

# Sunnybrook

SAVING LIVES, ONE INNOVATION AT A TIME

CHANGING THE  
CONVERSATION  
ABOUT SUICIDE

A TRAIL-BLAZING  
SURGERY THAT  
TRANSFORMED  
ONE MAN'S LIFE

TREATING  
CANCER WITH  
SUNNYBROOK'S  
FIRST-IN-CANADA  
TECHNOLOGY

A woman with long blonde hair, wearing a red top, is holding a realistic prosthetic eye in her hand. The eye is a light brown color and is being held up to the camera. The woman's face is in the background, slightly out of focus.

## *The* **ART** *of* **MEDICINE**

A novel approach to craniofacial prosthetics  
is improving Brenda Coulter's life



# MARK ALIASSA

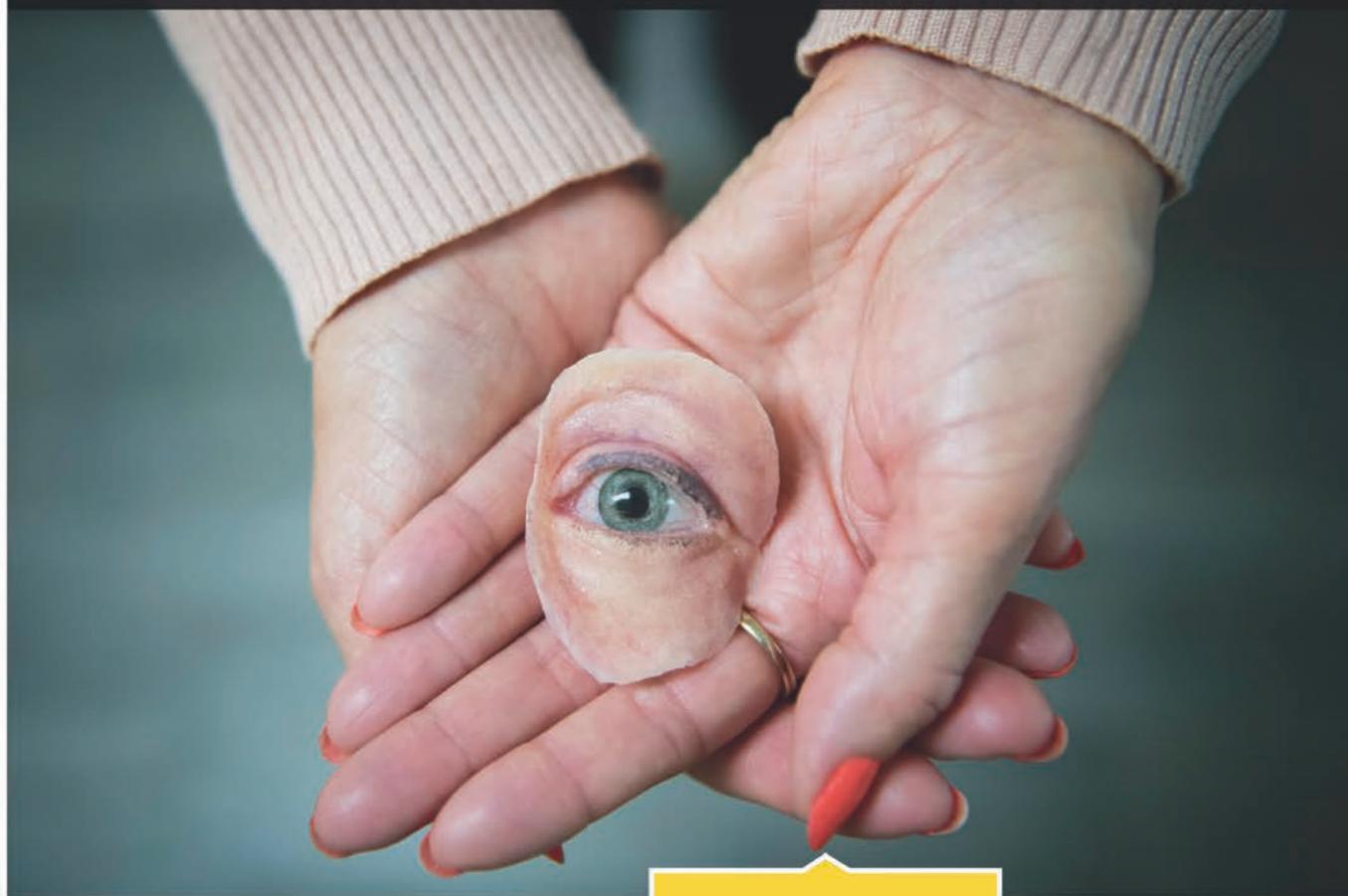
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PHOTOGRAPHY BY KEVIN VAN PRAESSEN

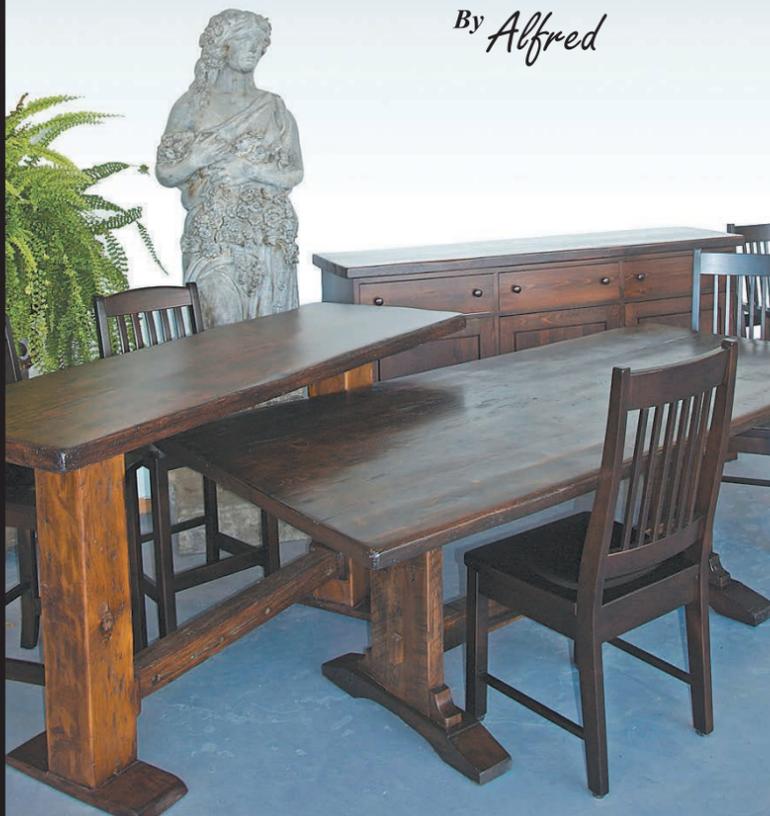
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the  
CARDIAC  
ANAESTHESIOLOGIST



the  
FERTILITY  
SPECIALIST

### Cycling back to health

For nearly two decades, Dr. Claude Laflamme has helped care for patients as a cardiac anaesthesiologist at Sunnybrook. During most of that time, he was also a patient: for years, he lived with chronic renal disease.

By 2012, however, his disease had progressed to the point that he needed a kidney transplant. "I was told to start looking for a living donor," recalls Dr. Laflamme. "Otherwise, I would have to go on dialysis."

Fortunately, he was able find a living donor in time – his sister, France, donated her kidney to him in 2014. "I was determined to take care of my new kidney and treat it with respect," he says.

As part of his commitment to a healthy lifestyle, Dr. Laflamme began cycling

up to five times a week. He became so dedicated to the sport that, last summer, he joined the Canadian team for three cycling events at the 2017 World Transplant Games in Málaga, Spain.

"It was inspiring to see all of these incredibly fit people – people you would never know had transplants by looking at them – leading such healthy and active lives," he says.

Dr. Laflamme returned from Spain with the goal of encouraging other transplant recipients to get involved in competitive sports.

"I'm now helping to create a community of transplant recipients and teams where we can talk about goal setting, motivation and coaching," says Dr. Laflamme. "I haven't felt this good in 20 years. Post-transplant, I'm healthier now than I've ever been."

– Sybil Millar

### Helping families weather the journey

"Look at this little one – all that hair!" Scrolling enthusiastically on her phone, Dr. Marjorie Dixon shows photo after photo of herself holding babies. In most of them, she's laughing or making a face at the baby, with both doctor and infant looking equally delighted.

What the images don't capture are all of the joyous parents taking the photos who have returned to see Dr. Dixon, sometimes after years of struggling with fertility issues.

"Helping families weather the journey is an honour and a privilege," says Dr. Dixon, a fertility specialist at Sunnybrook who also founded and runs a private fertility clinic. "I see people from every community, whether they're

single, married, or gay. They've often had a long road to hope and they're all here for one purpose."

She admits it's not always a happy ending. "Some patients just can't get pregnant. Regardless of the outcome, my role is to make sure the experience is manageable and to humanize the process."

Medical students and residents at Sunnybrook also see Dr. Dixon in action, giving her high ratings for her mentoring role. She smiles, reflecting on her own gynaecology internship in the 1990s at the hospital, where she earned the nickname Gyne Spice for her habit of singing in the OR.

In her office, amid the pictures of babies, her own family photos stand out poignantly.

"I have two sons and a daughter, and I've had IVF [in vitro fertilization] three times," says Dr. Dixon. "Each and every day is a miracle."

– Marie Sanderson



the RADIATION THERAPIST

## On the front line

Opportunity has knocked loud and fast for Ruby Bola. As a radiation therapist at one of North America's leading cancer centres, Ruby is on the front line, making improvements to enhance the patient experience and quality of care.

"I like to think outside of the box," she says, "or, in my case, outside of the bunker."

At every opportunity, Ruby takes initiative and encourages her colleagues to incorporate inquiry into daily practice and become thoughtful, innovative learners. "It's one way we can fill in the gaps that need to be addressed and meet the growing needs of our patients."

She has been with Sunnybrook's Odette Cancer Centre (OCC) for three years and was awarded the Practice-Based Research and Innovation Fellowship last fall. Supporting practice-based inquiry through fellowships is one way Sunnybrook is contributing to innovation and a culture of continuous quality improvement.

Ruby's research team provided the basis for the development of a new tool called the Individual-

ized Treatment Care Plan Summary. The radiation treatment information patient summary (rTIPS) provides brain metastases patients in the stereotactic radiosurgery program with an individualized, comprehensive outline of next steps and what to expect following their treatment. rTIPS is the only automated, interprofessionally developed treatment summary routinely being disseminated, not only at OCC but also to stereotactic radiosurgery (SRS) patients in Ontario.

Ruby has not only excelled in her clinical role but is also demonstrating that the breadth of a radiation therapist's role extends beyond the bunker, the shielded room that houses the radiation therapy treatment machine. She is part of the Patient Experience Committee, Site Group Peer Review, and is a U of T interprofessional education facilitator. She also sits on various committees at the provincial and national levels.

"Radiation therapy has many facets," notes Ruby. "It's more than simply treating the patient and managing side effects. The radiation therapist has an opportunity to make a direct impact on someone's life."

— Sally Fur

## Meeting patients' needs beyond the clinic

Growing up in Ottawa, Samia Elmi was well immersed in Canadian culture.

Originally from Somalia, Samia and her family moved to Saudi Arabia for a job opportunity for her father. Then, in 1991 her parents decided to immigrate to Canada, leaving behind difficult memories of the Gulf War and the civil war in Somalia.

"My parents are my greatest role models and [they] sacrificed a lot to ensure that I had a nurturing upbringing and comprehensive education," says Samia. "They led by example and demonstrated hardworking values."

Then, the Elmis made another move, settling in Toronto, where Samia graduated with a bachelor of science in nursing from Ryerson University.

As a registered nurse at Sunnybrook, Samia began her career working on various inpatient units, but it was at the Surgical Oncology Unit where she honed her knowledge and skills and developed a passion for oncology, the area of medicine that specializes in

the diagnosis and treatment of cancer.

In 2015, after completing her master's degree in nursing at Ryerson University, Samia was ready to embark on a new challenge. She became an advanced practice nurse (APN) at Sunnybrook's Odette Cancer Centre, where she is currently the lead for a new project called Live Voice Answer.

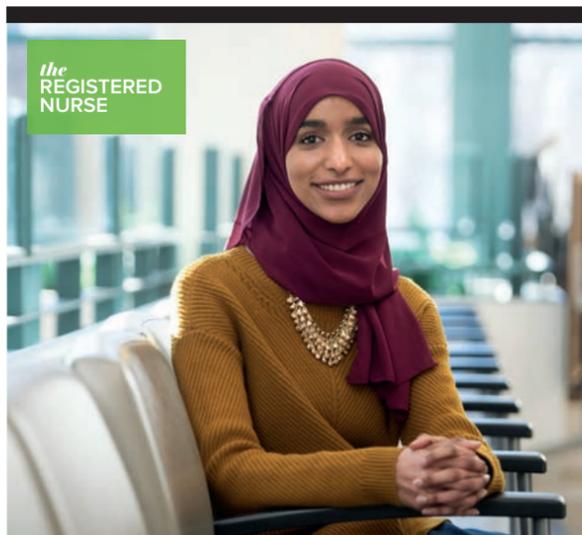
Whether it's a simple question or a distress call, the Live Voice Answer system gives patients phoning the nursing site lines the option to press 0 and speak directly to a registered nurse or to clerical staff.

"Being able to connect directly, rather than having to leave a voicemail message in a black hole, alleviates added stress and anxious feelings for patients," notes Samia.

With patient satisfaction soaring, the Odette Cancer Centre continues to expand Live Voice Answer to give more patients access to a live voice.

