

# HERE

2020  
2021

**GIANT STEP FORWARD**  
Life-changing advancement in amputation surgery

**PRACTICE MAKES PERFECT**  
How the ICU staff prepared for COVID's first wave

**NEVER SAY NEVER**  
An implant has the potential to change the lives of people with spinal injuries

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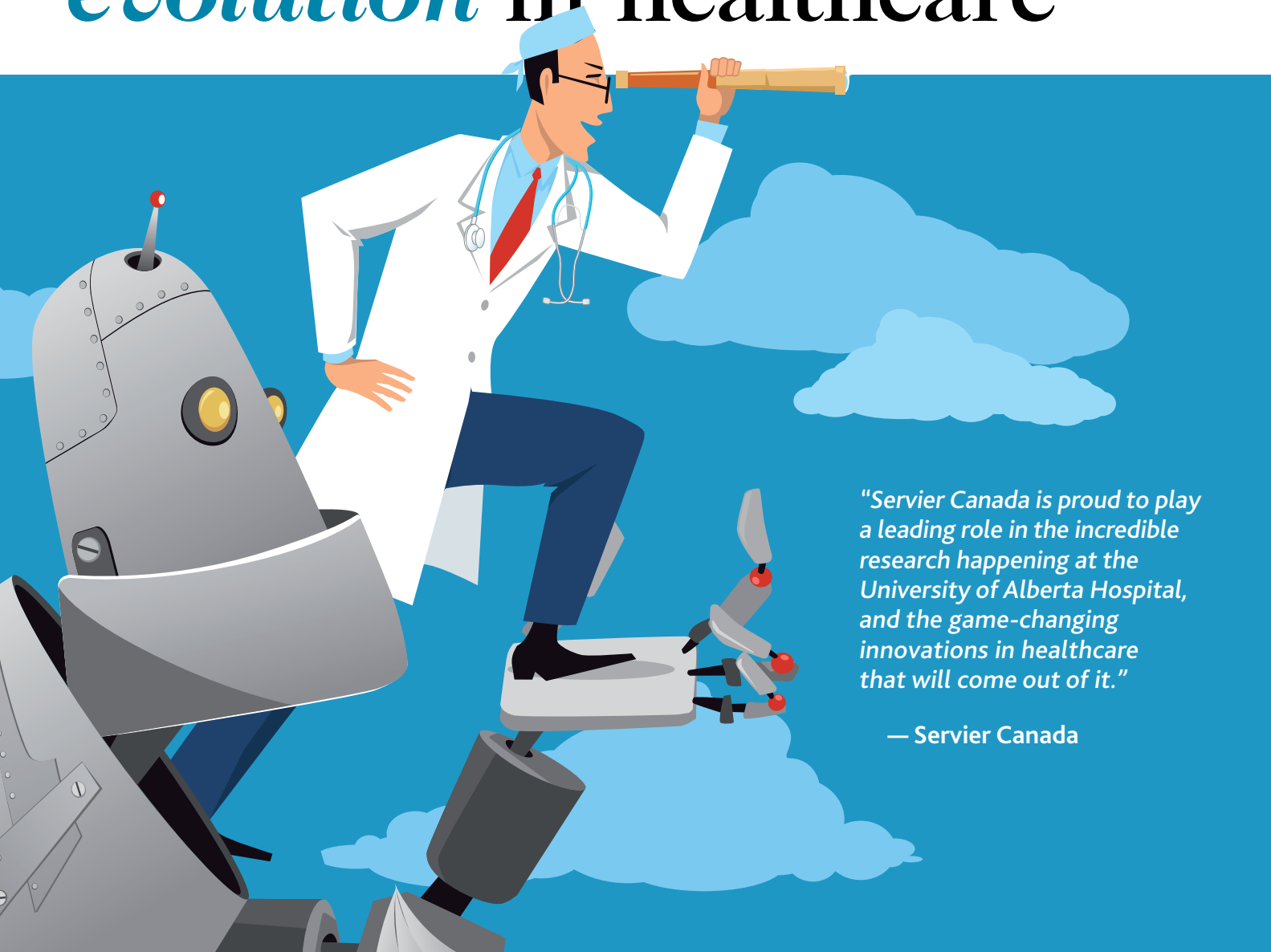
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TAKE A TOUR OF CANADA'S FIRST STROKE AMBULANCE

## FIRE IN THEIR HEARTS

EMERGENCY RESPONDERS ARE RAISING MONEY TO BENEFIT BURN SURVIVORS

# Alberta is leading *the next evolution* in healthcare



*"Servier Canada is proud to play a leading role in the incredible research happening at the University of Alberta Hospital, and the game-changing innovations in healthcare that will come out of it."*

— Servier Canada

## **MACHINE LEARNING GIVES RESEARCHERS CRITICAL INSIGHTS FROM MOUNTAINS OF DATA.**

Thank you to Servier Canada for making this important research a reality. The Servier Alberta Innovation in Health Fund supported seven Alberta-based projects using machine learning and accelerating research and innovation in the areas of cardiac sciences, diabetes, neurology and oncology.

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and **DON TREMBATH**

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University Hospital Foundation



DONORS, BOTH INDIVIDUALS AND CORPORATE PARTNERS, HAVE PLAYED INTEGRAL ROLES IN MAKING EVERY ONE OF THESE ADVANCEMENTS – AND MANY MORE – POSSIBLE.

— DAVID FINLAY, BOARD CHAIR  
UNIVERSITY HOSPITAL FOUNDATION



# RIGHT WHERE WE WANT TO BE

A Message from Dr. Jodi L. Abbott, President and CEO

**H**ealth care as we know it is changing.

Advancements in research and patient care are moving quickly. Citizens are more informed about available options – and expectations on our doctors and medical teams are higher than they've ever been.

