

QEII TIMES

SHINING A LIGHT ON THE QEII HEALTH SCIENCES CENTRE, ITS STAFF, VOLUNTEERS AND DONORS

FALL 2020

A QEII FOUNDATION PUBLICATION IN ASSOCIATION WITH THE CHRONICLE HERALD

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Interventional radiology (IR) nurse Melanie Carrigan (front) and radiology technologist Wesley Young are part of the QEII's world-class IR team, who have continued to deliver extraordinary care during COVID-19. **Mike Tompkins**

When the world stopped, life-saving care continued

Interventional radiology during COVID-19

By **Nicole Topple**

During the initial peak of COVID-19 in Nova Scotia, our province — and the world — had seemingly come to a halt.

Many businesses had temporarily shut their doors and the once-busy streets felt quiet and empty. But inside the QEII Health Sciences Centre, certain healthcare teams, like Interventional Radiology (IR), were bustling.

IR teams play an integral role in caring for patients from head to toe, treating conditions like cancer, stroke and dangerous bleeding with the most minimally invasive procedures possible.

Under their watch, life-threatening blood clots are eliminated with the nick of an incision, while cancerous tumours are burned and treated through tiny pinholes rather than major surgery.

When COVID-19 first hit, all but life-saving and time-sensitive surgeries and services were postponed across the province. In the world of IR, often every second counts — which is why not even a global pandemic could stop some of these IR procedures at the QEII.

As many healthcare services and elective procedures began to resume, the IR team continued to stand on guard, triaging cases based on their history and urgency and, in some cases, providing another, more immediate option to patients awaiting surgeries that were initially postponed.

For IR nurse Melanie Carrigan,

it was these bustling moments and times of unprecedented change that inspired a sense of pride she says is hard to describe.

“Whether it was dealing with sudden school and childcare closures to the added stress and pressures at home, this pandemic hit everyone differently,” says Melanie. “No matter what was happening in our personal lives, our teams showed up ready to give all they had to protect our patients and each other.”

It’s a sentiment shared by Dr. Christopher Lightfoot, QEII interventional radiologist.

“For many of us, these extraordinary circumstances created one of the most stressful times in our careers,” he says. “But to see our teams continually step up, pitch in and set aside those fears for patient care is incredibly rewarding.”

COVID-19 changed many things for the QEII’s IR team, including how they care for their patients: those who test positive for the virus, those still awaiting test results and those who are incredibly vulnerable because of other health conditions.

According to Dr. Lightfoot, the IR team is not often treating COVID-19-positive patients for the virus itself, but rather other underlying and life-altering health issues.

From resolving dangerous bleeding to inserting and replacing life-saving tubes and catheters, this important care

“*In the early days, as we learned more about the virus, our COVID-19 protocols were changing by the hour.*”

— Katrina Boudreau

continues — regardless of a patient’s COVID-19 diagnosis.

“In the early days, as we learned more about the virus, our COVID-19 protocols were changing by the hour,” says Katrina Boudreau, IR technologist at the QEII. “From start to finish, some IR procedures were taking us three times as long in order to minimize the risk of potential exposure.”

Katrina, Melanie and Dr. Lightfoot all credit the establishment of their department’s own COVID-19 Task Force for keeping their team informed, engaged and, most importantly, safe.

“When the pandemic first hit, we introduced new protocols for almost every aspect of our job,” says Melanie. “Our task force ensured we always had all the information and tools needed to deliver the best care possible to our patients.”

New protocols included everything from how a patient is transported to and from a procedure to limiting the equipment and staff within the IR suites.

In early April, the COVID-19 Task Force introduced “temporary pods” within IR — staff organized into independent teams who didn’t interact with one another and formed their own exclusive workplace bubble.

“This meant that if a pod was exposed and had to quarantine, the remaining IR teams could continue to provide care,” says Katrina.

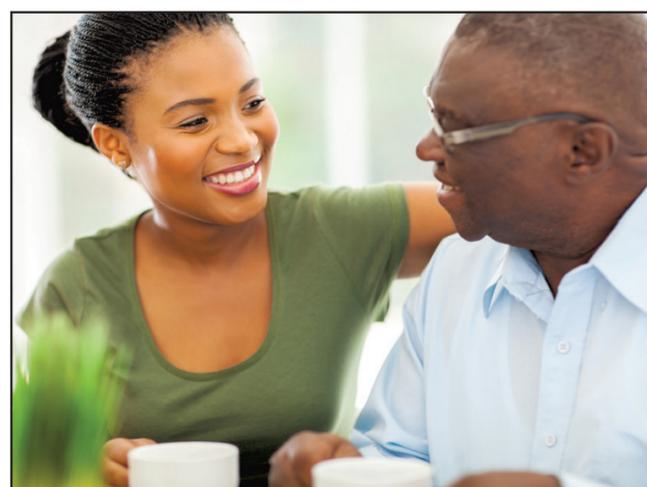
Thanks to our province’s efforts to combat the spread of the virus, things are “mostly back” to a new normal for the QEII’s IR team.