"This initiative has allowed me to meet patients' needs in ways I've never thought possible," says Samia. "Despite moving around a lot in my life both personally and professionally, here at Sunnybrook, I think I've finally found my home."

— Sally Fur



the REGISTERED NURSE

PHOTOGRAPHY BY DOUG NICHOLSON (RUBY BOLA), KEVIN VAN PRAESSEN (SAMIA ELMI)

## Balancing act

Asgar Rishu admits that a sense of humour helps during times of transition. In February 2013, when his family moved to Toronto from Saudi Arabia, it was bitterly cold and a huge adjustment for his two young sons.

"The boys had never worn jackets and found them uncomfortable. They threw their jackets in the street," Asgar says, laughing as he thinks back.

Flash forward to 2018. His sons are well settled in school with lots of friends. Both Asgar and his wife, Gousia, were qualified physicians in their home country of India. Gousia is now completing her internal medicine residency at the University of Toronto.

Meanwhile, Asgar is the project manager for BALANCE, a major international clinical trial at Sunnybrook looking at

whether seven days of antibiotic therapy is as good as 14 days among critically ill patients with bloodstream infections.

"I developed an intense interest in research and consider myself extremely fortunate to work with Drs. Nick Daneman and Rob Fowler, the two clinician-scientists leading the trial," says Asgar, who now has 30 publications to his credit.

When he's not engaged with families at Sunnybrook and organizing all aspects of BALANCE, Asgar handles life on the home front just as well. He happily shares details about an upcoming trip to a large indoor waterpark he has been planning for the family. And any day now, Asgar will find out the date his family will obtain Canadian citizenship.

Obviously, Asgar has found a good balance, not just at work but also in his personal life.

— Marie Sanderson



the PROJECT MANGER AND A DAD

PHOTOGRAPHY BY KEVIN VAN PRAESSEN



the SOCIAL WORKER

## Talking before it's too late

A go-getter by nature, social worker Wendy Kingsburgh jumped on the opportunity to participate in a fellowship program offered at Sunnybrook – the six-month Practice-Based Research and Innovation Fellowship, which provides front-line clinicians dedicated time to focus on a quality improvement project.

"This program has helped me connect my passion for advocacy and end-of-life care with research to change how we do things," Wendy says. "I have a new-found desire to make change on a system level, so many people can be helped."

Wendy's commitment stemmed from a very personal experience. In 2010, her father, Murray Kingsburgh, developed a cancerous tumour in his throat, which spread and didn't respond to treatment.

"Unfortunately, we didn't have an advanced-care planning conversation about his end-of-life wishes before he passed away.

Had we done that, we might have spent quality time at the cottage earlier that summer," she explains. "It's not always living longer that

matters. It's about how a person wants to make the most of the time they have."

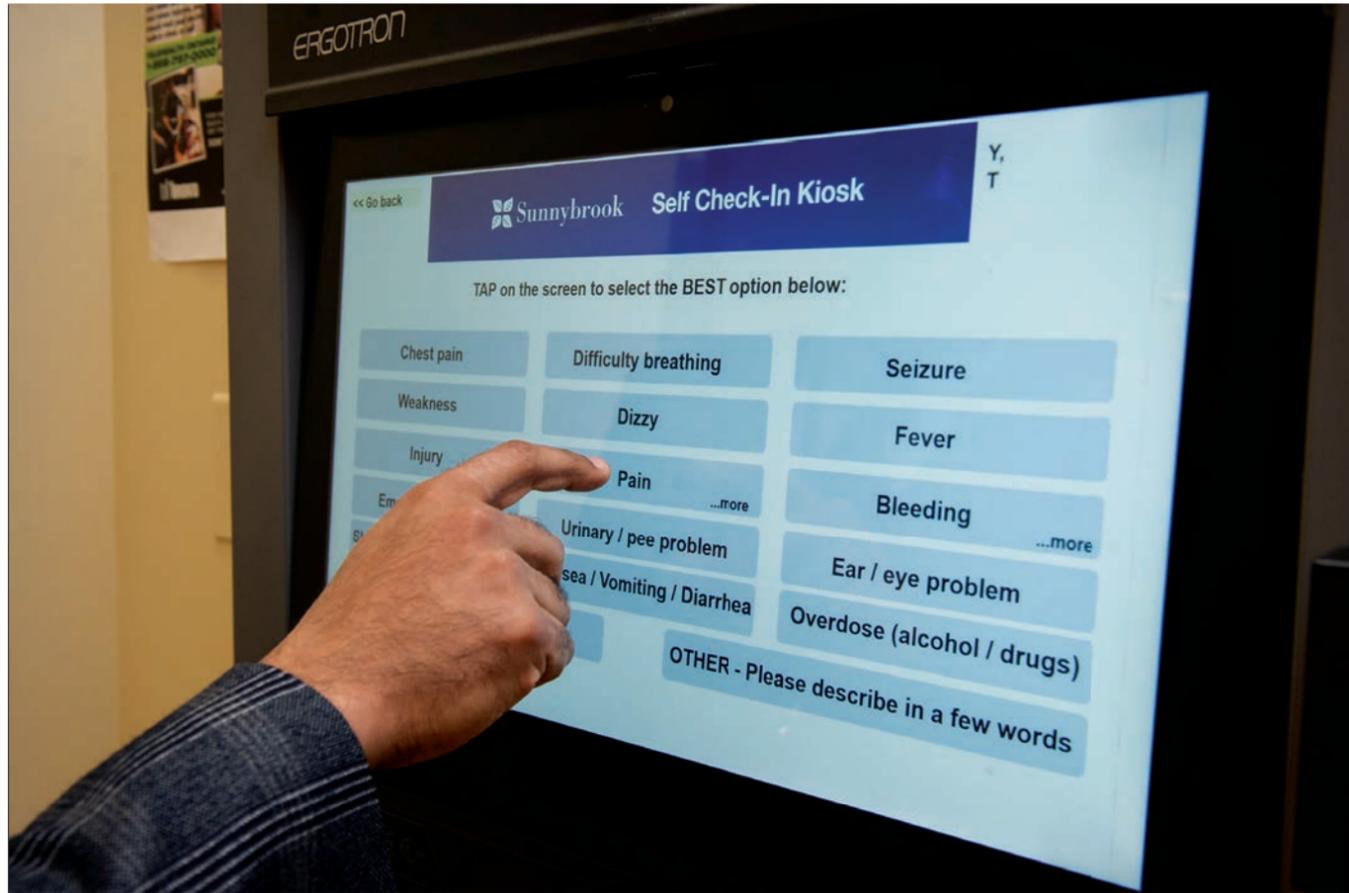
Her work focused on standardizing this type of conversation with patients by providing interprofessional teams with the steps needed to have a meaningful, documented talk at the bedside. "These conversations need to happen ahead of time and providers need to know how to open the door," she points out. "When we understand a person's values and wishes, it provides a lot of peace for caregivers and the patient."

Wendy's project – "Improving the Advance Care Planning Process for General Internal Medicine Patients and Families" – was designated recently by the non-profit Accreditation Canada as a Leading Practice, meaning it is noted for being particularly innovative and effective.

To further her work on this issue, she is currently enrolled at the University of Toronto Centre for Quality Improvement and Patient Safety (C-QuiPS) for a certificate course in quality improvement.

"Doing this research has had a huge impact on my life and work," says Wendy. "I want to continue to make an impact on others, too."

— Laura Bristow



## SELF CHECK-IN KIOSKS SHORTEN THE WAIT FOR PATIENTS

The first few minutes of a patient's arrival at an emergency department (ED) are often stressful and confusing. Sunnybrook's ED has developed an innovative way to streamline the first stage of patient contact with the hospital and improve the experience through the use of a self check-in kiosk.

"Self check-in kiosks are something we're seeing more in retail and travel," says Dr. Zuhair Alsharafi, interim chief of Emergency Services. "With planning and research, we figured out how to make this concept work for our ED patients."

When patients arrive in the ED, signage and staff direct them to one of two kiosks where they can quickly check

in. This includes swiping their health card and identifying their primary symptom from a list of common complaints. Patients then receive a how-to guide with next steps and a number, which they can track via electronic signs. Hospital security and volunteers are there to guide patients if needed.

The kiosks were developed at Sunnybrook, and a 10-week trial showed that there was significantly less time to initial patient-staff contact than without the kiosks.

"Our results were impressive. We saw that the average time to first contact with a patient was reduced from 15.2 minutes to 1.7 minutes," says Dr. Alsharafi. "The 90th percentile showed

a reduction from 31 minutes to 2.7 minutes with the kiosk intervention."

Surveys of patients and visitors indicated that the kiosk was easy to use, helped them feel calmer and informed, and increased their privacy. Moreover, surveys of nursing staff revealed that adding the kiosks improved the efficiency of triaging patients.

The initiative was awarded a Leading Practice honour from Accreditation Canada, the body that evaluates how well hospitals operate. Going forward, more language options will be added, a customized version will be developed for paramedics, and a high-risk patient alert is currently in the research phase.

— Laura Bristow



## SUNNYBROOK'S OUTDOOR SPACES BY THE NUMBERS

*Facts and figures about the Bayview (main) Campus*

total area of grassland  
**32 ACRES**

oxygen released by turf areas – enough for  
**APPROXIMATELY 2,200 PEOPLE** to breathe daily

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Sunnybrook's own species of rose is **29 YEARS OLD**

**28 TONNES** of compost generated annually from vegetative garden waste

— Monica Matys

PHOTOGRAPHY BY KEVIN VAN PRAESSEN



## RISK OF A SECOND STROKE DOUBLES FOR UP TO FIVE YEARS

After a person experiences a stroke or mini-stroke, the likelihood of having another is significant. This risk is highest early after the first stroke – in the first year, 15 times greater than for the general population.

Due to this high early risk, the major focus of stroke-prevention efforts for stroke survivors has been to closely follow them to avoid complications within a 90-day period. Those without early complications are then typically discharged from specialist stroke-prevention services within six months with recommended long-term prevention strategies.

But according to a recent study by stroke researchers at Sunnybrook, published in the *Canadian Medical Association Journal*, even initially stable individuals remain at substantial long-term risk for future strokes.

"For someone who

survives a stroke or mini-stroke and is initially free of complications, the risk of experiencing another stroke, a heart attack, dying or requiring admission to a care facility is doubled for up to five years," says Dr. Jodi Edwards, who was a postdoctoral fellow in the Canadian Partnership for Stroke Recovery at Sunnybrook and the Institute for Clinical Evaluative Sciences.

The research suggests that aggressive risk-factor reduction is necessary even after years of stability. "Stroke-prevention efforts are required for a longer period than initially thought," notes senior author Dr. Richard Swartz, a neurologist at Sunnybrook. "There is a real need to maintain risk-reduction strategies, medical support and healthy lifestyle choices over the long term, even years after a mild initial event."

— Nadia Radovini

### Strokes 101

A mini-stroke – also known as a transient ischemic attack (TIA) – occurs when blood flow to a part of the brain is reduced or blocked, but symptoms resolve quickly. TIA is a potential warning sign of an impending permanently disabling stroke.

Long-term risk-reduction strategies for a recurrent stroke should include:

- managing blood pressure, cholesterol and blood sugar levels;
- detection and treatment of irregular heart rhythms;
- smoking cessation;
- maintaining a healthy body weight, regular exercise and a healthy diet; and
- treatment of other, sometimes rarer, underlying stroke causes or risk factors, such as cardiac-related stroke and blood vessel problems.

## A STEP AHEAD

Researchers at St. John's Rehab are exploring a unique physiotherapy intervention. The goal of their research project, funded by the Canadian Partnership for Stroke Recovery, is to help recovering stroke patients who are back at their homes continue to make gains in their mobility.

The cognitive-augmented mobility program (CAMP) of biweekly sessions over eight weeks allows patients to participate in 90-minute individualized, goal-oriented, task-specific exercises in a group environment.

"The small group format created a social and welcoming setting and allowed for individual learning styles while, at the same time, we could guide the sessions using best evidence in stroke rehabilitation," notes Katherine Dittmann, a physiotherapist at St. John's Rehab and CAMP's

clinical research coordinator. The program adopts aspects of an approach that is also being explored at St. John's Rehab – Cognitive Orientation to daily Occupational Performance (CO-OP).

"We asked, 'What is important to you?' and [we] involved patients in setting their own goals," says Dittmann. "One

patient wanted to be able to lift his two-year-old grandchild. Another patient wanted to walk with ease from the subway station to his office. We help patients learn to problem-solve on their own – and continue to set and achieve goals when they no longer have a therapist with them."

Although the research is at a very early stage, investigators report that, to date, all patients have made and maintained clinically meaningful changes on at least one outcome measure. The largest improvements have been on self-selected goals and on balance and mobility scores.

– Natalie Chung-Sayers



## BLOOD PRESSURE MEDS DO DOUBLE-DUTY



For 80 per cent of Canadians with hypertension, medication is a major part of the treatment to lower blood pressure. But one type of anti-hypertensive medication – known as angiotensin receptor blockers (ARBs) – may be giving users the added benefit of protecting the brain against degeneration associated with Alzheimer's disease.

"Blood pressure medications may have different effects on cognition and the brain structures that control it," says Dr. Sandra Black, an internationally renowned neurologist at Sunnybrook.

"We suspect they impact brain energy metabolism differently and how the brain processes amyloid, the toxic protein that builds up in the brain to form amyloid plaques

– a hallmark of Alzheimer's disease."

A recent study authored by Dr. Black and her colleagues showed that people without Alzheimer's who were treated for hypertension with ARBs had significantly larger overall brain volumes, less shrinkage in the hippocampus (the brain region responsible for memory) and better cognitive performance than those treated with other high blood pressure medications.