Thanks to the work of our incredible researchers and the brilliant providers at Alberta Health Services, people are spending less time in the hospital than ever before, and more time being cared for in their communities, closer to their family and friends.

They are able to do this because at the University of Alberta Hospital, we have:

- **Surgeons doing brain surgeries without incisions with Gamma**

**Knife; a patient with a debilitating brain condition arrives in the morning, has radiosurgery, and is home in time for dinner that same evening;**

- **Cardiac surgeons performing major heart surgeries through incisions small enough to fit between two ribs, which dramatically shorten recovery times;**
- **An emerging Virtual Hospital program where patients receive the same level of care as they would get in the hospital – without leaving their homes;**
- **A growing home hemodialysis program, with over 100 Albertans dialyzing at home;**
- **Programs that get patients mobile as soon as possible after surgeries.**

My colleague, David Finlay, the chair of our board of trustees, says it best: “Donors, both individuals and corporate partners, have played integral roles in making every one of these advancements – and many more – possible.”

They continue to play a role in innovation and research today that will transform the care that patients facing life-threatening injuries and illness receive for decades to come.

Thanks to our donors, the University Hospital Foundation is a catalyst for health research and innovative care that will impact your families and mine – and families around the world.

So yes, health care is changing. And we are right there in the middle of it, connecting the incredible generosity of our donors with more ways to save and change lives, right where we want to be. ■



# THANK YOU

**to all the health professionals for their  
tireless dedication during these trying times**

SUEZ North America is committed to doing its part to assist Albertans in need by donating to the University Hospital Foundation's COVID-19 Emergency Response Fund. Because we're all in this together.

SUEZ is dedicated to environmental sustainability and sustainable resource management, providing drinking water, waste water and waste services to over 100 million people every day.

[suez-na.com](http://suez-na.com)

## KITCHEN by brad smoliak

### EVERY WEDNESDAY SHOULD BE A **KITCHEN-TO-GO WEDNESDAY**

Take home a hearty, two course, ready-to-serve meal for only \$25+GST every Wednesday. Prepared in our kitchen; enjoyed in yours.

\$5 from every take-out meal supports the University Hospital Foundation.



Check our Kitchen's website for new weekly menus at [kitchenbybrad.ca/events/kitchen-to-go](http://kitchenbybrad.ca/events/kitchen-to-go)  
[kitchenbybrad.ca](http://kitchenbybrad.ca) | 780.757.7704 | [info@kitchenbybrad.ca](mailto:info@kitchenbybrad.ca) | #101, 10130 – 105 St, Edmonton



# STROKE AMBULANCE

illustration by KIDPIXEL

The University of Alberta Hospital's Stroke Ambulance is the first of its kind in Canada, and one of only two such units in the world that serves a rural population. By being able to treat stroke patients en route to the hospital, including the administration of clot-busting drugs, we are able to increase positive outcomes. The ambulance is staffed by an Advanced Care Paramedic, Primary Care Paramedic, CT Technologist, Transport RN and a Stroke Physician.

The ambulance responds to an average of 50 calls per month.

CT Scanner, so patients can be examined in transit.

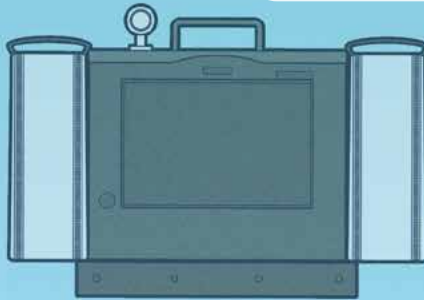
Lifebot video conferencing equipment, so the crew can connect with a Stroke Neurologist at the hospital.





Treats rural patients 73 minutes faster than the usual care.

**LIFEPAK** used in all EMS ambulances. It monitors vital signs and is a defibrillator.



The ambulance can respond to patients in a 250-kilometre radius from base.

**2 MILLION**  
The number of neurons a patient loses each minute after suffering a stroke. This is why early treatment is so critical.

The ambulance also has point-of-care lab testing. Blood work and analysis can be done on the ambulance, within minutes. And a ventilator, so the patient can receive breathing assistance.





**HEROES. MO**





by **DON TREMBATH** + photography **PAUL SWANSON**

# **DELS. FUNDRAISERS.**

FIREFIGHTERS ARE HEROES, RACING TO SITUATIONS THE REST OF US TRY DESPERATELY TO ESCAPE.



**FROM LEFT TO RIGHT:  
CURTIS MOSS,  
JAMES BRUCE,  
ANDY DRYER,  
TREVOR BROPHY,  
THOMAS CARR,  
DR. JODI L. ABBOTT**

**WHAT THEY SEE** in the aftermath of a five-alarm blaze or horrific workplace accident can be heart-stopping – people of all ages ravaged by burns to all parts of their bodies.

The recovery process from severe burns is painfully long and full of infection risks that can prolong the already-arduous journey.

So the firefighters do something about it. They raise money to support the doctors and medical teams who care for burn survivors. And they have fun doing it because... why not?

Over the last 10 years, the Edmonton Firefighters Burn Treatment Society (EFBTS) has donated over \$2.5 million to the University Hospital Foundation in support of the University of Alberta Hospital's Firefighters' Burn Treatment Unit, regarded as one of the best in Canada.

Since its incorporation in 1977, the EFBTS has donated close to \$13 million to the University Hospital Foundation, including gifts-in-kind.