For staff members like Katrina, she says the pandemic has had its silver linings.

“While we’re bumping elbows instead of giving high-fives, you just appreciate your colleagues so much more and that you’re in it together,” says Katrina. “From our porters and booking clerks to the nurses and radiologists, I’ve never been more proud to be a part of it all.”

With the support of QEII Foundation donors, this life-saving area is set for an expansion and even better patient experience.

To learn more about the QEII’s new IR suites and to donate today, visit QE2IRSuites.ca.



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YOUR QEII

QEII TIMES

A QEII Foundation publication in association with The Chronicle Herald, QEII Times is designed to shine a light on the QEII Health Sciences Centre community.

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QEII Foundation

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A word from the QEII Foundation

QEII Foundation welcomes new CEO

By QEII Foundation

Amid the COVID-19 pandemic, the QEII Foundation welcomed new president and CEO Susan Mullin. An experienced leader in healthcare philanthropy, she's excited to be home in Nova Scotia.

Q: You entered this new role during unprecedented times. Has this presented any challenges for you? Have there been any pleasant surprises?

A: My role with the QEII Foundation depends upon relationships built on trust. I've had to really adapt to the realities that we're all facing because of the pandemic. Instead of being personally introduced to important stakeholders at a meeting, a reception or over lunch, introductions happen via email and I'm jumping right into a one-on-one phone or video call, or in good weather, a coffee on a patio.

I am truly grateful for our new comfort with Zoom and other video platforms, but I think we are all missing out on the social niceties of in-person meetings. That said, we're all having to navigate new waters and I've really been overwhelmed by the welcome from donors, board members, staff and health partners and by their desire to help me settle in. But I'm not surprised; it's the Maritime way.

Q: Health care definitely took centre stage during the last few months. What are some of the good news stories you see in health care right now?

A: Health care really has never been more relevant in our lifetime and hospitals like the QEII have become ground zero in the fight to manage and treat people with COVID-19. In order to be ready, the entire health system has had to adapt and respond. Ideas such



Susan Mullin is the QEII Foundation's new president and CEO. QEII Foundation

as virtual care — using video calls and related technology to allow patients to connect with their healthcare provider from the safety of their own home — have advanced based on necessity.

With so much uncertainty in our world and what our province has gone through, a lot of people are struggling with their mental health right now. Having access to the right resources is more important than ever. In fact, the QEII Foundation is working with our community to raise funds to support e-mental health to tackle wait times and ensure care is available to all.

This idea of necessity being the mother of invention also can be seen in our work to bring advanced surgical robotics technology to the QEII. Where reducing the length of surgical procedures and inpatient stays

has always led to improved patient outcomes and often increased surgical capacity, during COVID-19, keeping people out of hospital has taken on new meaning.

Q: What does the first six months in your role look like for you? What is on the horizon for the QEII Foundation?

A: I'm going to continue to do my best to meet as many supporters, business and community leaders, health centre staff and physicians and donors from across Halifax and Nova Scotia as possible. This is an incredibly exciting time for the QEII Foundation as we work with the community to invest in technologies and innovative new ways of providing world-class and compassionate health care.