Which medication your doctor prescribes depends on the severity of your hypertension, its causes and other health conditions. But with added brain protection, the research suggests that ARBs may be a more desirable option where appropriate.

– Katherine Nazimek

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for multiple  
types of  
cancer

# Suite Success

BY Marjo Johne

ELEKTA

THE MR-LINAC,  
A HYBRID  
RADIATION-  
MRI MACHINE,  
WAS RECENTLY  
INSTALLED AT  
SUNNYBROOK.

PHOTOGRAPHY BY DOUG NICHOLSON

**K**asia Moroniewicz's treatment last September in Sunnybrook's new MRI-brachytherapy suite made her one of the first patients in the world to experience an innovation that has dramatically changed cervical cancer therapy.

But being the suite's first user didn't matter much to Kasia. What impressed her most was how the designed-in-Sunnybrook super-suite cut down her time in hospital to about two hours from an entire day, and made the treatment significantly more comfortable.

"It was literally night and day," she says. "I woke up and that was it."

Before the suite was built, Kasia had gone three times for MRI-guided brachytherapy treatments to destroy tumours from her cervical cancer. The procedure involves magnetic resonance imaging of the cervix to find the tumours. This also involves the insertion of a tube-shaped vaginal applicator, where a radiation seed is positioned via a wire to emit radiation directly into the tumours.

During these first three treatments, the discomfort of having the vaginal applicator inserted for as long as eight hours, combined with the anxiety she experienced as she lay in the MRI machine, pushed Kasia, an elementary-school teacher in Brampton, Ont., to a few tears, she admits.

"You have those moments to think about what you're going through and it feels very scary," says Kasia, who learned last year she had cervical cancer just nine months after her first child was born. "And there are parts of the procedure that are just unpleasant. When they remove the applicator, that's the most uncomfortable part for me." →

The new all-in-one operating room has a built-in MRI and radiation treatment bunker to treat patients who are under general anaesthetic.

“In the short span of six months, we’ve revolutionized how we treat cervical cancer,” says Ananth Ravi, a medical physicist and one of the Sunnybrook scientists who led the MRI-brachytherapy suite project. “We’ve minimized the discomfort and trauma from the treatment.”

The MRI brachytherapy initiative is among the next-level innovations now available through Sunnybrook’s Cancer Ablation Therapy (CAT) Program – a specialized unit within the hospital’s Odette Cancer Centre that uses precision therapies to target tumours without invasive surgery.

Over the last two years, the program has brought in three first-in-Canada radiation technologies, including the MRI-brachytherapy suite for gynaecological cancers. The other two are the Gamma Knife Icon, used to treat brain tumours, and the MR-Linac, which combines radiation with MRI for real-time imaging during procedures and is now in the testing phase. Each of these technologies is designed to deliver precise treatment while advancing research in cancer ablation therapy.

“Sunnybrook is in a unique position to work with the companies that make these technologies because we are recognized as world leaders in cancer care and research,” notes Dr. Arjun Sahgal, a radiation oncologist and scientist at Sunnybrook. “For the people we treat at Sunnybrook, this means access to advanced precision instruments that are in the hands of some of the best oncologists and radiosurgeons in the world.”

**H**ow has the MRI-brachytherapy suite changed the treatment of cervical cancer? Radiation oncologist Dr. Eric Leung, the other lead in bringing the suite to Sunnybrook, describes what radiation treatment for cervical cancer was like before.

In the operating room, the patient is given an anaesthetic to go to sleep and then implanted with a vaginal applicator. She wakes up later in the recovery room and waits – often in discomfort – to be taken to the imaging department for an MRI. After the MRI is done, the patient is taken back to the recovery room where she waits while her doctors map out her treatment.

When the doctors have completed their treatment plan, she is then wheeled to the radiation bunker. A team of brachytherapy radiation therapists helps connect the brachytherapy unit to the applicator, where a high-dose radiation seed is moved into the applicator via a wire and positioned to emit radiation directly into the tumours revealed by the MRI.

“We have MRI images of where the brachytherapy applicators are in the pelvis, and we have marked out where the cancers are,” explains Dr. Leung. “The radiation seeds are connected to wires that go into the applicator tube, and they stay inside for maybe 10 seconds at a time, emitting radiation at each position in the applicator.”

Once the radiation procedure is finished, the patient is taken again to the operating room for removal of the applicator. Her last stop is the recovery room, where she will spend the final hour of a long day that can extend to as long as 10 hours.

Compare this experience to treatment in Sunnybrook’s new MRI-brachytherapy suite, where patients are anaesthetized and implanted with the applicator in the operating room, then placed immediately after in the MRI machine in the adjoining room before going back to the operating room for radiation. Patients are asleep the entire time.



**‘IT WAS LITERALLY NIGHT AND DAY. I WOKE UP AND THAT WAS IT.’**

KASIA MORONIEWICZ

“It’s a faster procedure, taking about two-and-a-half hours compared to eight to 10 hours,” Dr. Leung points out. “When the MRI machine and operating room are right in the same suite, it gives patients an optimal experience because we can do the applicator implant, wheel them into the MRI and then plan and do the treatment right away.”

According to Dr. Leung, the suite opens the way toward real-time imaging during radiation. The MRI is housed in a radiation bunker, allowing patients to be treated while they’re in the machine. “Right now, not all of our radiation equipment is compatible with MRI, which contains a very powerful magnet,” he says. “But full MRI compatibility is currently in the works.”

The suite can be used in future for other types of cancer that are typically treated with brachytherapy, including prostate, breast and gastrointestinal, notes Dr. Ravi. A number of hospitals in other Canadian provinces and in the U.S. have approached Sunnybrook about the suite, he adds.

“We’ve had queries about the suite. There is definite interest and there’s even a book that’s been published that includes a chapter on our particular design,” says Dr. Ravi. “When we first started to do this, it seemed like an outlandish idea, but in the short span of six months, we’ve revolutionized how we treat cervical cancer, so it makes sense to expand that to other types of cancer.”

KASIA MORONIEWICZ (WITH SON NIGEL) WAS THE FIRST PATIENT TO EXPERIENCE A NEW DESIGNED-IN-SUNNYBROOK SUITE FOR TREATING GYNAECOLOGICAL CANCER.

MEDICAL PHYSICIST DR. ANANTH RAVI (LEFT) AND RADIATION ONCOLOGIST DR. ERIC LEUNG WERE INTEGRAL TO THE DEVELOPMENT AND IMPLEMENTATION OF THE MRI-BRACHYTHERAPY SUITE.

PHOTOGRAPHY BY KEVIN VAN PRAASSEN



## THE MRI-BRACHYTHERAPY SUITE: BEFORE AND AFTER

### MRI BRACHYTHERAPY BEFORE THE SUITE

- Under anaesthesia in the OR, patient is implanted with a vaginal brachytherapy applicator.
- She is taken to recovery room.
- She goes to imaging department for an MRI.
- She returns to recovery room while doctors plan her treatment based on the MRI. Around this time, she regains consciousness and anaesthesia starts to wear off.
- She is taken to radiation bunker for treatment.
- She returns to the OR, where the vaginal applicator is removed.
- She is taken back to recovery room.
- Patient leaves the hospital. All told, she would have spent between 8 and 10 hours that day in hospital.

### MRI BRACHYTHERAPY IN THE NEW SUITE

- In the operating room, the patient is anaesthetized and implanted with a vaginal brachytherapy applicator.
- She is placed in the MRI machine in the adjoining room.
- She goes back to the OR for radiation treatment, after which the vaginal applicator is removed.
- About two-and-a-half hours later, the patient wakes up and is ready to go home.



◀ RADIATION ONCOLOGIST DR. ARJUN SAHGAL (LEFT) WITH ANDREW STEWART, WHO WAS TREATED FOR BRAIN CANCER WITH THE GAMMA KNIFE ICON, A PRECISION-RADIATION DELIVERY TOOL.



# Gratitude rebuilds lives

**F**irst-in-Canada technology at Sunnybrook made it possible for Andrew Stewart to undergo radiation surgery, known as radiosurgery, to heat and destroy the cancer cells in his brain, and show up at his workplace the next day.

Last June, the 78-year-old entrepreneur – whose melanoma skin cancer had spread to his lung and later to his brain – came to Sunnybrook for treatment with the Gamma Knife Icon, a new frameless, high-precision tool that delivers effective doses of radiation to target tumours while sparing the surrounding healthy brain tissue. “I came out of the procedure with no side effects. I could have driven myself home,” says Andrew, who lives in Caledon, just outside Toronto. “I was back at work running my business the very next day.”

The Gamma Knife Icon is used for brain stereotactic radiosurgery treatments by focusing hundreds of low-dose radiation beams on a single tumour. The beams are emitted by 192 radiation sources set out in a conical pattern – an arrangement that causes the beams to converge when they hit their target. This allows for the delivery of a concentrated dosage of radiation that effectively destroys cancerous tissue.

Before stereotactic radiosurgery came along, tumours that had spread to the brain were generally treated with whole-brain radiation, which often affected memory and other cognitive functions because it also damaged healthy tissue. Sunnybrook had acquired the Gamma Knife Icon last November but, this year, upgraded to the fully integrated unit with a mask-based safety system.

“At that point, the unit became exactly what we wanted, which was a fully-integrated, image-guided brain radiosurgery instrument, where you no longer have to put the patient’s head into a frame,” says Dr. Sahgal, whose team consists of radiation doctors, neurosurgeons, radiation therapists and radiation physicists.

Before Sunnybrook got the new unit, patients undergoing brain radiosurgery needed to get their heads immobilized with a frame that was, essentially, screwed on to the skull. Dr. Sahgal says the screws punctured the skin and often caused pain and discomfort for patients. “Depending on the number of tumours or lesions they had, some patients would have to be in the frame for several hours,” he says. “It’s a painful experience, and patients need time for the punctures to heal.”

With the new unit, a plastic mask moulded to the patient’s face is used to keep the head still. Throughout the treatment, an

infrared positioning device watches for the slightest head movement. “From an outside console, we watch in real time to make sure there’s no motion because if there is, we stop the beam,” Dr. Sahgal explains. “That’s what makes it so safe and precise.”

Sunnybrook treats an average of five people a day with the Gamma Knife Icon, he says. This work also feeds research with Sunnybrook’s medical physicists and the Sunnybrook Research Institute to improve various aspects of stereotactic radiosurgery, such as treatment planning, imaging quality and MRI response.

“We have a major research program centred around this machine,” Dr. Sahgal notes. “We are building new trials in order to ask and answer questions about the treatment of brain metastases that can only be asked and answered with the Icon. We also lead a North American Icon research group, and this is something we are very excited about.”

PHOTOGRAPH BY KEVIN VAN PAMSEN

## VENEZIA: NEW BRACHYTHERAPY APPLICATOR ENABLES ACCESS TO HARD-TO-REACH TUMOURS

In its advanced stages, cervical cancer often extends outside the cervix into the vagina and the area beyond, called the perineum. This makes the cancer hard to treat because conventional brachytherapy applicators do not reach outside the cervix.

This year, Sunnybrook became the first hospital in Canada to use a new brachytherapy applicator, called Venezia, which can reach more tumours in women with advanced cervical cancer. Used in MRI-guided brachytherapy, the new applicator is designed to give doctors access to hard-to-reach areas beyond the cervix.

“It’s the ultimate interstitial brachytherapy applicator designed to treat aggressive tumours, with multiple degrees of freedom to put in radioactive needles in different angles and different locations,” explains Dr. Eric Leung, a radiation oncologist at Sunnybrook.



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# GAME CHANGER

The MR-Linac, a massive hybrid radiation-and-MRI machine, aims to change the way cancers are treated

Soon doctors at Sunnybrook's Odette Cancer Centre will be able to watch a beam of radiation move through a patient's body in real time, directing that beam precisely at a tumour.

This groundbreaking technology is called the MR-Linac. "MR" refers to MRI (magnetic resonance imaging); "Linac" refers to linear accelerator, the machine that delivers the radiation.