James Bruce, Chairman of the EFBTS and a firefighter himself, says the desire to reach out and do more to help burn survivors is a natural consequence of the profession. "We've all seen what fire can do to a person. I've been burned myself when I was working in the trades. I was lucky to receive quick, effective treat-

ment that greatly minimized scarring."

Most of the money they raise is through golf tournaments and sales of their 'Turn up the Heat' firefighters' calendar, featuring female and male firefighters from Edmonton and surrounding areas.

"It's a fun way of raising money for a very serious cause," says Bruce of the calendar. "We keep it professional, but we have a good time. People love it."

Funds raised support all aspects of burn treatment care, as well as the Alberta Fire Fighters' Burn Camp for Children, an annual, week-long camp for 70 burn survivors between the ages of seven and 17.

"Doctors, nurses and firefighters from across Alberta get together to organize and run the camp," says Bruce. "Our goal is to make sure camp is always free of charge to every camper. The average cost per camper is about \$1,000. We're about 60 per cent of the way to our goal." The camp was put on hold this year due to the pandemic and vulnerability of young burn survivors, so the EFBTS had to pivot and get creative with its fundraising efforts – it is hoping to increase the amount of funds raised through calendar sales so it is able to recoup and funds normally raised to put on the camp. With the support of the

University Hospital Foundation, friendships with fire departments and private companies across Alberta and beyond – James is confident Edmontonians will help in any way they can.

Dr. Ted Tredget, Director of the Firefighters' Burn Treatment Unit, says financial support from the EFBTS has led to advancements in patient care today for the 150-200 burn patients of all ages the unit cares for each year. The funding is also helping to develop and improve burn treatment and recovery in the future.

"We do a lot of research in a variety of areas in burn treatment. Right now, I'm involved in a study that's looking at reducing the impact of scarring and scar tissue on burn survivors. Severe scarring can distort your facial features or limit your range of motion and function, say, in your hands if you're a carpenter or electrician. We'd like to restore the healed wound to a normal condition, and avoid successive scarring.

"It's probably the leading post-recovery complication that burn patients have that compromises their quality of life."

Thanks to the fundraising efforts of Edmonton's firefighters, and killer abs, research and patient care at one of Canada's top burn treatment units will only get better. ■





# COVID IMPACT

A THREE-PART COLLECTION OF STORIES THAT  
ILLUSTRATE HOW THE UNIVERSITY OF ALBERTA  
HOSPITAL PREPPED FOR COVID >

BY **STEVEN SANDOR & DON TREMBATH**  
PHOTOGRAPHY **COOPER & O'HARA**



\* DR. PETER BRINDLEY (ABOVE)  
AND TARYN GANTAR WERE  
PHOTOGRAPHED USING ZOOM



DIALYSIS  
PATIENT  
TARYN  
GANTAR

# SAFE AT HOME

THANKS TO DONOR  
SUPPORT, HEMODIALYSIS  
PATIENTS HAVE MORE  
OPTIONS TO GET  
TREATMENT AT HOME

**TARYN GANTAR WAS SURPRISED TO** hear what the doctor was telling her.

"He told me my kidneys were failing and I had to start dialysis treatments.

"I went straight into denial. There was no way he could be right, even though I felt really awful." That was 20 years ago, when Gantar was 23, and the mother of a one-year-old daughter.

"Dialysis is hard but without this life-saving treatment, I would not be here today."

Gantar is still on dialysis today.

She is one of over 1,500 people living with end-stage kidney disease who receive treatment through Alberta Kidney Care - North, currently headquartered at the University of Alberta Hospital but with plans to relocate one of the units away from the acute-care hospital setting.

Patients receiving hemodialysis in-hospital are put on a regular schedule of four hours per day, three days per week, plus additional time, and energy, traveling to and from the hospital, looking for parking, and even walking back and forth from the dialysis unit. It may not sound like a big deal, but it is. "You feel tired after dialysis," says Gantar. "The last thing you want to do is walk back to your car and drive home or spend hours on a DATS bus."

Ten years ago, Gantar decided to try dialyzing at home, a decision that she credits for turning her life around. "Home hemodialysis has given me my life back. It's convenient. It's empowering. You have the ability to dialyze more often, when you want and how you want in the comfort of your own home. And you feel so much better. You can do things that other people do. I work full-time. I volunteer for the Kidney Foundation and Alberta Health Services. I feel well enough to spend

quality time with my friends and family. I have my life back."

Dialyzing at home is also comfortable and convenient - especially during COVID-19. "Being able to have patients dialyze at home is enormously desirable in the setting of a global pandemic," says Dr. Robert Pauly, Home Hemodialysis Medical Director, Alberta Kidney Care - North. "As a result of COVID-19, many health-care resources have been scaled back or redeployed toward essential services; one notable exception has been training for home therapies. This shows the inherent value our system has placed on continuing to encourage people to receive their therapy in a setting that is much better for them."

As the director of one of the largest home hemodialysis programs in the world, Dr. Pauly credits community support for providing critical funding needed to purchase additional home dialysis machines.

In 2012, Edmonton philanthropists Matt and Betty-Jean Baldwin made a \$1 million



**"HOME HEMODIALYSIS  
HAS GIVEN ME MY LIFE  
BACK. IT'S CONVENIENT.  
IT'S EMPOWERING."**

— TARYN GANTAR

donation to the University Hospital Foundation. The University Hospital Foundation matched their gift with a \$1 million gift of its own, to fund the purchase of 45 additional home hemodialysis machines for the University of Alberta Hospital. With this increase, the program expanded to 100 machines.