The reality is, we can't allow COVID-19 to take our eyes off

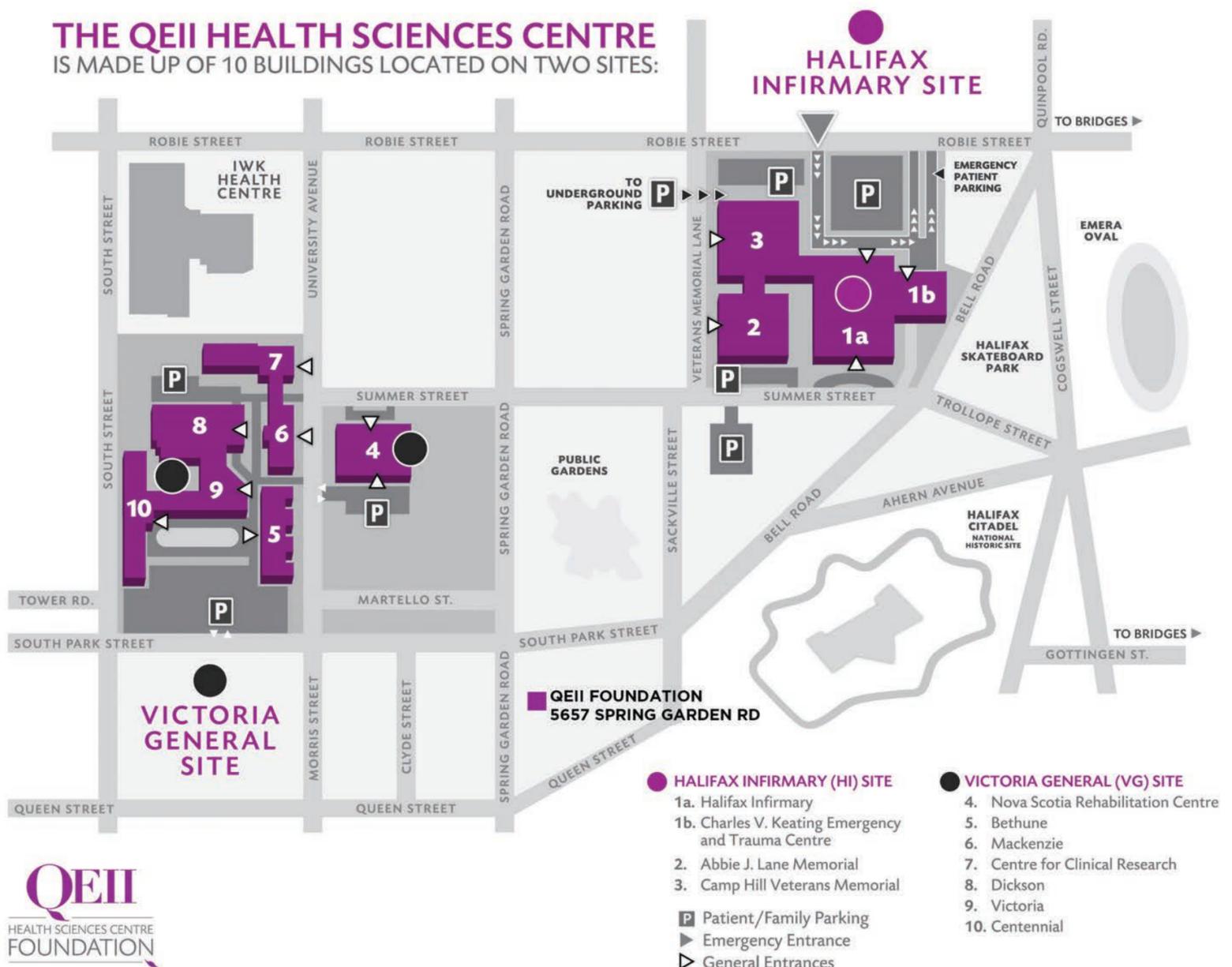
the need for philanthropic investments in heart health, cancer care, surgical innovation, mental health and more. I know our community will continue to support the QEII and ensure the very best care is available here at home.

Q: Any special message to donors as you settle back home in Nova Scotia?

A: Thank you for welcoming me and my wife home to Nova Scotia. We're thrilled to be here and I'm excited for what we can do together to impact health care for the province and, indeed, the region.

For more information about the QEII Foundation, call 902 334 1546 or drop us a line at info@qe2foundation.ca.

THE QEII HEALTH SCIENCES CENTRE IS MADE UP OF 10 BUILDINGS LOCATED ON TWO SITES:



QEII COVID-19 Response Fund raises more than \$566,000

Donor impact touches every corner of QEII during global pandemic

By Sarah Murphy

When COVID-19 first struck Nova Scotia in March, the QEII Foundation quickly mobilized to establish the QEII COVID-19 Response Fund.

As of Oct. 2, the QEII COVID-19 Response Fund has raised more than \$566,000 to ensure the QEII Health Sciences Centre and its healthcare teams are equipped and ready, no matter what this pandemic brings their way.

“Even before COVID-19 was here, we knew it was coming and there was massive, massive preparation,” says Chris Fraser, health services manager of the QEII’s COVID-19 Intermediate Care Unit. “We had to restructure units to house potential patients and we started very intense training to ensure we were well prepared.”

During the peak of the pandemic, the QEII COVID-19 Response Fund has been instrumental in funding items that are crucial to help teams navigate the daily challenges of patient care during a pandemic. QEII Foundation donors have not only funded items that are pivotal in ensuring in-hospital safety and timely COVID-19 testing, but also items that allow patients affected by this novel virus to recover safely at home.

One of the first purchases made was 1,000 pulse oximeters for COVID-19 patients. A pulse oximeter clips on a patient’s finger and monitors the percentage of oxygen in the blood, along with heart rate. These pieces of technology are vital in order for patients to be safely monitored at home, as respiratory failure can be one of the more severe symptoms of COVID-19.

Clinical nurse educators Breagh Weatherbee and Maria Collier say this equipment was a crucial part of the team’s response to COVID-19, as it allowed them to send patients from their unit home early and safely.

Not only did this free space and resources within the hospital, but it also helped reduce the risk of infection for both staff and non-COVID-19 patients and allowed the patient to recover comfortably in their own home.

“Staff taught them how to use the pulse oximeters and instructed them to come back if levels dropped to a certain point. Then they were able to manage fine at home,” says Breagh.

As the QEII continued to navigate visitor restrictions, donor funds were able to purchase 62 iPads to support families who have been impacted by COVID-19 protocols. These iPads allow patients and their families to connect virtually and enjoy the comfort of being able to see each other, despite having to spend some time physically apart.