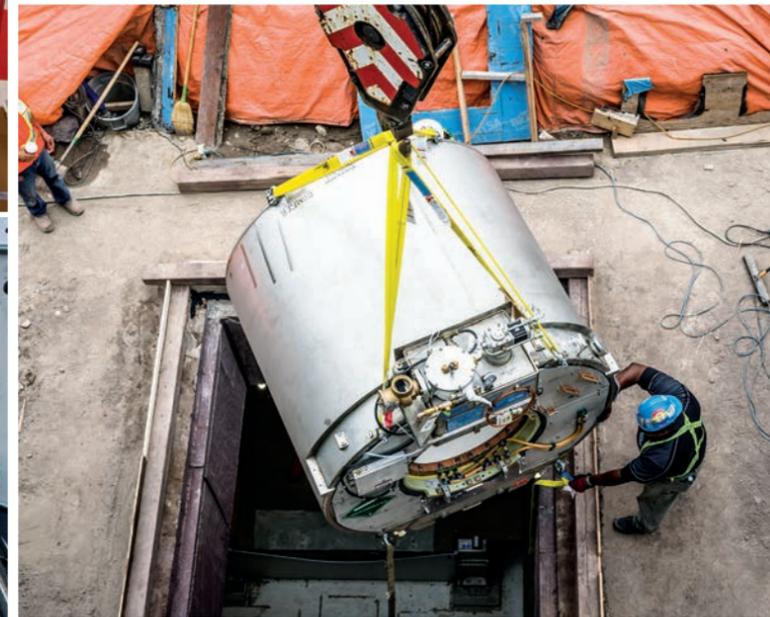
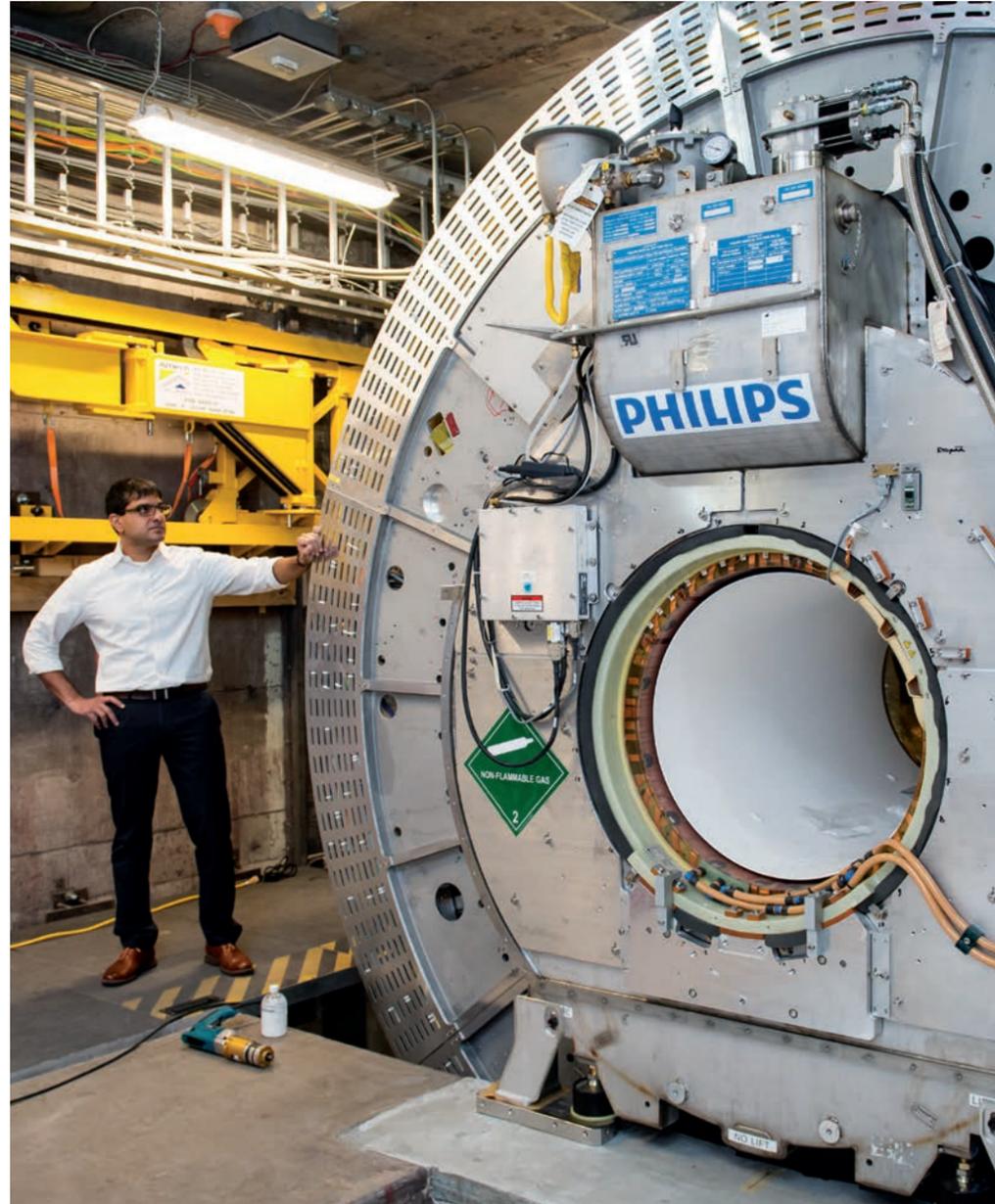
The MR-Linac is the first machine to combine radiation and high-resolution magnetic resonance imaging. Thanks to the machine's real-time imaging, it lets doctors and radiation therapists at the Odette Cancer Centre target tumours and monitor their response to radiation with unparalleled precision. They will be able to see immediately whether a tumour is responding to radiation.

Sunnybrook is the first hospital in Canada to install this machine, which promises to be a game changer in the way cancer is treated.

**2012** Sunnybrook becomes a founding member of the seven-member international MR-Linac Consortium. Member hospitals are hand-picked for their expertise by Elekta and Philips – the MR-Linac's manufacturers – to refine, test and use the machine to treat patients.

**FALL 2016** Construction starts on the specialized radiation bunker that will house the MR-Linac. Major tweaks had to be made to the existing room to reinforce the floor (so it could support the MR-Linac's six-tonne weight), a hole was cut in the ceiling to lower the machine in, and the room was lined with lead to make it safe to use radiation in the space.

**FALL 2017** Set-up and calibration on the massive machine continues. In September 2017, a beam of radiation in the MR-Linac is turned on for the first time in Canada.



## ▲ JULY 2017

The MR-Linac installation begins. It took a team of a dozen people and one very large crane a full day to lower the giant machine in parts into its bunker through a hole in the ground along the Odette Cancer Centre's west wall.

## ◀ WHAT'S NEXT?

Once Health Canada approves the MR-Linac for research use, the Sunnybrook team will start several clinical trials with the machine to help perfect its use. Sunnybrook is the lead site in the development of the machine's use in brain cancer.

PHOTOGRAPHY BY DOUG NICHOLSON AND KEVIN VAN PAASSEN

# TRANSFORMING THE ARTISTRY AND SURGERY BEHIND FACIAL RECONSTRUCTION

*Meet the Sunnybrook team that creates life-like facial prosthetics for implantation*



BY Alexis Dobranowski  
PHOTOGRAPHY BY Kevin Van Paassen

Brenda Coulter is grateful she's alive. Brenda was driving along Highway 403 in June 2014 when a piece of metal boomeranged through her windshield and sheared off most of her face. Miraculously, she managed to stop the car safely.

After she was stabilized at a local hospital, Brenda was airlifted to Sunnybrook. There, trauma surgeons performed a 15-hour life-saving surgery to rebuild her skull and much of her face, using her driver's license photo as reference.

"Since then, I've had 12 surgeries to reconstruct my face, which is now about three-quarters titanium," says Brenda, who is now 58 years old. "My right eye has extreme damage to the cornea and optic nerve, but the team saved the eye, so I have a little bit of vision. I lost my left eye."

Brenda's orbital cavity, where her left eye used to be, is smoothed over with skin taken from other parts of her body. She has an adhesive prosthetic eye socket and eye, which she can glue into place.

"Affixing my prosthetic is a real challenge because I'm partially sighted, so I can't see to put it on correctly," Brenda notes. To attach an adhesive prosthetic, the wearer must smear glue onto the back of the prosthetic, use a blow dryer to help it dry and then

manually determine where to place it.

"And if I get it wrong and there's a big gap or it's crooked, my husband says, 'Brenda, something's not quite right with your eye,' and I have to remove it and start again, often three times," she says. "I actually just stopped wearing it and either go out without it or decide to stay home."

Late last year, Brenda got word that new funding is available for surgical implants for craniofacial prosthetics. Surgical implants are

two or more screws that hold magnets to allow the wearer to just snap a customized prosthetic into place. For Brenda, the magnetic points to attach her prosthetic will make a world of difference.

"Having this surgery will simplify my life," she said before her surgery in early January. "It's called an elective surgery. But to me, it's not that at all. After an injury like mine, it's not just the bleeding that requires attention. There's so much more. This new prosthetic – and the magnets to stick it on –

will make a huge difference in my life. When I go out, I get stared at. It will be nice to feel normal again."

#### **Brenda's 13th surgery**

Brenda's latest experience felt similar to the 12 surgeries before. She was anaesthetized and fast asleep. But for the surgical team, it was a whole new ball game.

Brenda was the first patient at Sunnybrook – and in the world – where surgeons used a state-of-the-art navigation system to help guide the placement of two 3-millimetre screws.

As a prosthodontic resident (a dentist who specializes in the replacement of teeth) and a master's student at the University of Toronto, Dr. Eszter Somogyi-Ganss participated in the creation and evaluation of a new navigational system that allows surgeons to connect a previous CT image to the patient's anatomy in real time and then easily navigate the implants to the bone on the patient's face. Designed for use in dentistry, the system is currently being modified and tweaked for use in other facial surgeries.



Dr. Kevin Higgins (right) and Dr. Fred Laliberte (left) use a new navigational system to help guide the placement of two 3-millimetre screws.

Now a maxillofacial prosthodontist in Sunnybrook's Craniofacial Prosthetics Unit in the Department of Dentistry, Dr. Somogyi-Ganss works with surgeons to examine CT images and plan where best to place the surgical screws. The team then loads up the plan into the navigation system and it guides their hands and drill to the right spot.

"To place surgical implants, the surgeon may have to drill up or down or sideways," she explains. "This computer-guided system tells the surgeon: 'Drill here. Drill this deep. Drill on this angle.'"

And it all happens in real time.

"This system is like a glide path in an aircraft," says Dr. Kevin Higgins, one of the head and neck surgeons at Sunnybrook who performed Brenda's surgery. "You have your flight path, and if there's any deviation, you get an alert. It tells you to stop. This surgical system guides exactly how you are holding the drill – the pitch, the yaw and the roll – so you get optimal placement. It's taking precision placement to the next level."

Typically for surgeries like this, a pre-operative image is used to plan the screw placement, and a guide mask is made out of plastic and placed over the patient's face. Surgeons then drill into the premade holes in the template, keeping an eye on the previously completed image. But imaging isn't always 100 per cent accurate and the masks rely on being placed in the exact same spot. The masks also don't allow the surgeons to make adjustments in the moment.

"With the navigation system, if you've figured out that the bone isn't good enough and you want to move three millimetres to

the right, you can change the position of the implant on the computer and it will navigate you three millimetres to the right," Dr. Somogyi-Ganss says. "It's very flexible."

A difference of even just a few millimetres can make or break a surgical implant, according to Dr. Higgins. "Some of these patients don't have a lot of bone left or they've had radiation therapy, and so, the bone is less reliable and is thin," he explains. "And you can't put the implant in air – like an eggshell of bone with air underneath it – because it won't take. It won't stay or it will just get infected. It's like

hanging a picture on a thin wall. It won't work; you need an anchor point."

He hopes the new navigational system will take an already accurate surgical procedure and make it even more precise, while also making the pre-operative experience easier on patients by eliminating an extra CT scan and the need for a mask.

All of this lays a solid foundation for the next step in the process.

"The real essence of the program is the prosthetic. If the anchor points are stable, the anaplastologists can make the rest happen," says Dr. Higgins, referring

to the specialists who make prosthetics. "That's where the artistry is."

Dr. Somogyi-Ganss notes that the Craniofacial Prosthetics Unit team is like a village. "It takes the whole team to plan, make the prosthetic, execute the surgical implant and then place the prosthetic properly. It's not a quick fix," she says. "But if you make and fit an implant-retained prosthetic for a patient who has trouble wearing a glue-on one, that's a major victory for all of us."

Dr. Higgins agrees. "If you can imagine someone who'd otherwise be covered in a mask or not going outside [and] completely socially

withdrawn, to now be able to go out into public and be treated like any other human being, to re-enter the workplace, to have a social life – that is quality of life, which is immeasurable. As we advance our ways of treating traumas and cancers, we must advance the ways we provide quality of life, too."

#### After the surgery

Brenda continues to adjust to life with a visual impairment. A hair colourist and technician before her injury, she can no longer work in that field. She has, however, found joy in other things – acrylic painting in bold

colours, attending Blue Jays games with her husband, Michael, and travelling down south each year.

As her implants stabilize over the coming months, Brenda is waiting patiently until she can start the next step of her magnetic prosthetic – the modelling, painting and fitting.

"This one wasn't life-saving surgery, but it *was* life-changing surgery. I'm so excited for my new prosthetic," Brenda says. "People have always been kind since my injury, but it's always about my face. I get lots of questions. It'll be nice to be in the world and it won't always be about that." 🐾



CLOCKWISE FROM OPPOSITE PAGE:

Dr. Kevin Higgins examines Brenda Coulter several weeks after surgery.

Brenda meets with anaesthesiologist Dr. Jordan Tarshis on her way to surgery.

Dr. Kevin Higgins (right) uses, for the first time, a new surgical-navigational system, which maxillofacial prosthodontist Dr. Eszter Somogyi-Ganss (centre) helped to design.

## INSIDE SUNNYBROOK'S CRANIOFACIAL PROSTHETICS UNIT

Sunnybrook's Craniofacial Prosthetics Unit (CPU) is the only multidisciplinary clinic in Ontario where surgeons, dentists and anaplastologists work as a team. The only other unit like it in Canada is in Edmonton.

Sunnybrook's CPU team is made up of two anaplastologists (specialists trained in the art and science of creating custom prosthetic devices), two head and neck surgeons, a coordinator and a maxillofacial prosthodontist (a highly specialized dentist who is an expert in the prosthetic rehabilitation of patients with facial differences due to trauma, cancer or congenital malformation).

The team makes and fits about 50 prostheses per year – for a mix of new patients and existing patients. Prostheses last about two years before they start to wear out and undergo colour changes.

Patients come from all over Ontario and some from other provinces and even beyond. Prostheses for Ontario residents are partially funded by the Assistive Devices Program of the Ministry of Health and Long-Term Care – 75 per cent, with the balance being the patient's responsibility.

This is the first year that surgical implants will be 100 per cent funded by the Ministry of Health and Long-Term Care for Ontario residents. Sunnybrook's team will do about 15 surgical implants this year.