"The growth that we've had in our program is a direct result of collaboration between donors to the University Hospital Foundation, Alberta Health Services, and a dedicated multidisciplinary team of doctors, nurses, biomedical technologists, social workers and dietitians," says Dr. Pauly. "Together, we can help our patients get home and stay at home." ■



**DR. PETER BRINDLEY, INTENSIVE CARE UNIT, U OF A HOSPITAL**

# MEDICINE BEHIND THE MASK

## INTENSIVE-CARE PROS WERE READY FOR THE PANDEMIC

**WHEN A HOCKEY TEAM PREPARES** for a best-of-seven Stanley Cup showdown, the players practice, practice and practice some more. They try to recreate game scenarios during their practice sessions. They look at video of the opposing teams and try to pick out their strengths and weaknesses. Each player applies everything he's ever learned about hockey to winning the big prize.

In a lot of ways, the Intensive Care Units at the University of Alberta Hospital function a lot like that. Like pro athletes, the health-care professionals practice, practice, practice. They talk about worst-case scenarios and how to deal with them. They learn how to manipulate delicate medical instruments while wearing bulky, protective suits. Basically, they learn how to pick up car keys while wearing mittens.

As the virus spread through Asia and then through Europe in the winter of 2020, critical care physician Dr. Peter Brindley and his General Systems Intensive Care Unit and Neuro Sciences Intensive Care Unit teams were prepping for when, not if, the virus would come to Edmonton.

"We're always preparing for something or practicing for something even if it's

something we've seen a thousand times before," says Brindley.

Medicine is a hands-on business that requires the coordination of a well-oiled powerplay unit. So, Brindley and the ICU staff had to practice how to perform all of their tasks while wearing protective gear that he likens to spacesuits.

"We did a lot of simulation exercises, wearing the full gear," he says. "The isolation gear keeps us safe, but equally makes communication difficult. Routine things like putting a tube into someone's throat to help them breathe can actually be very difficult when you have this gear on, because it's tough to coordinate the team. The procedures we do in the ICU require a level of manual dexterity and mental quickness, so you can coordinate the team and say 'hey I need this.' That's very difficult with the extra equipment we're wearing. So, we had to practice that. We had to back up and say 'let's go back to basics, here. We have to re-learn how to this.'"

And, as they practiced to receive a wave of patients, they also made sure to get themselves as well-rested as possible. They were told to prep their families, so they could get the support they needed at home

after an exhausting shift in the ICU. They looked at best practices from professionals around the world who deal with crisis situations. They weren't just practicing how to place tubes with PPE on, they were mentally getting ready for the stress that comes with a pandemic.

As Brindley and his teams were preparing for the arrival of COVID, donors to the University Hospital Foundation were doing the same, preparing for a pandemic they had never experienced before in the way they knew best - by digging deep and making donations in support of anyone who may need it.

The University Hospital Foundation's Emergency Response Fund has raised critical funds to support response efforts, including a safe biorepository to preserve samples taken from people who test positive for COVID-19 that will support dozens of world-class researchers.

Funding from Festival of Trees contributed to Text4Hope, a mental health initiative that has helped nearly 50,000 Albertans struggling with the over-whelming impact of the pandemic on their lives, and in partnership with Alberta Health Services and five other major health foundations.

But that's not all. Brindley and the staff expressed their appreciation for the many donations of food, coffee and treats received from individuals and businesses.

"The good stuff," says Brindley. "Totally unexpected. Right from the heart."

He said the staff also received donations of plastic protectors, which keep the masks' band from chafing the skin behind the ears. Without them, he said the skin behind the ears becomes red and raw after a 12-16 hour shift. Tablet devices were donated, allowing patients who were isolated to have virtual visits with family and friends.

"The ingenuity of Albertans came to the fore, and that was filtered through the University Hospital Foundation," he says.

Brindley believes that masked medicine is here to stay. As COVID-19 hasn't gone away, images of doctors and nurses covered in plastic, their faces obscured by shields, will become a new normal. But he also understands that the necessary suits are intimidating for patients. And, so, every effort has to be made to make sure the humanity of the caregivers shines through the sterile environment.

"We even talked about if we should have big pictures of ourselves out of our gear, so the patient can see that there's a human being who cares deeply about them." — **S.S.**





**BILL AND  
COLLEEN  
MAXIM**

# MIRACLE MAN

BILL MAXIM THOUGHT HE HAD THE FLU. HE WAS WRONG

**SOMETIME DURING THE** evening of Monday, March 30, about two weeks after schools in Alberta were shut down for the year due to COVID-19, Bill Maxim mentioned to his wife of 58 years, Colleen, that he was having trouble breathing.

Colleen was immediately alarmed. It wasn't the first time that week that Bill had said he wasn't feeling well. In fact, he had just seen a doctor a few days before. Don't worry, he'd been told. It's the flu.

Really? Colleen wasn't convinced. *The flu?* It seemed more than that. To be safe, she called 911. Within minutes the ambulance had arrived, paramedics were in their home, and Bill was being wheeled out of the house on a stretcher.

Colleen, sorry she couldn't go with him but satisfied that they'd find out what the problem was, expected to see him back home in a day or two. A week at the most.

At the University of Alberta Hospital, Bill tested positive for the coronavirus. Although he was in remarkably good health and had no other medical conditions, his age, 81, placed him among the most vulnerable of COVID-19 patients.

His condition deteriorated rapidly. By the next day he was on a ventilator. Blood clots developed on his lungs.

Back home, Colleen wasn't faring well either. Denied the chance to see Bill in the hospital and physically removed from her family and friends, she was alone with her fears that she may never see her husband again. "No one could tell me anything because no one knew what was going on. It was all still very new."

