centres in seven countries.

PHOTOGRAPH BY TIM FRASER



NEUROMODULATION

# Rewiring the brain

*By targeting the circuitry in the brain, Sunnybrook doctors hope to pioneer a new approach to mental health treatment*

BY SHANNON MONEO

**F**or 15 years, a Toronto woman endured severe depression, without getting relief from medication or other treatments.

With no end to this chronic condition in sight, she agreed to enroll in a clinical study of a new treatment known as deep brain stimulation (DBS), which delivers electrical stimulation to targeted areas in the brain and blocks abnormal nerve signals.

Within 10 months, the debilitating symptoms of depression became more manageable. One year later, the woman was well, says Dr. Anthony Levitt, chief of the Hurvitz Brain Sciences Program.

**Above:** Dr. Nir Lipsman, with a research participant for a clinical trial, testing the use of MRI-guided focused ultrasound for essential tremor.

One of a number of treatments that fall under the term neuromodulation, DBS is an example of the high-tech procedures that will become available within the Hurvitz Brain Sciences Program at Sunnybrook.

Neuromodulation is the process of altering the brain's circuitry by directly intervening inside the brain. Electrical, ultrasound or magnetic energy is used to change the brain's circuitry or disrupt pathways.

The field of neuromodulation is rapidly evolving, and Sunnybrook has been leading the charge. As part of the goal to deliver care that's tailored to the patient, Sun-

nybrook will house a Centre for Neuromodulation (CFN).

"Rather than a one-size-fits-all solution, we will provide individualized care," says Dr. Nir Lipsman, a neurosurgeon and scientist at Sunnybrook. "Our ability to offer the full range of neuromodulation strategies all in one place will make this program unique on a global scale."

Discoveries from neuromodulation techniques are opening up new treatment possibilities for people with conditions such as depression, obsessive compulsive disorder, schizophrenia and anorexia nervosa. "It's a whole new way of looking at mental health treatment," says Dr. Levitt, one of the lead physicians in charge of establishing the CFN.

"For the last 40 years, we've talked about mental illness as being a 'chemical imbalance.' That understanding has helped, but our treatments remain 50 to 60 per cent effective and relapse is unfortunately still too frequent," he says. There is renewed hope that understanding

mental illnesses as brain circuitry disorders will provide a quantum leap forward in treatment: if mental illnesses are circuitry disorders, then once the malfunctioning circuits are found, they can be adjusted.

Cutting-edge and minimally invasive techniques, such as DBS and high intensity-focused ultrasound (HIFU), will be used at the CFN to modulate dysfunctional circuits for conditions as varied as dementia, stroke, depression and anxiety.

The rising prevalence of neuropsychiatric disorders is driving the urgency to find new treatments for these conditions. The number of Canadians with dementia is expected to double from 747,000 in 2011 to 1.4 million by 2031, while major depression has already become the number one cause of chronic illness and lost productivity worldwide.

Neuromodulation, one response to the coming crush, has become one of the fastest-

growing areas in neuroscience and a new frontier for treatment of brain disorders.

Existing techniques, such as more invasive surgical procedures or electroconvulsive treatment (ECT), also adjust circuitry but lack precision and have side effects that are unacceptable to many patients. The use of HIFU, meanwhile, can much more precisely direct energy to the appropriate location in the brain and can modulate pathways that are not working as they should be, while leaving normally functioning circuits intact.

Already, protocols for the use of neuromodulation are being developed. "Our goal is to work on techniques to reach as many patients as possible," says Dr. Lipsman.

"If we can change the abnormal pathways in the brain that are leading to these mental illnesses, it is entirely possible that we might be able to offer not just treatment, but a cure for some patients," he says.



Dr. Anthony Levitt, chief of the Hurvitz Brain Sciences Program.

PHOTOGRAPHS BY DOUG NICHOLSON

Focused ultrasound

A non-invasive procedure, focused ultrasound uses high-frequency acoustic waves that reach hard-to-access areas in organs such as the brain or prostate.

Focused ultrasound is used in combination with magnetic resonance imaging (MRI), which allows physicians to see the geography of the brain in real time as the procedure is carried out.

After being given a local anaesthetic, the patient is outfitted with a "helmet" that contains more than 1,000 individual sources of ultrasound. "The multiple sources are necessary because ultrasound does not pass very well through bone," says Dr. Nir Lipsman, a neurosurgeon and scientist at Sunnybrook. The MRI is used to determine which region of the brain will be targeted. "The real-time nature of MRI further allows physicians to direct the helmet's multiple sources of ultrasound to focus on a precise target, coming to within one millimetre of accuracy," says Dr. Lipsman.