Reasons for requiring a facial prosthesis:

- 44 per cent: cancer
- 37 per cent: congenital
- 14 per cent: trauma
- 5 per cent: other

# FINE FORM

Here's the step-by-step process that Sunnybrook has developed for building a craniofacial prosthetic with 3-D printing

Meet the newest member of the team in the Craniofacial Prosthetics Unit (CPU). It chugs through the long, dark hours of the overnight shift. And it doesn't take any breaks.

This team member is a 3-D printer, brought in to help Sunnybrook's craniofacial team save time and eventually reach more patients. "The new printer takes away the four or five hours it would take us to sculpt an ear in wax," explains

anaplastologist Ann McLaren. "We are so keen to learn and use this new technology. It is the future."

Used worldwide to make everything, from trinkets and cup holders to medical devices and cars, 3-D printers generate solid three-dimensional objects from a digital file through a layer-by-layer printing process.

At the CPU, McLaren and her colleague David Morrison create prosthetics for people

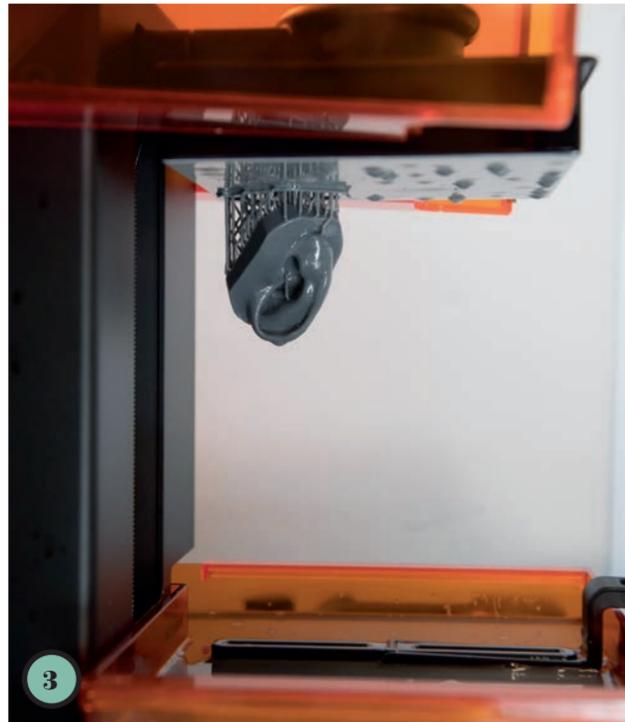
who do not have an eye, ear or nose due to illness, injury or birth defect. It's a long process with many steps as well as a lot of artistry.

The recent addition of this 3-D printer to their team is streamlining their workflow. McLaren, a figurative sculptor and former makeup effects artist for the film industry, explains how the CPU team uses the 3-D printer in the process of making prosthetic ears.



1

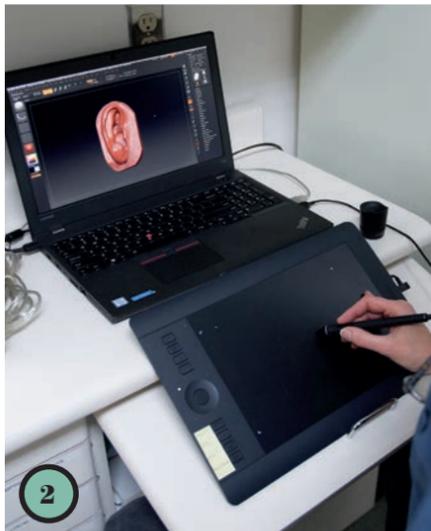
First, an impression is taken of the patient's existing ear (if the patient has one). Then, using a scanner, the team scans that impression into a computer. The 3-D printer is ideal for making prosthetic ears because it allows McLaren and her colleagues to easily take impressions and scan patients' ears. For nose and eye prosthetics, however, McLaren notes that the team still uses sculpting techniques.



3

The file is then downloaded to the CPU's SLA (stereolithography) 3-D printer. The printer's build platform lowers into a tray containing a fine layer of liquid resin, which is hardened by a laser. Lowered again, the platform exposes more liquid resin for the laser to harden. Repeated multiple times, this procedure creates a finished printed ear. The 3-D printer allows McLaren and her colleagues to make the prosthetic an exact match in size and shape to the existing ear. If there is no existing ear, the team will either sculpt it from previous photos or scan and print a family member's ear, if available.

Before the CPU had the 3-D printer, the team would hand-sculpt a reverse ear in order to create a mold.



2

On the computer, the image of the scanned ear is reversed and turned into a mirror image. If needed, adjustments and slight corrections are made to the shape and size of the prosthetic.



4

Usually, the 3-D printer does its magic overnight. "In the morning, we come in and the ear is waiting for us," McLaren says. "We clean it up and cure it in a UV [ultraviolet] light box." But it isn't the prosthetic yet, she notes, because the material is too hard and inflexible.



5

McLaren and her team make a rubber mold of the printed ear and fill it with wax, producing a wax copy of the ear. Wax is used because it lets them modify the ear to fit onto the patient's face. Depending on the patient's needs, the wax ear prototype is contoured and trimmed to suit where the prosthetic will be located. During the sculpting process, care is taken to achieve a fine skin texture, as well as wrinkles, so the final prosthetic will blend in with the patient's skin. Once those adjustments are made, the final mold is created.



6

If the prosthetic is going to be surgically implanted, McLaren says the CPU team then works with Dr. Ezster Somogyi-Ganss, a maxillofacial prosthodontist, to plan and place the hardware (shown above) for the prosthetic.



7

Next, the team creates the silicone prosthetic ear. Every prosthesis must be custom-colour-matched to the patient's skin tone, McLaren points out. Once the colour tone is determined, the silicone is layered into the mold, then baked in a laboratory oven. The patient then comes in for a final fitting, which is when skill and artistry are important.

"We double-check that the prosthetic will sit flush to the face. We match the skin colour and add texture through freckles, capillaries and veins," McLaren explains. "That's when the prosthetic really comes to life. At the end of the process, if the patient is happy, I'm happy."

Prosthetics help restore patients' self-confidence. Some of McLaren's patients have told her that, before they got prosthetic ears, for years, they wouldn't get their hair cut, so the hair would conceal the missing ear. Or they'd always wear hats.

"[Now] they are excited they can wear their hair tied back, or wear an earring, or go [somewhere] and not have people stare," McLaren says.

"We are delighted to have the 3-D printer as part of our team. It's changing lives."

PHOTOGRAPHY BY KEVIN VAN PRAASSEN



# NETWORK FOR HEALING

A unique collaboration of experts gives patients with a rare skin disorder a fighting chance

BY Judy Gerstel  
PHOTOGRAPHY BY Kevin Van Paassen

## On a wall of the intensive-care burn unit where Sonia Whyte-Croasdaile was a patient for six weeks – her skin sloughing off her face and body – was a full-size photo of Sonia taken when she was healthy.

“I had to bring in a picture, so they could see who she was,” says her husband, Joseph Croasdaile.

Sonia’s illness began with flu-like symptoms. Less than a week later, her body was fully covered with burn blisters.

The results of a skin biopsy confirmed the suspected diagnosis. Sonia was one of the two in a million people struck by the little-known but life-threatening Stevens-Johnson Syndrome (SJS), a rare condition, often triggered by an adverse drug reaction.

“The term SJS is used for several similar diseases,” explains Dr. Neil Shear, head of Dermatology at Sunnybrook. “Some are viral-induced and mostly involve the eyes, mouth and genitals. Some are drug-induced and can involve the body skin as well as the mouth, eyes and genitals. SJS in any of its manifestations is a horrific disease.”

When the disease becomes even more severe, as it did in Sonia’s case, with a mortality rate as high as 40 per cent, SJS is referred to as toxic epidermal necrolysis spectrum (TENS).

According to Dr. Shear, early diagnosis and treatment by an interdisciplinary medical team, “people with experience who understand the nuances of the disease,” is key for a positive outcome.

The challenge in treating TENS is that every surface of the body is affected, including all the mucous membranes – mouth, throat, airways, eyes, nose, genitals. It can also affect the kidneys and cardiovascular system.

At Sunnybrook, patients with TENS are treated in the Ross Tilley Burn Centre, where the multidisciplinary medical team is led by Dr. Shear and the centre’s medical director Dr. Marc Jeschke.

The Sunnybrook team includes not only dermatologists and burn specialists, but also ophthalmologists, respirologists, gynaecologists, urologists, ear, nose and throat specialists and plastic surgeons.

Dr. Shear and his team of specialists have developed the Sunnybrook Protocol for SJS/TENS. The first Canadian protocol for dealing with the disease, it’s been published in the *Journal of Cutaneous Medicine and Surgery*.

◀ *Sonia Whyte-Croasdaile suffered from a rare toxic epidermal disease, which affects every surface of the body and requires extensive treatment from a multi-disciplinary team of specialists.*

## ARE YOU AT RISK?

Stevens-Johnson Syndrome (SJS) is a serious disease that causes blistering and sloughing of the skin and mucous membranes, affecting all body surfaces. It can also quickly develop into toxic epidermal necrolysis spectrum, or TENS, which can be fatal if not treated promptly in a burn unit by an interdisciplinary medical team experienced in treating the disease.

The mortality rate is 30 to 40 per cent.

The disease is an immune reaction that, in some cases, is triggered by certain drugs interacting with specific genetic markers. People can be screened for these genetic markers before they’re prescribed the drugs known to trigger the disease. One of these drugs is allopurinol, often prescribed for gout.

Certain populations are particularly prone to SJS/TENS, according to Dr. Neil Shear, head of Dermatology at Sunnybrook. Those who are most at risk are people from South Asia, southern Pakistan, southern China and the Philippines.

Even having one parent from those areas increases risk. People from Japan, Korea and northern China are not in the high-risk group.

Being in the higher-risk group doesn’t mean you have the known genes that can interact with drugs that may trigger SJS/TENS, says Dr. Shear, nor does it mean that if you have the gene, you would develop the disease if you take the drugs.

However, his recommendation is that everyone in those populations at risk should be screened.

“There are genetic aspects to this disease that we don’t know about yet,” he points out. “It’s very tough to predict.” He recommends using alternative drugs, even if the patient is not in the high-risk group. But in some cases, the trigger is never determined.

Patients should also be aware of the early symptoms of the disease, including rash, eye irritation and flu-like symptoms, especially if they have started a new drug.



◀ *Dr. Neil Shear, head of Dermatology at Sunnybrook, developed the first Canadian protocol for dealing with the often fatal disease SJS/TENS.*

“It is a miserable thing to see. I can’t overstate how horrible this disease is,” says Dr. Shear. “It’s a burn from the inside out. It looks like a burn, but it’s the immune system causing it, as opposed to high temperature.

“What happens is the immune system gets fired up and starts attacking the outer layers of skin, the eyes, genitals, throat, lips. It’s like a flesh-eating disease with cell digestive enzymes eating the skin.”

Of the 300 patients treated every year at the Ross Tilley Burn Centre – the largest burn centre in Canada – up to 10 are admitted with SJS/TENS. These patients spend about four to six weeks at the centre.

“It’s a very challenging patient population,” says Dr. Jeschke. “But for the patients who do survive, healing is quite good. The organs recover, and [there is no] scarring of the skin.”

Unlike temperature burns, SJS/TENS affects only the epidermis, the upper layer of the skin. The dermis, or structure of the

skin, which is damaged with third-degree temperature burns, remains intact with SJS/TENS.

Sonia’s skin is now smooth and luminous. “The blisters dried up miraculously and disappeared,” says Sonia, now 50 years old. But seven years after her diagnosis, she is still bothered by bright lights and wears dark glasses day and night. “The normal feeling in my eyes is like when wind blows grit in your eyes on a hot summer day,” she explains.

She also lacks energy and can no longer eat the spicy food she used to enjoy because it burns her mouth and throat. “Before, she used to eat the hottest peppers,” recalls Joseph. “Now we give away most of the ones we grow.”

The scars of TENS, according to Dr. Shear, are actually on the inside. “Patients rebound but become very anxious. Almost always, survivors suffer from post-traumatic stress disorder, and it’s also traumatic for the family.”

He adds, “There is a tremendous sense of fear of future illnesses and the potentially frightening prospect of the unknown risks from any drug. This affects the survivor and their loved ones.”

For Sonia, rebounding from the disease has taken a positive direction. With encouragement from Dr. Shear, she has become a crusader for SJS/TENS awareness and support for patients.

“I want to mobilize the survivors and bring hope to SJS/TENS patients,” says Sonia. “They can heal. They can be beautiful again.”

“We would like to share our management, experience, and present our treatment protocol to help guide treatment of these complex patients, not only in Canada but also worldwide,” Dr. Shear and his colleagues explained in the protocol document.

The protocol is designed to prevent further decline, heal debilitating symptoms and provide supportive care.

Recommendations for supportive care include increasing the temperature in the patient’s room to 30-32°C, applying white soft paraffin to the lips every two hours and a topical steroid four times daily, along with oral rinses, including lidocaine for pain.

Fluids are replaced intravenously, along with pain medication, while appropriate nutrition may be provided through a feeding tube through the nose.

Involving an ophthalmologist and a gynaecologist or urologist as soon as the diagnosis is made is also important.

According to the protocol, daily follow-up by an ophthalmologist is essential. Eyes are treated with artificial tears, lubrication, topical antibiotics and steroids and, when necessary, daily sweeping of the inside of the eyelid with glass rods to prevent it from sticking to the eye itself.