Even Bill's medical team at the hospital wasn't sure if he would survive. But they did know this:

That thanks to incredible community support that has

touched every corner of care at the University of Alberta Hospital, Bill got the best possible care.

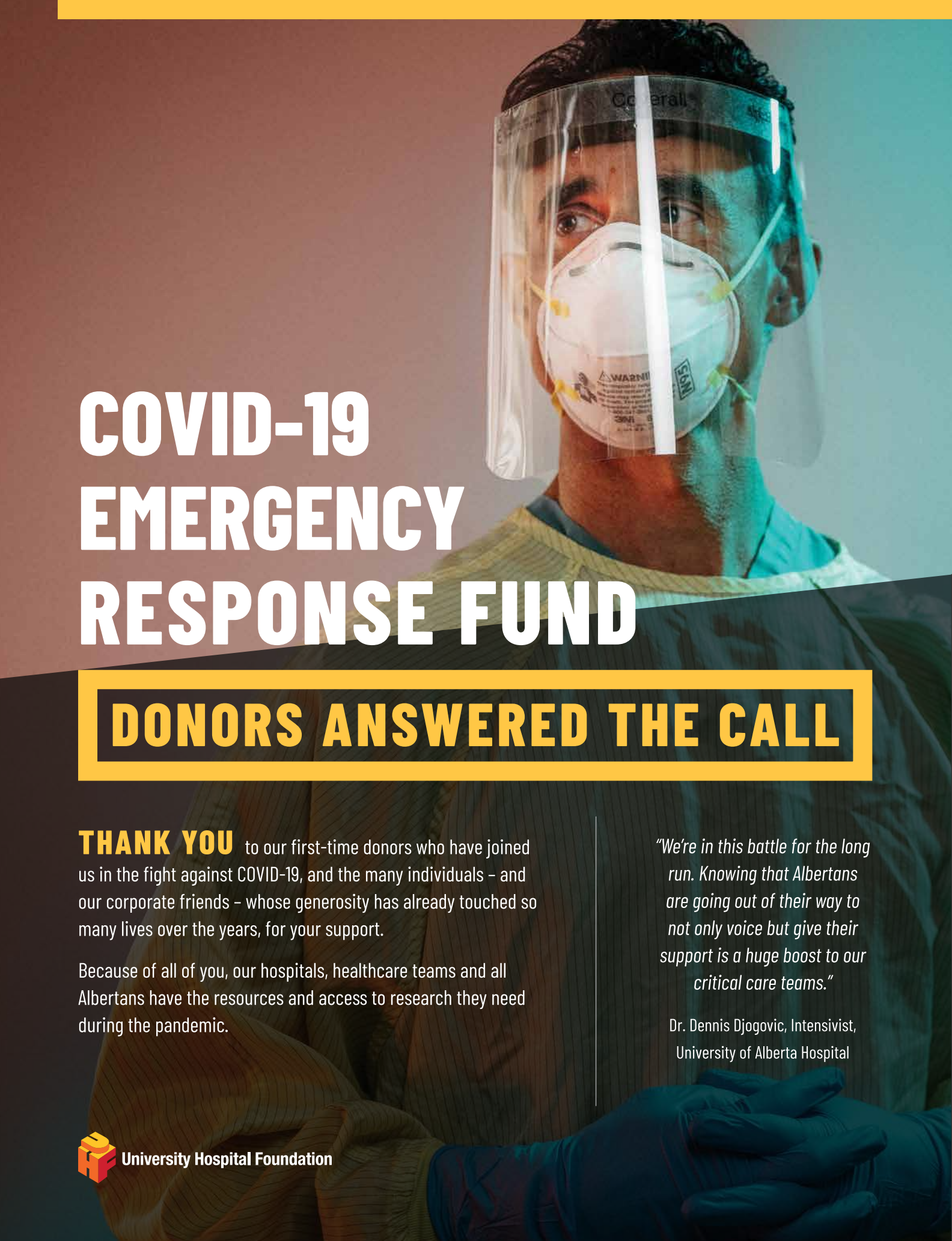
And, that his team of doctors, nurses, respiratory therapists, pharmacists, occupational physiotherapists and infection control specialists would do everything in their power to keep him alive.

And, they did.

After 13 days on a ventilator, four additional days in intensive care, and another two full weeks in the internal medicine unit, Bill was transferred to the Glenrose Rehabilitation Hospital to help with strength and conditioning.

Today he's known as The Miracle Man, which he most certainly is. He even made a gift to the University Hospital Foundation out of gratitude for the care he received when he was fighting for his life.

His medical team is back on the front lines, trying to create as many more miracles as they can. — D.T.



# COVID-19 EMERGENCY RESPONSE FUND

**DONORS ANSWERED THE CALL**

**THANK YOU** to our first-time donors who have joined us in the fight against COVID-19, and the many individuals – and our corporate friends – whose generosity has already touched so many lives over the years, for your support.

Because of all of you, our hospitals, healthcare teams and all Albertans have the resources and access to research they need during the pandemic.

*“We’re in this battle for the long run. Knowing that Albertans are going out of their way to not only voice but give their support is a huge boost to our critical care teams.”*

Dr. Dennis Djogovic, Intensivist,  
University of Alberta Hospital



University Hospital Foundation



# HOW HAS **YOUR RESPONSE** MADE A DIFFERENCE?

## FAIR QUESTION.

With billions of dollars being raised around the world to fight COVID-19, *what specifically has your donation to the University Hospital Foundation done?*

## WELL, A LOT.

Here is a look at what we've accomplished together since establishing the COVID-19 Emergency Response Fund. The support raised for COVID-19 response efforts have helped fund:



## **DIAGNOSTIC EQUIPMENT**

was purchased for the intensive care units at the University of Alberta Hospital and Mazankowski Alberta Heart Institute, which provides better monitoring and diagnostics for the most severely ill COVID patients, and gives researchers valuable insight as they continue to gain more knowledge about the virus.