Years of experience and research have helped determine which areas of the brain are dysfunctional in specific disorders. For example, a less than five millimetre area in the brain's thalamus is where abnormal activity occurs in patients with Essential Tremor. MRI-guided focused ultrasound was used at Sunnybrook for the first time in 2012 to cure a man with severe tremors. In the case of depression, the brain's anterior cingulate area could also be targeted. For anxiety or obsessive-compulsive disorder, the focus would be the anterior limb of the brain's internal capsule, says Dr. Lipsman. Trials investigating focused ultrasound for these disorders are expected to begin at Sunnybrook within the year.

After the target is found, the power is increased "and HIFU heats the tissue and destroys neurons, tumours or other problem areas. You see the lesions develop before your eyes," Dr. Lipsman says.

Risks such as infection or bleeding in the brain are virtually eliminated because HIFU is non-invasive, performed without making a hole in the skull. And because patients are awake, they can report problems such as a pins-and-needles feeling or weakness, which may indicate the target is off.

Deep brain stimulation

Deep brain stimulation (DBS) is an invasive procedure that uses electrodes to stimulate certain parts of the brain. DBS has been in use for over 25 years to treat Parkinson's disease, and Sunnybrook's Centre for Neuromodulation intends to explore DBS to treat conditions such as anorexia and depression, according to Dr. Lipsman.

Before the procedure, neurosurgeons use an MRI to locate the target within the brain where electrodes will be implanted, to disrupt electrical nerve signals that generate symptoms.

Two electrodes are then inserted on each side of the brain through a hole made in the skull. The tip of the electrode is positioned within the targeted brain area. An extension wire is then passed under the skin of the head and neck, to a battery pack, implanted under the skin beneath the collarbone. The battery provides constant electrical stimulation to the brain.



PHOTOGRAPH COURTESY OF NORTH YORK GENERAL FOUNDATION

**GIVING BACK**

## Sharing the wealth of their new life

*The Nanjis' generosity has touched the lives of countless patients passing through Sunnybrook*

BY KATIE ROOK

**W**hen Gulshan and Pyrali Nanji fled persecution in Uganda in 1972, they and their four children were welcomed to Canada.

The couple pledged to one another that if they became financially able, they would give back to the country that had provided them with a safe refuge. The Nanjis have made good on their promise.

Respected and admired within and beyond their Ismaili community, the Nanji family's legacy of philanthropy is remarkable. They have donated millions of dollars to causes that are close to their hearts. Sunnybrook is one of the fortunate recipients.

Mr. Nanji is president and CEO of Belle-Pak, one of Canada's Top 50 Best Managed companies. He has also been recognized as one of Canada's Top 25 Immigrants, was awarded Male Entrepreneur of the year by the Indo-Canada Chamber of Commerce and won the Positive Aging Award in 2015.

The Nanjis' generosity is likely to touch the lives of many patients who visit Sunnybrook.

Their most recent donation means that more patients will be rapidly diagnosed by some of the most advanced magnetic resonance imaging (MRI) machines available. Once installation is complete, Sunnybrook will have four state-of-the-art MRIs, one fully paid for by the Nanji family.

"MRI impacts patients throughout the hospital every day," says Dr. Masoom Haider, chief of Sunnybrook's Department of Medical Imaging. "We

use MRI to detect life-threatening conditions. We use it to guide precision treatments, like cancer surgery and radiation. And its importance only continues to grow as we conduct research that pioneers new uses for MRI."

The Nanjis' involvement with Sunnybrook stretches beyond their gifts. They strive to better understand the hospital's needs by making regular visits and talking to doctors, researchers and hospital staff.

It's a dynamic established more than a decade ago, when they first learned of a growing need to support adolescents living with mood disorders.

Their donation toward brain sciences acknowledged an area of health care that, at the time, wasn't getting much philanthropic support. Other donors soon came forward, helping turn Sunnybrook's youth psychiatry division into the largest in Canada.

"My passion is to help youth who struggle with serious mood disorders that make everyday life a challenge," Mr. Nanji says.

The Nanji Family Foundation

**Opposite page:** Pyrali and Gulshan Nanji: Forced to leave their native Uganda, they prospered in their new home, Canada.

continued to support Sunnybrook, contributing to the expansion and renovation of the emergency department and creation of the Nanji Emergency Response Centre, which serves patients with acute needs and provides dedicated space for emergency psychiatric patients.

The foundation next made a major investment in two critical areas: the Nanji Ambulatory Centre, which occupies 30,000 square feet and is the location of Sunnybrook's out-patient clinics for dermatology, ophthalmology and vision sciences, plastic surgery and rheumatology, and the four-floor expansion of Sunnybrook's main wing. This helped to complete the world-class Women & Babies Program facility.

Many life-saving and patient-care improvements at Sunnybrook over the past 12 years can be traced back to the promise Mr. Nanji made to himself as he arrived at his new home in 1972.