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## Second chances

An innovative surgery helps a young quadriplegic man realize his dream to play on Canada's wheelchair rugby team

BY MICHELE SPONAGLE

There was no question about what was at stake for Eric Furtado-Rodrigues. He became a quadriplegic after a 2009 snowboarding accident in Spain where, following the accident, surgeons there implanted a titanium plate to repair his spine. He returned to Canada, but with time the plate shifted, causing a three-by-two-centimetre hole between his spine, esophagus and trachea. By 2015, Eric was having trouble swallowing food and experiencing recurrent infections.

Eric now needed a feeding tube and a tracheostomy tube, which made it difficult to speak and impossible to eat or drink anything by mouth. He wanted the best quality of life possible, something he expressed profoundly to Dr. Danny Enepekides, Sunnybrook's otolaryngologist-in-chief and chief of surgical oncology.

At just 37, Eric still had much

**above:** Patient-doctor trust and mutual respect helped Eric Furtado-Rodrigues achieve his goal of becoming a member of Canada's wheelchair rugby team.

to achieve. He would push his doctors to think outside of the realm of possibility, so that he could once again do the simple things that used to bring him joy, from being a world-class athlete to enjoying fine food, including his wife's cooking. To get Eric to that place, Dr. Enepekides and his colleagues were inspired to do everything they could.

They would need to repair the hole and perform intricate microsurgery to mend his damaged trachea. It was a challenging prospect. "If the procedure failed, I would make him worse," says Dr. Enepekides.

One of Eric's goals was to earn a spot on the Team Canada Wheelchair Rugby Team. His high expectations, determination and optimism inspired Dr. Enepekides to think of ways to get this young man back to playing sports again.

Over multiple appointments (30 to 40 in total leading up to the surgery), a deep relationship – one marked by trust, caring and mutual respect – formed between doctor and patient.

"When I met Eric, my heart went out to him, his wife, Susana, and his family," recalls Dr. Enepekides. "He is a genuine person. Despite all of the challenges he faced, he always had a very positive attitude. He was full of life – very inspirational."

Eric was confident that Dr. Enepekides could successfully repair the hole in his trachea surgically. "At that point, I was fed up," recalls Eric. "I had nothing to lose. My quality of life wasn't good. And even though [the surgery] had never been done before, I just had a good feeling everything would work out."

It took almost a year to plan the surgery. Dr. Enepekides and

his surgical colleague, Dr. Kevin Higgins, spent countless hours meticulously mapping out every step of the procedure to mend the hole that was causing so many problems for Eric. In the back of their minds was the fact that Eric wanted to pursue his love of athletics once again and compete at an international level.

Both doctors understood there was a lot riding on the success of the surgery and they had never seen a case where there was so much damage. After much analysis, Dr. Enepekides believed he had a solution that would work to fix Eric's cricoid (the ring-shaped cartilage around the trachea that also forms part of the voice box) and save his larynx. He would harvest a small amount of tissue from the patient's scalp and transplant it to repair the hole in the cricoid.

"It's an area that is quite tricky," explains Dr. Enepekides. "Because of where he was injured, the option most likely to succeed would have been to remove his voice box. If I did that, he would lose his ability to speak. Instead, I opted for techniques I've used before in cancer surgeries."

One of those techniques was the use of a fluorescence imaging system, a high-tech tool that allows physicians to visualize microvascular blood flow. Patients are injected with the special dye indocyanine green (ICG), which causes blood vessels to glow brightly when exposed to a laser beam attached to a digital camera recording how and where the dye is moving. It's invaluable to surgeons looking for a highly detailed map of a patient's vascular system.

Sunnybrook's fluorescence imaging system was donated by a former patient to the Division of Plastic Surgery. Though the imaging system is often used in breast reconstruction, the surgical team was able to take a customized approach and utilize it in Eric's procedure.

"The system helped increase our confidence going into his surgery," says Dr. Enepekides. "It

is a very useful tool."

On the day of the surgery, Dr. Enepekides had covered the wall of the operating room with a large chart, precisely outlining each step of the surgery to ensure its success. It took more than 10 hours to complete the intricate procedure that included splitting Eric's voice box to get to his trachea. Now, it was watch and wait, allowing time to heal.

At Eric's follow-up appointment with Dr. Enepekides, the question remained if Eric would be able to drink and eat normally again. While his feeding tube and trach tubes were still in, a barium swallow suggested the hole had been sealed and both were feeling optimistic.

Dr. Enepekides handed him him a glass of water and asked him to take a sip. Eric held the cup to his lips, then drank. He was able to swallow for the first time in nearly a year and a half.

"[The water] felt so cool going down," he remembers. "It was the best feeling. Dr. Danny and I just looked at one another and we smiled."

Post-surgery, Eric was able to enjoy eating again. He remembers his first full meal after the surgical procedure fondly – Susana's homemade shepherd's pie. Once he had finished healing,

**below:** Dr. Danny Enepekides (left) and Dr. Kevin Higgins successfully innovated a surgery that had never been done before, which restored Eric's ability to eat and drink.

he was able to focus on earning a spot on Canada's wheelchair rugby national team.

When he was selected in March 2017, one of the first e-mails Eric sent out was to Dr. Enepekides. "I'm officially a member of the team!" it said and included a photo of himself in action at the tryouts. Dr. Enepekides still has that message.

Eric has been attending rugby training camps in preparation to compete at the 2018 Wheelchair Rugby World Championship of the International Wheelchair Rugby Federation (IWRF), to be held in August in Sydney, Australia. Says Eric, "There's no way I'd be doing what I am right now without what Dr. Danny did for me. He's a special guy. I've dealt with a lot of doctors throughout this experience and he is in a class of his own. I was so fortunate to be taken care of by him and such an incredible team."

Meanwhile, Dr. Enepekides and his team continue to use the knowledge gleaned from Eric's surgery for other Sunnybrook patients.

"I was incredibly thankful to be able to help Eric," notes Dr. Enepekides. "It was one of the most rewarding things I've ever experienced. He reminded me why I do what I do." 🐾

PHOTOGRAPHY BY DOUG NICHOLSON

PHOTOGRAPHY BY KEVIN VAN BRASSEN





## A complex composition

*Sunnybrook's novel surgical procedure for treating rectal cancer is being adopted by a network of specialists*

BY SHANNON MONEO

**A**fter a close friend of Michael White's died of rectal cancer in his early 50s, the disease, which for some has few warning signs, preoccupied Michael's mind. "It was so horrific to see my friend die," he recalls. "I didn't want to go through that."

A composer in Toronto who creates music for Hollywood films and television, Michael is a 57-year-old father of two adult children. He had done two tests to check for hidden blood in his stools, which could be a sign of

cancer, and they showed no signs of trouble. But in July 2016, he had a colonoscopy that revealed a rectal tumour.

Michael was soon referred to Dr. Shady Ashamalla, a surgical oncologist at Sunnybrook's Odette Cancer Centre and a Canadian pioneer in the use of minimally invasive surgery for rectal cancer. "Dr. Ashamalla was really direct with me," he recalls. "He never sugar-coated anything, but I never doubted he could do it."

At Sunnybrook, distinct patient-centred protocols that improve outcomes for cancer patients like Michael are being developed and finessed. "We strive to minimize the impact of our medical intervention on patients' lives," Dr. Ashamalla explains. "The goal is to treat and cure the patient and do it in the least invasive way possible. Minimally invasive surgery is not just a technique we employ with advanced instruments; it's a complete philosophy of care."

If Michael had cancer surgery just a few years ago, the experience would have been completely different. The pain and recovery time would have been greater because a long incision would have been made in his abdomen to reach and remove his rectum, leaving him with a permanent colostomy.

For Michael's surgery in October 2016, Dr. Ashamalla used what's known as TaTME – transanal total mesorectal excision.

In this procedure, used for large rectal cancers, the surgeon removes a portion of the rectum through the anus and then reattaches the colon to the remaining rectum or anus to make a new connection. It's all done through transanal laparoscopic surgery, which avoids incisions, offers greater accuracy during surgery, and is safer for the patient. The procedure also speeds up recovery time.

"If I'd have had the old surgery, I would've been in the hospital much, much longer," Michael says. Following the six-hour surgical procedure, he spent four days in hospital. One week later, he was walking 30 minutes each day. Three weeks later he had returned to the recording studio where his co-workers had no inkling he had undergone cancer surgery. And after three and a half months, he was back on the ice, playing hockey.

"The procedure not only saved my life, it saved my quality of life," he says.

Dr. Ashamalla's history with this minimally invasive technique



started in 2014 after he read about the new rectal cancer treatment being done in Europe. The same year, he went abroad to further his training in the procedure, which was developed by a Spanish doctor, Antonio de Lacy. In spring of 2015, Dr. Ashamalla performed his first procedure and, since then, he and his Sunnybrook team have performed more than 150 of the procedures.

"We kept track of all of our outcomes and quickly realized the results were superior," he says. "What was an 8- or 10-day hospital stay became a three- or four-day stay but, more importantly, by minimizing the impact

**above:** Minimally invasive surgery is not just a technique, says surgical oncologist Dr. Shady Ashamalla. "It's a philosophy of care."

**opposite page:** Toronto composer Michael White was back in the recording studio, just three weeks after undergoing a cutting-edge procedure for cancer treatment.

of the surgery we were able to get patients back to their normal quality of life much quicker."

Recognizing the value of shorter hospital stays and improved results, Dr. Ashamalla and his team pushed the procedure forward. "We were thinking about the big leap – new equipment, new nursing training, raising the capital investment. I felt very fortunate at the time to be supported and empowered by Sunnybrook to grow and implement cutting-edge technology, despite the initial investment," Dr. Ashamalla recalls.

But as with many novel, and promising, surgical procedures, there must always be balance be-

## FAST FACTS ABOUT COLORECTAL CANCER (CRC)

### Signs and symptoms

- blood in or on the stool (either bright red or very dark in colour)
- a persistent change in normal bowel habits for no reason, such as diarrhea or constipation or both
- frequent or constant cramps lasting more than a few days
- stools that are narrower than usual
- general stomach discomfort (bloating, fullness and/or cramps)
- frequent gas pains
- a strong and continuing need to move one's bowels, but with little stool
- a feeling that the bowel does not empty completely
- weight loss for no known reason
- constant tiredness

### Risk factors

There is no "single cause" for developing CRC, but there are some people who are considered to be at higher risk than the general population:

- those with a family history of CRC (If you have a first-degree relative, such as a parent, sibling, aunt, uncle, grandparent, with CRC, you should get tested 10 years before your relative's age of diagnosis)
- those who have already been diagnosed with polyps or early-stage CRC
- those who have inflammatory bowel disease (ulcerative colitis or Crohn's disease)
- those with a family history of inherited breast cancer, uterine or ovarian cancer
- middle-aged people (50 years and over)

Courtesy of Colon Cancer Canada and the Canadian Cancer Society

tween spreading the new training widely to other surgeons while absolutely ensuring patient safety. "The question became: How do you disseminate it [the procedure] widely? How do you train surgeons to do an operation that is better for patients while making sure the quality is not compromised during their learning curves?" Dr. Ashamalla notes.

"At Sunnybrook, we are national leaders in bringing new techniques to the country, and by extension we must be leaders in safely disseminating that knowledge as broadly as possible," he says.

**'We are getting to the point where we can really start to revolutionize rectal cancer care.'**

**Dr. Shady Ashamalla**  
Surgical Oncologist  
Sunnybrook's Odette Cancer Centre

Proctorship became key. In June 2016, Dr. Ashamalla organized the first Canadian conference on transanal total mesorectal excision in Toronto. Eleven international experts introduced the procedure to more than 250 rectal surgeons from every Canadian province.

That initial gathering led to the formation of the Canadian TaTME Proctorship Network. Since then, the network, in partnership with the University of Toronto, has been offering a one-day proctorship course that teaches rectal cancer surgeons each step of the procedure and allows them to technically practise it. "The whole concept was to develop a

model for a rigorous structured introduction of innovative surgical techniques," Dr. Ashamalla explains.

After the course, the network can link the surgeons to proctors who are geographically closest to allow them to observe transanal total mesorectal excision surgeries with the proctor and subsequently be coached through their initial cases. Because the surgical procedure is very technically challenging, only doctors who do a high volume of rectal cancer surgeries are suitable. Specialization is crucial. "We know that volume and outcomes are linked," notes Dr. Ashamalla.

As Sunnybrook's chief of surgical oncology, Dr. Danny Enepekides supports the proctorship program. "This procedure is not something a novice can pick up after a day and then start doing. It is an advanced technique," he notes.

As minimally invasive surgery becomes the future, such advanced techniques require more than a day or two of training, Dr. Enepekides says. In the case of transanal total mesorectal excision, as surgeons become skilled at the procedure, they then become proctors. "We're looking to continually build a network," he says.

Approximately 80 surgeons have taken part in Dr. Ashamalla's proctorship sessions thus far. Some are ready to bring this minimally invasive surgery to their city hospitals while others continue to learn. "This procedure is a game changer for rectal cancer," Dr. Ashamalla says. "We are getting to the point where we can really start to revolutionize rectal cancer care."

For Michael, the value of the procedure is his life. While he is not burdened by a colostomy or required to consume heavy-duty post-operative drugs, his follow-up care does include CT scans and colonoscopies. In November 2017, Dr. Ashamalla performed a routine colonoscopy on Michael. "Everything was okay," Michael reports. ☑

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## Changing the conversation

Research is showing that the way the media talks about suicide can save lives

BY DONNA YAWCHING

For Dr. Mark Sinyor, a crucial part of suicide prevention has to do with communication.