## **THE ALBERTA 3D PPE TEAM**

addressed personal protective equipment (PPE) shortages related to the COVID-19 pandemic by using 3D printers to locally manufacture and distribute 2,200 face shields to Alberta's front line health care providers. They are a team of Edmonton's frontline medical professionals and industrial designers, engineers and computer scientists.

## **TEXT4HOPE**

is a free service providing three months of daily Cognitive Behavioural Therapy (CBT) based text messages written by mental health therapists. An Alberta-based innovation, Text4Hope is an evidence-based program helping people identify and adjust the negative thoughts and behaviours a pandemic might be expected to provoke. Nearly 50,000 Albertans subscribed to this service.

## **SAFE BIOREPOSITORY**

was created in partnership with five major health foundations to preserve COVID-19 samples and support world-class medical research. Dozens of Alberta-based researchers working on more than 30 Alberta research projects need the COVID-19 samples to explore areas like rapid point-of-care testing, drugs, antibody testing, and genome sequencing.



# TO WALK AGAIN

Researchers are developing a way to restore the ability to walk in people who've been told it would never happen

by **STEVEN SANDOR** illustration **PETE RYAN**

**Over the course of the next three years, Dr. Vivian Mushahwar and her team will be readying their experimental spinal implants for an eventual human trial.**

Their research could change the lives of patients who have long-term spinal-cord injuries.

“The goal is to return the function of standing and walking to people with severe injuries to their spinal cords, those who do not have residual connections,” says Mushahwar.

What does this mean? Mushahwar and her team from the SMART Network are working on a small electrical implant that would act as a bridge between the part of the spinal cord that controls the legs and the brain. When people experience paralyzing injuries, the electrical link between the brain and what’s known as the lumbar enlargement – a five-centimetre region near the base of the spine – is cut. But, if both the brain and the lumbar enlargement are still active, Mushahwar – whose first degree came in the field of electrical engineering – believes they can be reconnected using a small implant that bridges the damaged area.

“The first goal is to make sure the restored walking is stable,” she says. “In the first generation, control signals to the implant can be transmitted from a system worn like a belt. In the future upgrades, signals from the brain can directly, intuitively and automatically control the implant in the same manner that persons who do not have a spinal cord injury can seamlessly stand and walk.”

But, before it can be tested in humans, Mushahwar and her team will spend the next three years testing the implant on pigs. Trials have already been successful in cats and



## DONOR URGES COMMUNITY TO KEEP RESEARCHER'S WORK IN EDMONTON

monkeys – but pigs are vital, because, as Mushahwar says, their bone and spinal structure is closer to humans than any other mammal.

Her team is receiving funding from the U.S. Department of Defense to aid in this stage of trials.

“If this is successful, then we would go to Health Canada, and the (American) FDA to get approvals to prepare for the first trial in a human,” Mushahwar says.

How does it work? For many people, after they experience a spinal-cord injury, the part of the spinal cord below the injury remains alive. This means that the lumbar enlargement – that area that controls leg motion – remains in working order.

So, the electrical implant basically allows the enlargement to receive commands and functions as though it is receiving orders again from the brain.

A flat coil under the skin wirelessly receives signals from a “smart belt” and transmits them to the implant. Not only does the belt act as the control point that the recipient uses to send control signals to the implant, but it also houses batteries, so there’s no need for repeat surgeries. Mushahwar says that, at the human-trial stage, the implant recipients will likely need to use canes or possibly even crutches in order to keep their balance. In a lot of ways, they will need to re-learn how to walk.

The SMART Network, based at the University of Alberta, is a research lab headed by Mushahwar that brings together great minds from a

variety of different fields – neuroscientists, engineers and doctors – to collaborate

Local philanthropist Jim Hutton is concerned that if a big American university steps in to fund the rest of Dr. Mushahwar’s work, Edmonton will have lost the opportunity to become home to one of the greatest discoveries in modern day medicine.

“It would be a tragedy if one of those big universities swooped in to fund the final phase of her research,” says Hutton, a longtime donor to University Hospital Foundation. “They get the credit and we get nothing.”

After donating to the Mazankowski Alberta Heart Institute and the University Hospital Foundation’s Brain Centre Campaign, Hutton was introduced to the work being done in spinal-cord research at the University of Alberta’s SMART Network.

Mushahwar’s research meant a lot to Hutton, who had a



family member suffer a severe spinal-cord injury in the 1970s.

Hutton said he was expecting to see “some sort of mechanical device” to help those with spinal-cord injuries regain some mobility, not the advanced implant.

“To my great surprise, it wasn’t that at all,” he says. “The sophistication of it was unbelievable. She is just a whisker away from being able to make a person walk.”

Not only did he commit targeted funding, he’s acted as an evangelist for the program, telling others that the SMART Network is worthy of support. A retired engineer, Hutton was fascinated by the mixing of medicine and electricity. He invited Mushahwar to speak to the Society of Senior Engineers, a professional group to which he belongs.