In certain cases, these iPads also provided a more human connection between in-hospital patients and their healthcare teams.

“When we’re in full PPE, it’s hard for patients to get a sense of who’s treating them. It’s like, ‘You can’t see it, but I’m smiling under my mask!’” says Maria. “Video calls helped a lot in making these conversations feel more personal.”

Donors also played an important role in ensuring the QEII’s microbiology lab was



Chris Fraser, registered nurse and health services manager of the QEII’s COVID-19 Intermediate Care Unit, and his team have been on the front lines of care during COVID-19. The QEII COVID-19 Response Fund has been instrumental in funding items that are crucial to help teams like Chris’ navigate the daily challenges of patient care during a pandemic. **Contributed**

able to provide accurate and timely testing results. Donor generosity allowed the QEII to purchase equipment that is crucial for identifying COVID-19 in lab samples.

When samples are submitted to the lab for COVID-19 testing, the genetic material from the virus must be amplified in sufficient quantities in order to be detectable. The donor-supported ABI 7500 Fast Instrument allows the province’s only COVID-19 test lab to do this with incredible speed.

These donors were also able to ensure that QEII teams could care for patients safely with advanced and strategic sterilization procedures. With thanks to donors, the QEII was able to purchase equipment, like a CleanFlow Health Care Unit, which ensures the proper sterilization of N95 masks.

Additionally, the QEII was able to purchase high-speed sterilization technology, such as Moonbeam units, for incredibly fast and effective sterilization of large, high-touch surface areas like patient rooms, operating rooms, bathrooms, equipment and more.

Another key area of impact was the

purchase of handheld, portable ultrasounds. This technology provides accurate clinical assessment and diagnostics without the patient being required to leave their bed. It allows healthcare teams to meet patients at the point of care, make a faster diagnosis and deliver exceptional care wherever it’s needed.

QEII Foundation donors were also able to help fund several crucial and world-leading research studies that will take place at the QEII, providing long-term solutions to pandemic response today and in the future. The QEII Foundation joined forces with the Nova Scotia COVID-19 Health Research Coalition, which was established to rapidly respond to urgent COVID-19 focused research right here in Nova Scotia.

Chris and his team say the community has shown “amazing, overwhelming support” and the impact of those donations continues to be felt in all corners of the QEII every day.

To learn more about the QEII COVID-19 Response Fund and how donors are making a difference, visit QE2COVID19Response.ca.

‘They saved my life’

Team effort key to QEII Burn Unit’s approach to survivor recovery

By Sara Ericsson

Khaled Alsaïd doesn’t remember arriving at the QEII Health Sciences Centre’s Burn Unit, but he remembers the feeling of leaving a second family when he returned home.

The 22-year-old woke up in hospital after having sustained first, second and third-degree burns to more than half of his body, focused on his hands, legs and abdomen.

He says despite the shock of realizing what had happened, the attentive care he received from his care team made him feel at ease, even when his family and friends couldn’t visit due to COVID-19.

“Waking up alone felt really scary because my mind was still processing what had happened. But my doctors and nurses were so incredibly kind to me and told me everything would be OK. Without them, I wouldn’t be here right now. They saved my life,” says Khaled.

Khaled’s Burn Unit team included plastic surgery and intensive care unit physician Dr. Jack Rasmussen, occupational therapist Denise Johnston and psychologist Dr. Sulaye Thakrar. The broader, multidisciplinary Burn Unit team includes surgeons, nurses, nutritionists, a chaplain, social workers, physical therapists and other healthcare professionals, as well as the Nova Scotia Fire Fighters Burn Treatment Society, which raises money for all aspects of Burn Unit care.

The QEII’s Burn Unit treats all patients with major burns from across the Maritimes — about 15

to 25 patients per year.

Dr. Rasmussen says the team immediately begins working from the first hours of inpatient care, as they stabilize the survivor and plan their surgeries and skin grafts. Later, they assess patients’ mental health and occupational and physical therapy needs.

Khaled says this all would have felt overwhelming were it not for his healthcare team, who quickly became like family to him. He says their work not only healed his burns, but helped him to re-learn basic things like sitting, talking and walking again and to feel motivated, even on his darkest days in hospital.

“They helped me to manage my physical and emotional scars and showed me what life really is. That no matter what, I can still be me,” he says.

Denise says the acute care that happens in hospital “is one snapshot in the patient’s whole continuum of care” and that the same Burn Unit team members remain involved in the patient’s care after they’ve returned home from hospital. She says this outpatient care can last anywhere from 12 to 18 months to several years, depending on the survivor and the severity of the burns.

Khaled says his astonishing recovery — he was out in one month despite doctors predicting a 55-day stay — is thanks to the care he received at the QEII. He says his burns were one part of his recovery and that the help he received from Dr. Thakrar helped heal his emotional scars.