“We are trying to find ways of getting the truth out,” he says, “rather than the many misconceptions about suicide that have been perpetuated for a very long time. People want to understand suicide and what is to ‘blame,’ but we need to resist simplistic answers like the historical notion that suicide is the result of a single life stressor. Unfortunately, suicide is sometimes depicted as an inevitable outcome, with a de-emphasis on the role of treatable mental disorders. But none

of this is the case at all.”

A staff psychiatrist with Sunnybrook’s Department of Psychiatry, Dr. Sinyor points out that people with mood disorders – depression and bipolar disorder – account for more than 50 per cent of all suicide deaths.

“There is no reason that anyone needs to die from suicide,” he says. “Suicidal crises are often fleeting and there are many ways in which we can intervene to help people through them. In virtually all cases, they are accompanied by a treatable mental disorder. Every suicide death is a tragic missed opportunity for someone

to have gotten help.”

Timely care for the underlying disorder can be the key to preventing most of these tragedies.

Colin is one of Dr. Sinyor’s patients – and a case in point. For years, Colin’s bipolar condition remained undiagnosed. To all outward appearances, he appeared to be doing fine.

“Life is not only what happens on the outside,” says Colin, 29. “I was in pain all the time. I didn’t tell anyone at first that I was suicidal. I put on a good face, but I was crying when I was alone.”

After several suicide attempts, visits to multiple psychiatrists and a variety of medications, a friend’s intervention led Colin to Sunnybrook and a course of treatment under Dr. Sinyor’s supervision.

“I owe Sunnybrook my life,” says Colin.

That was over two years ago. Colin has since gotten married and now works at a job that he finds satisfying. He wants nothing more than to “stay like this – stable,” he says. “I know it’s going to

be a struggle, but I’m surrounded by good people. I’m a lucky guy.”

His message to others like himself? “Reach out for help. Just do it.”

The stigma of mental illness continues to hinder treatment, which motivated philanthropists Glenn and Stacey Murphy of Toronto to donate \$10-million to create the Murphy Family Centre for Mental Health at Sunnybrook. This new state-of-the-art inpatient facility will treat those with severe mental illness, including patients like Colin with mood and anxiety disorders. It will use a collaborative approach that frames mental illness as a disease like any other to reduce stigma and encourage treatment.

Colin’s case is the type of positive story Dr. Sinyor would like to see highlighted more often in the press. A scientist with the Hurvitz Brain Sciences Program at Sunnybrook, Dr. Sinyor cites research showing that the way the news media reports on the topic may significantly affect rates of suicide – and attempted suicide – in wider society.

“Suicide contagion” is a very real phenomenon. “When news reports are published emphasizing suicide methods or the

inevitability of suicide, sadly, we see more suicide deaths,” Dr. Sinyor explains. “But the opposite is also true – resilience is also contagious. Research from Europe shows that when the media broadcasts stories like Colin’s, you see fewer suicide deaths afterwards.”

He notes that people are apt to identify with people depicted in the media they consume. “It is a fact that too many people still do die by suicide, but far more find ways to overcome it, and if you only publish stories about deaths, you’re sending a skewed picture to everybody – and a potentially dangerous picture. Our goal is to help shift things in a positive direction.”

Dr. Sinyor is currently creating a structure for collaboration between mental health professionals and journalists to better “inform the public in a way that sends accurate messages,” he says. “We’re not trying to censor journalists or tell them how to do their job,” notes Dr. Sinyor, who is the lead author on the Canadian Psychiatric Association’s updated media guidelines on suicide reporting. “Journalists need to be independent.”

Still, he believes more effort

could be made to “create context” when reporting on suicide and to convey the key truths on the issue – that suicide is preventable, that there are other means of coping with life’s stresses, and that the vast majority of people who have suicidal thoughts never follow through. In short, suicide is not inevitable even when life appears hopeless.

“Journalists have a lot of power to influence the way people think and, to an extent, behave,” he says. “They need to exert that power in a way that’s safe and helpful. We are just trying to be a resource that they can call on for guidance.”

Ultimately, Dr. Sinyor would like his message to be a positive one. He points out that suicide rates in Toronto and in most westernized countries – the U.S. is the exception – have declined significantly in recent years.

“People are more willing to seek help,” he says, “and resources are increasing. It’s not all doom and gloom and people need to understand that. We’re making a dent. We need to decrease the stigma of these disorders, increase people’s ability to seek help, and send the message that there is hope.”

### PREVENTING TRAGEDIES WITH BETTER ACCESS TO CARE

Often with young suicides, there is a rush in the media to identify a “cause,” such as bullying. Sunnybrook researchers, however, are confirming that the narrative is much more complex.

According to Dr. Mark Sinyor – lead author of a 2014 study of bullying as a contributing factor in youth suicide in Toronto – it’s a “myth” that youth suicides are caused by one specific event or setback in a young person’s life.

“Bullying by itself does not kill teens – full stop,” he says.

The study found that mental illness is “a significant contributor” to youth suicide, often in combination with psychosocial stressors like bullying or substance abuse. Bullying was in fact relatively low (6.4 per cent) on the scale of stressors identified as affecting the 94 youth suicides included in the study, compared to depression in 40 per cent of the cases, or conflict with parents (21.3 per cent).

Noting the crucial importance of social contagion in impressionable young people, Dr. Sinyor cites another study, conducted at the University of Ottawa and published in 2013. In examining the association

between exposure to suicide in a classmate and suicidality outcomes in youth, the study showed that if a teenager learned of another teen’s suicide, the risk of thinking about or even attempting to take one’s own life was two to six times higher, even if the teen did not personally know the victim.

Simply knowing that someone else in their peer group had died conferred a risk.

However, the factors leading to these tragic events should not be oversimplified, Dr. Sinyor advises. “Suicide is complicated and the stressors that often contribute in youth – such as romantic breakups, problems at school, problems with the

law and bullying – all have in common that they can cause youth to feel a deep sense of shame and a disconnect from others,” Dr. Sinyor says. “All youth will experience some of these problems at some point and will have to cope with the distress that they cause. So, the focus shouldn’t be on eliminating distress but on teaching resilience. We need to message resilience rather than hopelessness.

“We need to send a message to youth that they can overcome stress with the appropriate tools, and we need to provide resources – including timely access to mental health care – to those who are struggling.”



## Scratching the surface for penicillin tolerance

*Bedside skin allergy testing standard practice at Sunnybrook*

BY BARBARA BALFOUR

After breaking out in hives all over her body, following complications from a difficult pregnancy, Marjorie Wall refused to take penicillin again for 40 years.

But when a severe infection developed during recent back sur-

gery, her doctors at Sunnybrook asked her to consider bedside allergy testing in case the allergic reaction had changed.

"They told me they really wanted to try penicillin because they had found several strains of bacteria in the incision, recalls Wall,

71. "Other kinds of antibiotics they had tried weren't working."

"They came in to do a scratch test on my arm, which didn't react. Then they put me on an IV with a penicillin-based antibiotic, which I was on for the next nine weeks without any issues.

"Now I take them orally twice a day for the rest of my life. All these years, I thought I had an allergy to penicillin but [I didn't]. It was actually penicillin that made my surgery a success."

The bedside skin testing Marjorie received is part of a study of seriously ill patients with life-threatening infections that are best treated with penicillin, otherwise known as beta-lactam.

This study on beta-lactam allergy skin testing (BLAST) is the first of its kind. Led by

Dr. Jerome Leis, medical director of Infection Prevention and Control at Sunnybrook, the BLAST study was conducted in three hospitals. It found that more than 80 per cent of patients with a penicillin allergy were able to tolerate the drug without serious complications.

Like Marjorie, one in 10 Canadians report having an allergy to penicillin. "At some point in their lives, they may have been misclassified as having an allergy, when in fact their reaction was due to other reasons," says Dr. Leis. "Many people outgrow it or are now able to receive the drug without the same initial reaction.

"We've known for a while that patients who report an allergy to penicillin actually have worse clinical outcomes. They might have infections that are more difficult to treat, while the alternatives they get treated with are associated with more toxic side effects or a greater risk of developing more antibiotic-resistant organisms."

The ongoing study, published last October in *Clinical Infectious Diseases*, is expanding to include 10 hospitals across Ontario and western Canada and is part of a larger strategy on curbing the epidemic of antibiotic resistance. BLAST is now part of standard practice at Sunnybrook.

"We are not talking about antibiotic resistance enough. This is a major health crisis," notes Dr. Leis. "Current worldwide estimates of deaths attributed to untreatable infections directly from antibiotic resistance are at about 700,000 a year. At our current rate of antibiotic overuse and without the development of new drugs, by 2050 that number is expected to rise to 10 million deaths worldwide. This is more than what we see from cancer today."

To effectively combat such alarming figures, Canada's approach needs to include a strategy for safely using penicillin, says Lesley Palmay, study co-author and clinical coordinator of infectious diseases in the Pharmacy

Department at Sunnybrook. "Allergies are troublesome because they limit our ability to prescribe optimal medications. For infectious diseases practitioners and pharmacists, the penicillin-based antibiotics are our workhorses," she says.

While it's only physicians who have historically conducted skin allergy tests, pharmacists were also trained to administer them during the study and may eventually lead this activity in hospitals as part of their expanding role in Ontario.

"As pharmacists, we are well versed in taking a thorough allergy and medication history, [and we] know what anti-microbial treatments are required and remain a core part of the team, especially in teaching hospitals where physicians rotate through regularly," says Palmay. "In this setting, the pharmacist is the one constant member that stays on as part of the infectious diseases team.

"Our approach to being more collaborative, systematic and questioning of antibiotic allergies is crucial in our fight to combat antibiotic resistance in Canada." 📧

## TEST AHEAD OF TIME

Think you may have an allergy to penicillin? Ask your family doctor to review your history and decide whether you are a candidate for allergy testing.

Over the past two years in the Drug Safety Clinic at Sunnybrook, 97 per cent of the 1,500 outpatients tested for penicillin allergies turned out to be no longer allergic.

"Patients need to know that declaring an allergy to penicillin means being denied more than 20 drugs from their arsenal of potential treatments. A lot of doctors will hesitate to give anything related to penicillin if there is even a sniff of a reaction," says Jackie Campbell, a drug safety pharmacist at the clinic.

Testing involves surface skin testing, followed by oral administration of a penicillin antibiotic over the course of six hours in the Drug Safety Clinic at Sunnybrook.

For more information, visit [drugsafety.sunnybrook.ca](http://drugsafety.sunnybrook.ca).

**below:**  
Dr. Jerome Leis, medical director of Infection Prevention and Control at Sunnybrook, is leading a groundbreaking study on penicillin intolerance to address issues around antibiotic resistance, which he describes as "a major health crisis."

**opposite page:**  
All her life, Marjorie Wall believed that she was allergic to penicillin, but a new allergy skin test developed at Sunnybrook proved otherwise.



PHOTOGRAPHY BY MEG WALLACE

PHOTOGRAPHY BY KEVIN VAN PRAASSEN



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## Training day

*Sunnybrook doctors are bringing life-saving skills to first responders and the public*

BY PATRICIA HLUCHY

**N**ancy McClure, a customer care co-ordinator with Metrolinx, is tightening a tourniquet around the white-shirted arm of her colleague Gobi Ravinthiran, who holds the same position with the Greater Toronto Area/Hamilton public-transit agency. Amid laughter, she asks him three times if it hurts – it does, as it's supposed to – and then tries to distract him by saying, “Look at your bicep!”

**above:** Participants at a Stop the Bleed course, which teaches first responders how to deal with uncontrolled bleeding in trauma victims.

Nancy is practising a technique she has just learned in Stop the Bleed, a two-hour course offered at Sunnybrook to teach first responders and people who work in large public spaces, as well as the general public, to deal with uncontrolled bleeding, which is one of the most preventable causes of death from trauma outside the hospital setting.

She was among 100 Metrolinx employees taking the morning

session; another 60 attended in the afternoon. “We see all kinds of things at Union Station,” says Nancy, 30, of the workplace she and Gobi share. “It makes a big difference if you’ve been prepared and you know what to do.”

Stop the Bleed started in the U.S. in the wake of the shooting in 2012 at the Sandy Hook Elementary School in Newtown, Conn., when 20 students, aged 6 and 7, and six adult staff were killed.

PHOTOGRAPHY BY KEVIN VAN PRAASSEN

That tragedy led to the Hartford Consensus, a strategy created by health-care and government leaders who met in Newtown and which recommended, among other things, that more people should learn how to treat uncontrolled bleeding.

When Dr. Avery Nathens, Sunnybrook's surgeon-in-chief, heard about Stop the Bleed, he committed himself to bringing it to Canada. He found a ready partner in Sharon Ramagnano, manager of trauma services at Sunnybrook. In May, the two travelled to Chicago to learn more about the program from the American College of Surgeons, for which Dr. Nathens is the director of the Trauma Quality Improvement Program (TQIP).

Soon after, they taught 12 Sunnybrook staff members to be Stop the Bleed instructors; there are now 26 instructors among Sunnybrook staff. So far, besides

*below:*  
Sharon Ramagnano, manager of trauma services at Sunnybrook, and Dr. Avery Nathens, surgeon-in-chief, train hospital staff to become Stop the Bleed instructors for the larger community.

Metrolinx, the course has been presented to about a dozen City of Toronto events staff in the lead-up to Nuit Blanche, the city's annual arts celebration in the fall.

"I thought ultimately this was a necessary thing to bring to Canadians," says Dr. Nathens, who is also a senior scientist of Sunnybrook Research Institute's evaluative clinical sciences platform and its Trauma, Emergency & Critical Care (TECC) research program. "We've been relatively immune thus far from mass shooting events, but likely this is going to come to us at some point. And the skills that can be acquired through the bleeding control course are not necessarily just specific to gunshot wounds. It might be a motor-vehicle crash, it might be a bike accident." Dr. Nathens also points out that without proper intervention, people can "bleed out in minutes," dying well before the arrival of Emer-

gency Medical Services (EMS).