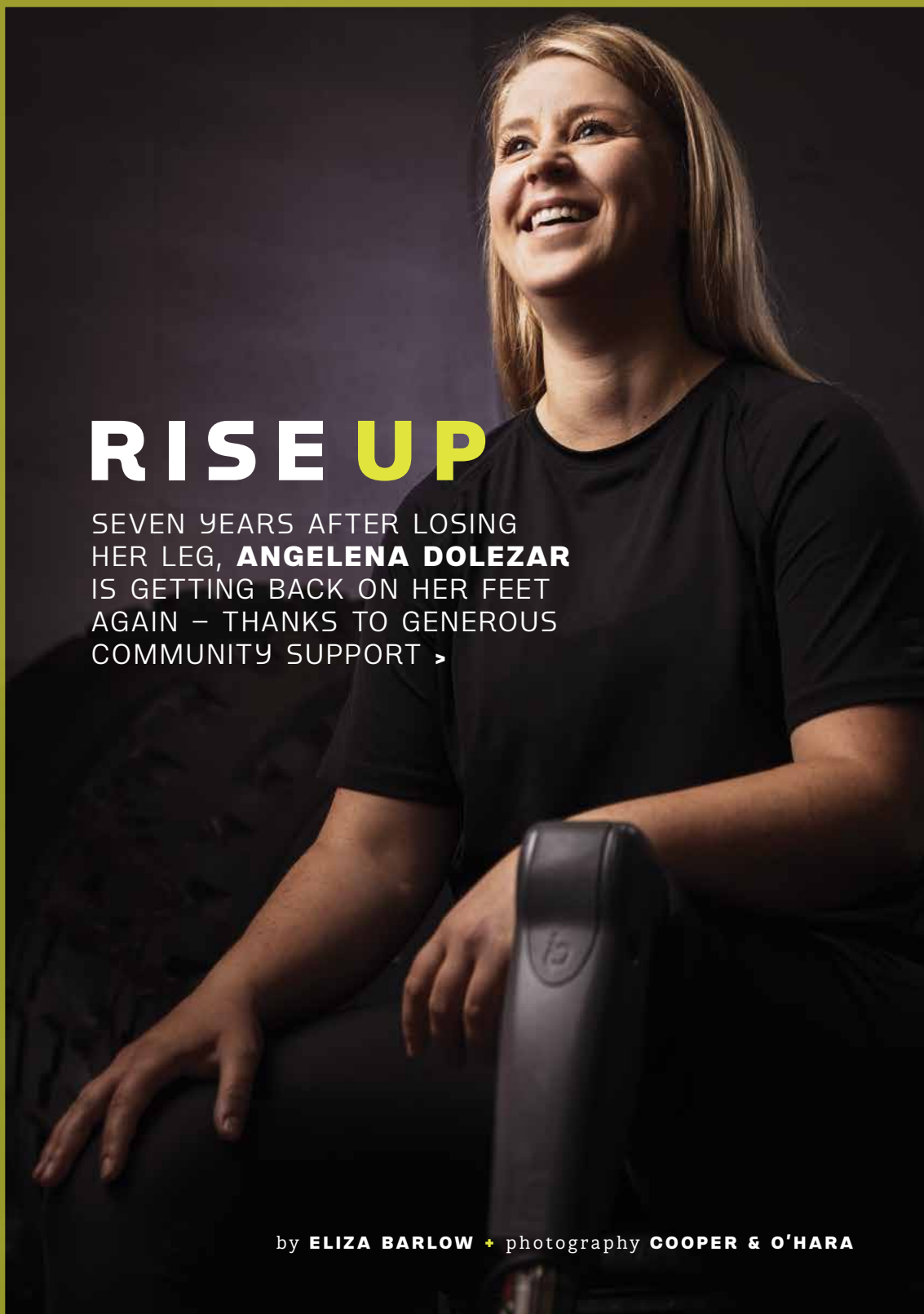
“She is a treasure we can’t afford to lose.”

on new systems to help people who experience neural injury or disease to recover their mobility. As medicine advances, there is a greater need to collaborate with experts from fields other than medicine. As the spinal cord is basically an electrical system, engineers can bring fresh perspectives to ideas that have befuddled doctors for years. Crossing disciplines and collaboration leads to better outcomes.



It attracts world-class talent; Mushahwar is a prime example; she studied electrical engineering at Brigham Young University, then bioengineering at the University of Utah. She continued her American studies at Emory University in Atlanta before coming to Edmonton to work on her post-doc in neuroscience. When an institution provides world-class research opportunities, it can then attract world-class talent.

If, a few years down the road, some wheelchairs are relegated to the scrap heap, Mushahwar’s research will definitely have been worth it. ■



# RISE UP

SEVEN YEARS AFTER LOSING  
HER LEG, **ANGELENA DOLEZAR**  
IS GETTING BACK ON HER FEET  
AGAIN – THANKS TO GENEROUS  
COMMUNITY SUPPORT >

by **ELIZA BARLOW** + photography **COOPER & O'HARA**



A

Angelena Dolezar can already do things she couldn't do before, like walk without her leg falling off, but she's not

quite where she wants to be just yet.

It will take several more months to recover from the surgery that connected her new prosthetic leg to her thigh bone – a procedure called osseointegration.

“Full recovery is a year ... until your implant is ossified into your bone,” says Dolezar.

“It's grueling right now, but I know, in the long term, it will be much better.”

Dolezar, 35, is the first person to receive osseointegration in Alberta and one of two patients who have undergone the surgery since the program launched at the University of Alberta Hospital earlier this year.

Funding for the procedure came from the community through the University Hospital Foundation's Festival of Trees, a long-standing source of community generosity that has generated more than \$22 million in support for nearly every corner of care at the hospital site.

“Everyone knows how generous Edmontonians are,” says Dolezar. “I just never thought I'd be the recipient of it.”