“At the time, I was giving up on



In the midst of a pandemic, 22-year-old Khaled Alsaïd woke up in hospital after having sustained first, second and third-degree burns to more than half of his body. Despite the shock of realizing what had happened, the attentive care he received from his care team made him feel at ease, even when his family and friends couldn’t visit due to COVID-19. **Contributed**

everything. The reason I’m back now, emotionally and mentally stronger than before the burn, goes back to them,” says Khaled.

Dr. Thakrar’s work with survivors focuses on the three pillars of psychological management of burns: mental health, scarring and body image, as well as pain and itchiness — all of which helps them process their scarring and new realities.

Another significant part of the survivor’s mental healing is the peer support that comes through the Burn Survivors Group, which pairs each burn survivor with a fellow survivor who understands their journey.

“To have someone who’s been through this experience and can say, ‘I know you’re frustrated, but it will get better,’ that’s a hugely

“*Waking up alone felt really scary because my mind was still processing what had happened. But my doctors and nurses were so incredibly kind to me and told me everything would be OK. Without them, I wouldn’t be here right now. They saved my life.*”

— Khaled Alsaïd

important resource,” says Dr. Rasmussen.

Denise works alongside other occupational and physical therapists throughout the survivor’s recovery, from when they first receive skin grafts to when they are getting used to living at home after hospital, to ensure the best possible function of the areas that sustained burns. She feels continuously inspired by each survivor’s resilience and is glad to be among the numerous healthcare disciplines helping get each survivor back home.

“The journey is lifelong, but what we get to see as the burn care team is the steps where they regained themselves. It’s hard work, so when you see those good outcomes, it’s really rewarding,” she says.

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When we come together as a community, we are at our best. That has been evident these past few months at the QEII Foundation.

Businesses and individuals around us came together to raise funds for vital COVID-19 response efforts.

The QEII Foundation has raised funds to support the patients and staff of the QEII Health Sciences Centre since 1996.

Together, we have raised more than \$250 million to date to make sure we have the best technology, therapies, and care solutions for our families and friends, here at home.

As the largest adult health sciences centre in Atlantic Canada, the QEII is more than a hospital.

It is a place where amazing things happen – organ transplantation, clinical trials, robotic surgeries, medical education and research with global impact.

And that's just naming a few. It is a place of pride, grit, and stories worth telling.

The stories to the right highlight advances in health care made possible by donors.

They represent a few examples of community impact at the QEII this past year, as we say thank you for your support and for helping us provide \$10.3 million to the QEII.

Dr. Emeka Nzekwu
Interventional Radiology Fellow, QEII



[ANNUALREPORT.QE2FOUNDATION.CA](https://www.annualreport.qe2foundation.ca)

QEII FOUNDATION 2020 COMMUNITY REPORT

constant

Rallying for neighbours when they need our support

From t-shirts reminding us to “Stay the blazes home”, to health heroes coffee blends, an 11-year-old fundraiser selling homemade goods, and straight-up donations, our community showed up. Together, you raised vital funds in support of our QEII COVID-19 Response Fund. To our business partners and anyone who donated to the fund, thank you. You brought hope and comfort to patients and staff at the QEII – and showed us that when we come together, powerful things happen.

Individuals across Nova Scotia and beyond raised more than \$566,000 for local response efforts to COVID-19. Below are just a few examples of community impact made for COVID-19 patients and care providers.



VITAL EQUIPMENT

Providing accurate and timely test results by funding equipment for Nova Scotia's only COVID-19 test lab



VIRTUAL CARE SOLUTIONS

Allowing patients to go home sooner – with equipment such as pulse oximeters to monitor blood oxygen levels from home



COMMUNICATION TOOLS

Connecting patients with their families and loved ones through devices such as iPads



RESEARCH COALITION

Fueling medical experts in Atlantic Canada to find innovative ways to respond to COVID-19

Ensuring life-changing cancer care continues

Cancer care never stops, not even for a pandemic. PET-CT offers the most sophisticated cancer imaging available today. Cancer imaging scans continued at the QEII throughout COVID-19. This technology helps medical teams assess the stage and spread of many cancers. It is also used to evaluate a patient's response to treatment, influencing important decisions for their care.

The first patients were scanned on the QEII's new PET-CT in April. Because of donors, the QEII has a best-in-class PET-CT, with extended-field-of-view. This technology detects tiny traces of cancer and is faster, allowing teams to scan 25 per cent more patients each day. Thanks to our donors, we are reducing wait times and improving the patient experience.

In the next phase of evolving diagnostic imaging at the QEII, we will help fund brand new interventional radiology suites. Here, diagnosis and intervention intersect – often in the same procedure – bringing life-saving solutions to patients.

Bringing surgical robotics home

One in seven men will develop prostate cancer in their lifetime. Because of donors, men in our community now have the option of robotic surgical technology, offering greater precision than the human hand.