"Giving back to a community that has given so much to us is just the right thing to do," Mr. Nanji says. 🍀

**"My passion is to help youth who struggle with serious mood disorders that make everyday life a challenge."**

Pyrali Nanji



# WHERE GERMS GO TO DIE

Of the many questions a patient scheduled for surgery may ask, how the medical equipment is cleaned and sterilized is most likely not one of them. Yet it's vital to a successful outcome.

At Sunnybrook, the Medical Devices Reprocessing Centre (MDRC) is at the heart of preparing and organizing all reusable medical tools, devices and accessories.

"Reprocessing involves cleaning, decontamination, packaging, assembling and then you sterilize," says Abdool Karim, who has been the MDRC's manager for 10 years. "What [MDRC staff are] doing is providing devices that are functional and sterile and free of any infectious agents – 100 per cent of the time."

In Sunnybrook's operating rooms – there are 21 at the Bayview site – the equipment ranges from small instruments such as those used for ear procedures to larger scalpels, forceps and retractors (which prop open everything from the mouth to the abdomen while the surgeon works), and metal bowls, spoons and trays.

Not all equipment is reusable; for example, saw blades for orthopaedic surgery are used once and discarded, while retractors can withstand hundreds of uses.

Here's an in-depth look at the MDRC, which handles about 2,000 pieces of medical equipment daily:

## THE STAFF

The MDRC is staffed 24-7 and has around 70 employees. Most are certified medical device reprocessing technicians (receiving up to a year of postsecondary school training). A supervisor and an educator are also on-site. Anyone inside the MDRC must wear clean scrubs, safety gear and masks.



## 1. THE DIRTY WORK

Equipment is first soaked in a special enzymatic solution that loosens and breaks up blood, bodily fluids and contaminants. Technicians sort and place 90 per cent of the equipment, usually made of metal (flimsier items like endoscopes are cleaned separately in special solutions), on carts that are pushed into one of the three state-of-the-art Getinge 88 Turbo washing/disinfecting machines.

Sunnybrook was the first hospital in North America to install the 88 Turbos, which resemble large industrial dishwashers and are now the gold standard for all hospitals. The machines whip around extremely hot water for 20 to 45 minutes (10 times faster than a car wash), spraying the equipment with powerful cleaning solutions. A lubricant, added during the final rinse, coats the instruments to keep them in top working condition.



## 2. SORTING AND PACKAGING

Technicians organize the Turbo-washed equipment according to the tools needed by surgeons for specific procedures. Certain pieces are "packaged" – put in a rigid (metal) container or wrapped in special paper – and placed on a tray, which is then bar-coded, as part of a system to ensure each surgeon gets all required tools for each procedure.

PHOTOGRAPHS BY DOUG NICHOLSON



## 3. STERILIZATION

The bar-coded trays are put on carts and placed into one of four industrial steaming units for final sterilization, at a temperature of up to 274° F.

## 4. CHECKS AND BALANCES

Certain "challenge tests" are done during the processes, says Karim. For instance, a little vial containing spores is in each sterilization unit. If the spores have been destroyed by the steam, any contaminants on the equipment have also been killed.

## 5. READY FOR USE

The bar-coded trays are wheeled on sterile carts to the operating rooms. A content sheet accompanies each tray, tracking each piece of equipment, so everything that leaves the MDRC is returned there for the next round of disinfecting, packaging and sterilizing. •

– Marlene Habib





Prince Amponsah and Anne Hayward meet following his performance in *Changeling* at the Box Theatre in Toronto.

THE FINAL WORD

## The second act

*An actor who nearly died in a house blaze returns to the stage*

BY MONICA MATYS

On a Saturday night in June, actor Prince Amponsah took a well-deserved bow on the Box Theatre stage in Toronto. His performance in *Changeling* marked his fourth role since returning to the stage following a devastating 2012 house fire. Prince lost both forearms in the blaze and was left to wonder about his own second act.

Physically, he endured months of rehabilitation, surgeries and skin grafts. Emotionally, he had to come to grips with his new reality. And Sunnybrook social worker Anne Hayward was there to help in the process. “He didn’t choose for his circumstances to happen and to enter the

hospital world, but that’s where our lives intersected,” she says. “It’s wonderful to now be on Prince’s turf and to see him living his life. I am so incredibly proud and inspired by him.”

Prince says he was equally inspired by Anne, who was instrumental in his decision to pursue a career in social work. Now in his first weeks of a four-year program, he hopes to follow Anne’s example and pay it forward. “It’s very easy to give up after such a traumatic event, but Anne kept me going. She kept asking, ‘Can you? Will you? It’s up to you.’ She helped me believe that right from the start, so now I’m making the most of it.”

PHOTOGRAPH BY DOUG NICHOLSON

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