## LIFE-CHANGING INJURY

Healthy and active her entire life, Dolezar's houseboating trip with friends was supposed to be a fun few days in beautiful British Columbia.

“I motioned for the driver to slow down and I was thrown into the water. I knew my leg was hurt, but I never thought it was as bad as it was.”

After a month in hospital, doctors determined that Dolezar's injured leg would have to be amputated. “Knowing that you're going into a surgery that's going to change your body forever is really hard,” she recalls.

Surgeons amputated her leg above the knee. For the next several years, Dolezar tried her best to cope with a traditional prosthetic leg, even competing in the sport of sitting volleyball on the Canadian Paralympic team. >



But her prosthetic leg was an endless source of pain and frustration. “I can’t really do a lot of the things that I used to do,” Dolezar said before receiving osseointegration. “It’s just like, my [prosthetic] leg falls off all the time and it’s so frustrating.”

It’s a situation Dr. Jacqueline Hebert has seen many times in her work as a rehabilitation physician.

“There are a number of patients who have an amputation and they do OK with regular treatment,” says Hebert. “But there is a significant percentage of people that don’t do well with the traditional treatment. We try so many different things and they’re just not successful. For those people, their quality of life is very poor. Their life is constantly revolving around what’s going on with their leg and how their prosthesis is fitting.”

## LIKE DENTAL IMPLANTS FOR LEGS

Dolezar’s young age and the constant problems she had with traditional prostheses made her a good candidate for osseointegration, the most advanced procedure for attaching prosthetics in the world.

Defined as the fusion of bone into titanium – osseointegration has been around for many years. It’s used in procedures like dental implants. Titanium has special properties that allow bone to grow in and around it. But this new application of osseointegration is groundbreaking in the way it allows amputees to use prosthetic limbs.

“The traditional way of attaching a regular prosthesis to the limb is by putting this hard plastic shell around the limb and squeezing the soft tissue. You can imagine putting a large band around your thigh and rolling it around, you can’t control the bone,” Hebert says.

The beauty of osseointegration is that it puts the connection back between the ground and the patient’s skeleton.

“For a lot of patients, when they actually step on the prosthesis, it’s a very different feeling,” says Hebert. “It’s like they’re stepping on their own foot again. They say, ‘I feel like it’s coming right through my bone now, I can feel my foot, I can feel when I hit the ground, I can feel the vibration when I

swing my leg.” Hebert and Dr. Robert Stiegelmar, an orthopedic surgeon at the University of Alberta Hospital, worked for five years to bring the surgery to Edmonton. When organizers of the 2019 Festival of Trees, UHF’s largest fundraising event of the year, took up osseointegration as the official cause, the doctors became more hopeful than ever that Dolezar, and others, would get the surgery that would put them on their feet again.

**“IT WAS CRUCIAL TO HAVE THE INVOLVEMENT AND SUPPORT OF THE FESTIVAL OF TREES TO BRING THIS PROGRAM TO REALITY,” SAYS HEBERT.**

In recent years, Festival sponsors, led by Reza Nasser’s Landmark Homes, individual donors and tens of thousands of ticket buyers, have contributed millions to bring such groundbreaking innovations as Canada’s first Stroke Ambulance and Gamma Knife, the most advanced non-invasive brain surgery in the world, to the University of Alberta Hospital.

“It was crucial to have the involvement and support of the Festival of Trees to bring this program to reality,” says Hebert. Before the festival was over, Dolezar’s surgery date was booked.

## BRIGHTER FUTURE FOR AMPUTEES

Hebert and her team see about 100 new amputees every year from the Edmonton area and northern Alberta. The vast majority are due to diabetes and other vascular causes, while others are due to trauma, cancer, infections or previous injuries that didn’t heal.

About 30 per cent of them have had leg amputations above the knee. But only a portion of those – Hebert estimates five new patients per year – would be candidates for osseointegration.

That’s because candidates for the procedure need to be young and relatively healthy with good bone stock, for the best chances of success.

“We are starting very conservatively and only choosing the absolute best ideal candidates at this point because we want to

ensure that we’re getting the appropriate improvements in their health and quality of life,” she says.

But the program may one day expand, says Hebert. She notes that surgeons in Australia, where more than 400 osseointegration surgeries have been performed, have done it on some diabetes- and vascular-related amputations. Other centres have also done osseointegration on below-the-knee and arm amputations.

“In Edmonton, we’ve been starting the procedure on people who’ve lost the leg above the knee, in the thigh bone, because that’s a very limiting amputation,” she says.

For now, the multidisciplinary team is gaining experience and collecting data. Funding raised through the Festival of Trees is allowing it to keep a close eye on patient outcomes.

“The Festival of Trees funds that were raised have allowed us to build an extra infrastructure to collect more data than we would normally collect on a patient going through a procedure,” Hebert says. “So we’ll have our own body of evidence. The best way to introduce a new program is to carefully monitor the first cases going through.”

Just as the osseointegration program got going, the COVID-19 pandemic caused delays. Hebert is looking forward to when the program can resume and help more amputees improve their quality of life.

As Dolezar progresses along the road to recovery, she’s thankful she was able to receive this leading edge surgery here at home.

“I’m grateful that the donors supported the project ... and I’m grateful for the future,” she says. “I’m excited to live a life where my leg isn’t the focus of my life ... I can create an identity that’s me again, with my leg having just been something that happened to me – not the focus and the central component of my life.” ■





# Thank you!

To the heroes of the front lines who are bravely risking their health in the battle against COVID-19, we thank you for your resilience, courage and dedication to keeping our communities safe in these unprecedented times. We salute your compassion and continuing commitment.

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