This technology allows surgeons to remove tumours, leaving patients with minimal scarring – leading to faster recovery and greater quality of life. This technology is already having an impact for patients living with prostate, kidney and gynecological cancers.

At a time of social distancing – when many non-urgent surgeries were postponed – donor-funded surgical robotics technology enabled teams to continue operating. With just over \$400,000 left to raise, we are close to completing this campaign to keep this robot at the QEII.

Riding to reduce cancer treatments from 30 to 1

In 2020, Ride for Cancer powered by BMO Bank of Montreal rose to an epic challenge to raise \$1 million. Riders and event supporters brought the QEII one step closer to introducing a new, world-class procedure – a breast seed brachytherapy program. This program will reduce the number of treatments required for some early stage breast cancer patients, from 30 to one, in one tiny dose.

Despite challenges brought on by the pandemic, the event saw record-breaking uptake this year – and surpassed its goal by raising \$1.26 million net and counting. On October 3, Riders faced the fight against cancer along the road and trail. While the event looked different than in previous years, the team was committed to delivering a safe and memorable event experience to our Ride community. To learn more, visit yourrideforcancer.ca.

For more stories of community impact in health care, visit annualreport.QE2Foundation.ca.

On the front lines

QEII's microbiology lab plays leading role during pandemic

By **Joey Fitzpatrick**

The Diagnostic Microbiology Laboratory at the QEII Health Sciences Centre plays a vital role in Nova Scotia's healthcare system.

As one of the largest facilities of its kind in the world, the lab provides all of the microbiology diagnostic services in the province. For the most part, the microbiology team does this vital work in relative obscurity. But this year they were on the front lines in the effort to contain the spread of COVID-19 in Nova Scotia.

"In microbiology, we're always trying to prepare for the next emerging pathogen," says Dr. Todd Hachette, chief of service and division head for microbiology. "In early February, when we started to see a growing number of cases outside of China, it became clear that this was not going to be a localized event and that we were in for a big problem."

Encompassing more than an entire floor of the QEII's Mackenzie Building, the team has processed COVID-19 test swabs from across the province. In the early stages of the pandemic, they were also processing tests for Prince Edward Island and Saint Pierre and Miquelon.

Staffing numbers grew from 60 to almost 80 during the pandemic, with positions including medical laboratory assistants, medical laboratory technologists, physicians, clerical staff and management.

"It was a collaborative response," says Dr. Hachette. "We were able to draw from other divisions

within the department."

Staffing hours were also increased substantially. In the pre-COVID-19 world, the lab had a fully staffed day shift and then an evening shift with reduced staff numbers.

"We realized pretty early on that we were going to have to move to a 24-hour model," says Charles Heinstein, the technical manager of microbiology. "As it happens, much of the work was coming in later in the day, so we added a lot more staff on the evening shift and began operating 24 hours, seven days a week."

At the peak of the pandemic, the lab was processing some 1,500 samples each day. Between March and August 2020, the lab processed 80,000 tests, helping Nova Scotia to flatten the curve.

Clarissa DeCoste has been a medical laboratory technologist at the lab since 2015 and she experienced this increased workload up close.

"Our work queues, which tell us how much work needs to be done, used to be between 30 and 80 tests," she says. "Now, it's anywhere between 300 and 600 tests."

Besides the increase in staff, the introduction of new equipment for extracting genetic material from the samples was key to being able to handle the increased workload. As part of the QEII COVID-19 Response Fund, QEII Foundation donors helped make the purchase of this type of equipment possible.

"It takes us less time to process the specimens," says Clarissa.



“We need to be prepared so there are no shortages in terms of testing or swabbing.”

– Charles Heinstein

Charles Heinstein, technical manager, and the team at the QEII's microbiology lab usually do their vital work in relative obscurity. In 2020, they became known for their efforts to help contain the spread of COVID-19 in Nova Scotia. **Contributed**

"That allowed us to decrease the turnaround time by half."

"This new equipment can also be used to deal with any pandemics that may emerge in the future," says Dr. Hachette.

The lab has a number of specialized areas, including bacteriology, virology, special pathogens, and a Level 3 lab that deals with tuberculosis. On a typical day, the lab receives samples from both inpatients and outpatients from within Nova Scotia and outside the province.

"We get a very large range of samples, including blood, tissues, urine, respiratory samples, as

well as swabs testing for many different things, like sexually transmitted infections," says Charles.

The last major pandemic to affect Canada was the H1N1 flu in 2009. Charles says every pandemic provides valuable lessons for dealing with future outbreaks.

"With every pandemic, there is a walk-through afterwards," he says. "We look at the supplies we will need to have on hand for the next outbreak. We also look at how we do the work to produce the amount of testing that will be required."

The lab is now stockpiling

supplies and preparing staff to be ready for a potential second wave of COVID-19.

"There's a lot of operational planning," says Charles. "We need to be prepared so there are no shortages in terms of testing or swabbing. We also need to have sufficient staff hired and trained for that October-November window."