There are similarities between the program and CPR training, according to Dr. Nathens and Sharon. "Our thought was, [controlling bleeding] is just as simple; however, it's not recognized as the first thing for people to do," says Sharon. The course teaches participants how, after calling 911, they can stop uncontrolled bleeding – in a limb by using a tourniquet, and in a limb or the trunk of the body by packing wounds with gauze or another material and then applying pressure until help arrives. One hour of the Stop the Bleed program is devoted to hands-on practice involving a partner and then a fake limb.

Trainees are taught not to focus on possibly introducing bacteria into someone's wound when applying pressure or packing. Instead the focus should be on the life-saving technique they are doing to help them make it to a trauma centre where the medical professionals can fix their injuries and any complications.

When Toronto hosted the Trauma Association of Canada's annual meeting in February this year, Sunnybrook taught health-care practitioners from across the country how to be instructors for Stop the Bleed. Sharon also coordinated efforts for training to be offered in the GTA by contacting malls and other public places where masses of people typically gather.

Upon learning about Stop the Bleed, Steve Harvey – manager of operational support for Metrolinx's safety and security division – quickly arranged for Metrolinx employees to attend the program. "Things can happen that create trauma for people, and it doesn't necessarily have to be a terrorist act," says Steve. "It could simply be a massive motor-vehicle collision. And don't forget that downtown, there's a significant amount of construction going on. If we have people available on the ground who have skills to help people survive, to me that's a win." 🍀



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## Up to par

*Long-standing golf tournament was 'never just about the golf,' says founder*

BY WENDY GLAUSER

Over a decade ago, for deeply personal reasons, Michael and Marilena Latifi committed their support to the launch of the visionary Women & Babies Program at Sunnybrook. Then, years later, the family was blindsided when their son came home partway through his semester at university and revealed some troubling news.

It led them down a path that was sometimes uncertain and overwhelming, and inspired the couple to once again throw their support behind a new state-of-the-art Sunnybrook program, this time in mental health care.

This summer marks the 11th annual Sofina & Amici Golf Classic, a family-friendly golf tournament that was founded by the Latifis and has raised more than \$3.7-million. The success of the event stems from their “grab-life-by-the-horns” philosophy, and they have used their own challenging experiences in health care to inspire their philanthropy.

Each year, the tournament has grown, with 2017's event raising another record high amount. “When we started, it was unthinkable that a one day-event of 18 holes of golf could generate half a million dollars,” says Michael, Founder, Chairman and CEO of the Markham, Ont.-based Sofina Foods Inc.

The event has become so

popular that there's a waitlist of golfers (the event accommodates 144 players). From celebrity chefs to the nightly entertainment and signature cocktails, the planning for every indulgent detail of the event begins a whole year in advance. As Michael says, “it was never just about the golf.”

In 2008, Michael and Marilena launched the tournament in support of Sunnybrook's Women & Babies Program. The Latifi family shared Sunnybrook's vision on how to promote baby-parent bonding when babies require incubators.

When Michael Jr. was born in Montreal, the stress of the long and difficult labour meant he needed to stay in an incubator for a couple of days immediately after the birth.

The Latifis had to view him through glass in a room with 20 other babies in incubators. Four children later, the Latifis toured the Aubrey & Marla Dan Centre for Women & Babies, which offered comfortable rooms, each with its own incubator. “It made me want to have another one,” jokes Marilena.

Then, five years ago, Michael Jr. inspired a new cause for the Latifis' drive to give back. Partway through his semester, he came home unexpectedly, overwhelmed with anxiety and depression. He was afraid to be alone. He could barely muster up the energy to go upstairs to his bedroom. He was afraid to drive somewhere unfamiliar to him.

“He thought the worst thing in the world could happen to him if he got lost,” recalls his father. “Mental health issues prevent people from doing normal everyday things. They're as debilitating as severe physical diseases.”

The Latifis contacted their family doctor and were referred to different specialists but were given conflicting advice. “There are so many aspects to navigate,” explains Michael. “How do you guide [patients]? How do you help them learn when there may be learning difficulties involved?”

The Latifi family's experi-

ence inspired them to support Sunnybrook's Family Navigation Project. The program connects families with trained health professionals who navigate them to the most appropriate counselling groups, health-care options and social and educational services in the mental health and addictions system for youth.

Thanks to the all-in support from his family and community and a customized treatment plan provided by his medical team at Sunnybrook, Michael Jr. made an inspiring recovery.

Just how inspiring? Well, when Michael Jr. was invited to take part in the 2014 RBC Race for the Kids, a signature annual event that raises money for the Family Navigation Project, he set a goal of not only raising the most money, but also winning the 25k race, which was only a couple of months away. Though overweight at the time and not a runner, he accomplished both goals. Fellow competitors asked him how many years he'd been running. “He said, ‘I just started.’ They were floored,” recalls Marilena. Michael Sr. was so inspired he ran the 25k in solidarity.

The challenge was so affirming for the young Michael that he moved on to Tough Mudder obstacle mud races, and then to the Ironman triathlon, considered the most difficult one-day endurance competition in the world. Having won the Ironman for his age group in Panama City, Florida, Michael Jr. will compete in the prestigious Ironman World Championship in Hawaii this October.

It would be easy for the Latifis to put their son's mental health struggle behind them, but they want to use their family's experience to help others.

“Mental health is something you have to nourish all the time,” notes Marilena. While the Latifis initially reacted with disbelief and confusion at their son's outpouring of his inner struggles, they quickly understood how serious mental illness is and how little it's understood, even by parents.

*opposite page:* Marilena and Michael Latifi are longtime supporters of Sunnybrook, through their annual Sofina & Amici Golf Classic.

“When a child is sleeping all day, most parents think, My kid is lazy,” says Michael. “[But maybe] the kid is depressed.”

Michael Jr. now speaks at schools and fundraisers and, in doing so, inspires others to reach out. When the Latifis hosted a fundraising event in their home for the Family Navigation Project, they were stunned at the number of high-profile executives coming to them afterward to speak about family members struggling with depression, addiction and homelessness.

“We say that it shouldn't be taboo, but to actually take that leap of faith and speak personally takes tremendous courage,” says Umeeda Madhany, a family friend of the Latifis. She is the head of the Sofina Foundation, which is the charitable arm of Sofina Foods Inc.

But facing situations head on and then going all in is typical of the Latifi family.

Michael credits his personal and professional determination to his upbringing as a refugee. He fled Iran with his three other siblings when he was 15.

“We all got jobs at McDonald's,” he says.

He went on to complete a degree in electrical engineering and an MBA at McGill University and built Sofina Foods into the third-largest food company in Canada.

Michael and Marilena are strongly committed to their community, and so are their children, who help with the long days of preparation that go into the Golf Classic. It was natural for the family to direct their passion toward the challenges of difficult births and mental health struggles that are common to so many, and that they experienced firsthand.

Choosing Sunnybrook, which is leading scientific discovery and teaching health providers across Canada in improved obstetrical and mental health care, was an easy decision.

“We're blessed that we can give back,” says Michael, “and we want to do more.”

# SIGNED, SEALED AND DELIVERED

The seamless system of Sunnybrook's pharmacy services

When it comes to medications, patients are likely unaware of the level and complexity of training, care and time involved. The members of Sunnybrook's Inpatient Pharmacy Services team work closely together to get medications custom-prepared, meticulously checked, uniquely barcoded, securely packaged and then delivered on time.

These pharmacists and pharmacy technicians – all certified by the Ontario College of Pharmacists – manage and prepare medications daily for more than 500 patients at the hospital's main Bayview site. They also monitor medications for

patients in specialized rehabilitation at St. John's Rehab and for residents in long-term care at the Veterans Centre.

"We provide a vital medication distribution service to the hospital. We're part of the care team. Our expertise helps ensure that patients are taking the most suitable medications at the different stages of their care," says Scott Walker, director of Pharmacy Services. "And because we know it helps patients to adhere to their medications once they get home, we counsel them on how they should take them, manage dosages and avoid potential side effects."



## SAFE HANDLING AND STORAGE

Some medications are toxic to staff and to patients who have not been prescribed those products. To minimize exposure, many of these medications arrive at Pharmacy Automation, already individually packaged by the pharmaceutical suppliers. At Sunnybrook, to ensure safe handling, each medication is sealed with overwrapper, barcoded and then hung on storage pins in a large dispensing robot along with other robot-ready packaged medication.

The robot has a mechanical arm with a sensor. The arm reads the barcode of the medication that links to an individual patient's file number and medication order. Using sensitive suction cups, the robot then gently pulls a day's worth of medication off the pin for each patient before placing the medications into a dedicated bin.

## MEDICATION ORDERS, CHECKS AND BALANCES

When patients arrive at Sunnybrook, Inpatient Pharmacy Services gathers data about their medications, using information from a range of sources as well as a careful interview with the patient. Known as a Best Possible Medication History (BPMH), this procedure gives valuable context on how patients' medications will be ordered by their physicians and managed.



## A PRECISE PROCESS

Approximately 90,000 orders are downloaded every month, with pharmacy technicians carefully packaging medications according to the medication orders in each patient's file.

Full-dose tablets that are safe to handle, such as ibuprofen, are packaged using a gravity-feed machine that drops each tablet into a clean single-pocket bubble pack that is then sealed.

Medications given to patients by intravenous methods or by injection must be sterile, and these are prepared and packaged by specially trained pharmacy technicians.



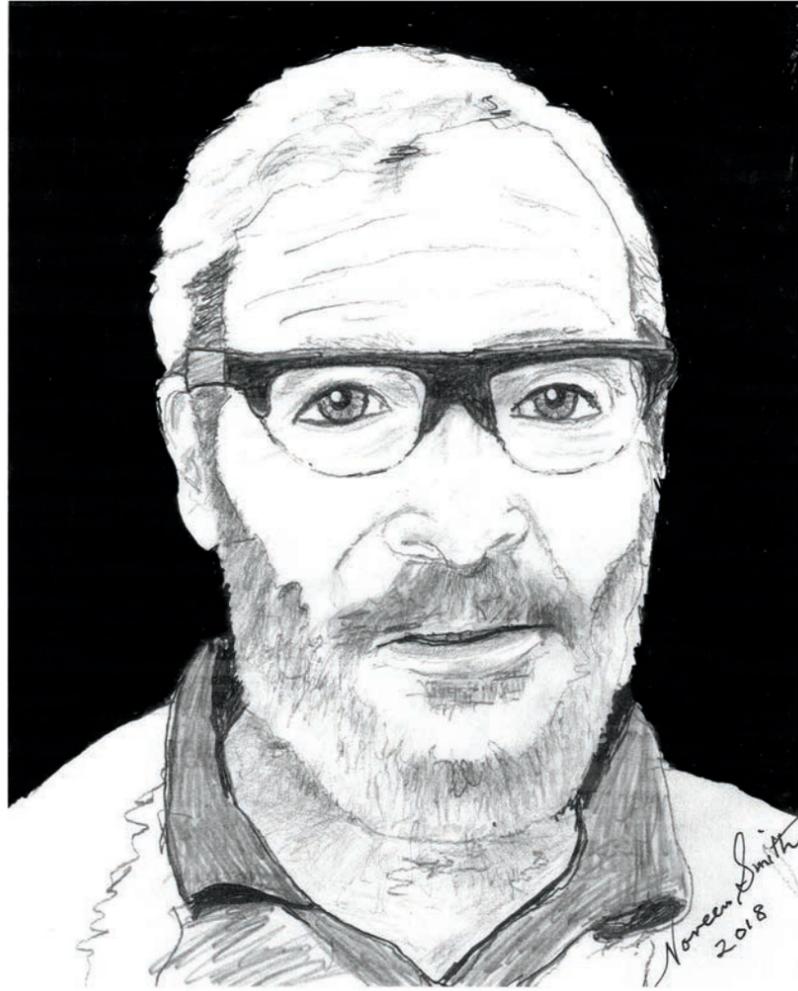
PHOTOGRAPHY BY KEVIN VAN PAASSEN



## PROMPT DELIVERY

Medication bins are then taken to satellite pharmacy locations in the hospital, where any updates are done. Throughout the patient's care, pharmacists consult with physicians to recommend medication changes, check orders for potential drug interactions and allergic reactions, and ensure that medications are working well.





Dr. Michael Schwartz: A neurosurgeon and a gentleman, by Noreen Smith.

## Artistic appreciation

*How Noreen Smith overcame a severe shaking disorder through a novel surgical procedure at Sunnybrook, and regained her ability to sketch*

**B**y 2016, Noreen Smith couldn't even drink from a glass of water. Her diagnosis of essential tremor disorder, which causes severe shaking during routine tasks, had, over time, robbed her of the ability to perform everyday activities and joyful pursuits such as creating quick sketch portraits.

Later that year, Noreen came to Sunnybrook to undergo a revolutionary surgical procedure for her condition. Performed by a specialized team led by neurosurgeon Dr. Michael Schwartz, the MRI-guided focused technique used ultrasound waves to heat and treat specific areas in her brain caus-

ing the tremors. All of it was done through a specialized helmet, making the surgery incision-free.

For Noreen – and other patients who have undergone this procedure to test its use for a growing number of conditions – the surgery has allowed her to embrace parts of her life that she feared would be forever lost. “This is the first portrait I have attempted in nearly 30 years,” she says of her recent sketch (shown above). “I am very grateful for the treatment I received at Sunnybrook and now feel encouraged to pursue more artistic endeavours.”

– Monica Matys



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