Playing a key role in the fight against COVID-19 does bring an increased level of job satisfaction, adds Clarissa.

"People can now see the value we bring to the healthcare system and they appreciate the work we do."

Life after two robotic cancer surgeries

Donor-funded technology improving care during COVID-19 and beyond

By **Nicole Topple**

Just seven weeks after her second robotic surgery for kidney cancer, Agnes Rendell was back playing the game she loves.

An avid golfer, the Eastern Passage resident is still amazed by her "quick and exceptional" recovery and the QEII Health Sciences Centre's surgical team who saved her life.

In March 2020, Agnes received a shock diagnosis: an eight-centimetre tumour in her right kidney and a seven-centimetre tumour in her left. The news was the last thing the then 62-year-old expected; she was extremely active, healthy and in the best shape of her life.

"In that moment, I thought my life was over," says Agnes.

What followed was a whirlwind: a series of phone calls, a referral to the QEII and a consultation with her would-be robotic surgeon, Dr. Ricardo Rendon.

"When he first mentioned robotic surgery, I immediately imagined something out of a cartoon or sci-fi movie," says Agnes. "But I had complete confidence in my surgeon and the team."

Agnes underwent her first robot-assisted surgery in early March — a partial nephrectomy to remove the cancerous tumour in her right kidney. Six weeks later, she underwent the same procedure for her left, but this time during the peak of COVID-19.

"My second surgery felt like it happened in a different lifetime," says Agnes.

Despite the additional stress and uncertainty that goes hand-in-hand with cancer surgery during a global pandemic, Agnes says that QEII teams went above and beyond to make her feel

safe and supported during her experience.

"Everyone from the nurses and administration to the team who operated on me were extraordinary," says Agnes.

Heralded as one of the most effective tools to treat certain cancers, robot-assisted surgery enables movements so tiny and precise that they would not be possible with the human hand alone.

"It's optimal for delicate procedures," says Dr. Rendon, like partial nephrectomies — often referred to as kidney-sparing surgeries — that remove the tumour while leaving as much healthy kidney tissue as possible.

Due to the size and position of Agnes' tumours, Dr. Rendon knew robot-assisted surgery was the best option for his patient.

"This was one of the most complex and complicated cases I've ever experienced in my entire surgical career," says Dr. Rendon. "Robotic surgery was the clear solution."

During both of her robotic kidney surgeries, Dr. Rendon sat a few feet away from Agnes at a computer console, operating robotic arms with precision far beyond what a human hand can offer.

As the surgery itself is performed using very small incisions, it significantly reduces recovery time, pain, risk of infection, scarring and more. The end result is patients, like Agnes, can return to their daily lives with a minimum of inconvenience, despite having undergone major cancer surgery.

"The fact that seven weeks after her last surgery, Agnes was playing golf is a testament to

this advanced technology and its benefits," says Dr. Rendon.

Thanks to QEII Foundation donors, Atlantic Canada's first surgical robotics technology arrived at the QEII in February 2019. Since then, more than 200 robotic surgeries have been performed, including the two that saved Agnes' kidneys.

The \$8.1-million project will be entirely donor-funded, with just more than \$400,000 left to raise to keep the technology at the

“

This was one of the most complex and complicated cases I've ever experienced in my entire surgical career. Robotic surgery was the clear solution.

– Dr. Ricardo Rendon

”

QEII and expand its use to other cancer surgeries.

When asked what she would say to the generous donors who introduced this treatment option to our region, Agnes feels like a simple thank you just isn't enough. "There's no question that the QEII's surgical robotics program saved my life. We're so grateful."

To help ensure surgical robotics is here to stay, donate today at QE2Robotics.ca.



Agnes Rendell pictured with her son, Jesse (left), and husband, Keith (right). Seven weeks after her last robotic surgery for kidney cancer, Agnes was back to playing golf. **Contributed**

Seeds of hope

QEII to offer new breast cancer treatment

By Allison Lawlor

Using radioactive seeds that are smaller than a grain of rice, breast seed brachytherapy is a relatively new treatment for breast cancer patients. This treatment will not only allow patients to spend less time away from home receiving treatment, but also ensure the QEII Health Sciences Centre remains a centre of excellence in cancer care for Atlantic Canadians.

In the coming months, Dr. Jean-Philippe Pignol, the QEII's head of radiation oncology, will offer breast seed brachytherapy to some early-stage breast cancer patients, all thanks to QEII Foundation donors, and event participants and supporters of *Ride for Cancer* powered by BMO Bank of Montreal.

"We want to make a patient's challenging journey simpler and faster, making them feel better and more reassured about their outcome in the future," says Dr. Pignol.

The innovative form of radiation therapy treatment is delivered in a single procedure that lasts less than one hour.

During the procedure done under light sedation and local freezing, Dr. Pignol places between 10 and 20 needles into the breast, where a lump was previously removed. Each needle is loaded with about four tiny titanium radioactive seeds, which are then placed into the breast. The seeds release soft radiation over a period of two months, explains Dr. Pignol.

"The seed is the most convenient treatment," he says. "It is the less risky of treatments for the patient in term of exposure to radiation."

Radiation in the seeds is delivered to a small area of the breast and precisely pinpointed, so as not to leak into other parts of the body. The limited radiation exposure reduces the patient's risk of lung cancer and other diseases and allows for greater preservation of the breast, he says.

At the end of two months, the seeds remain in the breast, but they are without radiation. They are so small that the patient cannot feel them. Patients are followed up as usual with routine mammograms.

For Pauline Sykes, the treatment meant that instead of facing three to five weeks of daily radiation treatment and long trips from her home in Toronto to the city's cancer care centre, she made one trip to

“We want to make a patient’s challenging journey simpler and faster, making them feel better and more reassured about their outcome in the future.”

– Dr. Jean-Philippe Pignol

the hospital and was back home the same day as the procedure.

In 2006, after her surgeon removed a lump in Pauline's right breast, Dr. Pignol implanted 62 seeds into her breast at Toronto's Sunnybrook Health Sciences Centre while she was awake listening to Rod Stewart songs on her headphones.

"It was the simplest procedure and the safest procedure I've ever had in my life," says Pauline. "I had an amazing experience from the beginning to the end."

By receiving this more convenient, shorter form of treatment, Pauline felt less stress and could begin her healing journey faster. She was back to work a few days after the treatment.

"Cancer patients say, 'I want to go back to my normal life as soon as possible,'" says Dr. Pignol. "That's where we can help."

Seed brachytherapy has been used widely to treat prostate cancer patients, but it is new for breast cancer. After inventing the procedure for breast cancer patients, Dr. Pignol first performed it in 2004. Since then, he has done the procedure on more than 200 patients in Toronto and in Europe.

"We know it is efficient. We know it is safe," says Dr. Pignol, who has published long-term data on patient outcomes.

Dr. Pignol envisions performing the procedure on between 30 and 50 patients with early-stage breast cancer in the first year at the QEII and increasing the number in subsequent years.

QEII Foundation donors, event participants and supporters played a major role in securing this leading treatment for the QEII.

The sixth annual *Ride for Cancer* powered by BMO Bank of Montreal took



Leslie Keevill, a six-year breast cancer survivor, is hopeful breast seed brachytherapy will improve the quality of life for many women. Shown here at the 2019 Ride for Cancer powered by BMO Bank of Montreal, Leslie has participated in the event for three years and is proud to raise money for cancer care here at home. **Contributed**

place on Oct. 3, 2020. Hosted by the QEII Foundation, the event introduced new safety protocols amid COVID-19 to keep riders and the community safe. The event raised more than \$1.26 million net, and counting, to advance cancer care locally and deliver new treatments. A portion of those proceeds will help bring breast seed brachytherapy treatment to the QEII.

Among this year's riders was Leslie Keevill, a six-year breast cancer survivor.

For the third year, Leslie and her husband rode alongside a community of riders to raise money for cancer care here at home.

Having undergone a mastectomy, chemotherapy and 25 rounds of radiation, Leslie is hopeful breast seed brachytherapy will improve the quality

of life for many women.

"To have this kind of treatment available, for anyone who qualifies, will make a huge difference," she says. "I think it is incredible."

Ensuring the QEII has the best treatment options available to women is essential. In 2020, an estimated 27,400 women in Canada will be diagnosed with breast cancer, which represents 25 per cent of all new cancer cases in women this year. With good diagnoses and the continual improvement of treatment and care, Dr. Pignol says there is much reason for hope.

"Cancer today should never be a penalty, should never be a life sentence. Diagnosis of cancer should be done early and treatment should be delivered fast and be minimally invasive."

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A team of QEII radiologists tripled community donations for a new PET-CT scanner at the QEII. The new scanner, which arrived just as COVID-19 began to affect the province, has extended field-of-view technology and can detect tiny traces of cancer. **Contributed**

New technology making a big difference in cancer care

PET-CT helps reduce wait times, provides more accurate diagnoses for patients

By **Jon Tattrie**

A new PET-CT scanner has increased the number of patients the QEII Health Sciences Centre can see for an important cancer test.

PET-CT combines the technologies of a positron emission tomography (PET) and computerized tomography (CT). While a CT scan provides images of internal organs and tissues, PET shows cellular information to highlight abnormalities in cell function, such as cancer.

More than 1,200 patients have been scanned on the new PET-CT since opening in April 2020 and even the COVID-19 pandemic did not disrupt the new machine's performance.

For many types of cancers, PET-CT scans are the most accurate imaging test to determine the extent of cancer spread at diagnosis, show the cancer's response to therapy and identify possible cancer recurrence. A PET-CT scan often finds cancer

not seen on other imaging tests and is currently used for the management of more than 2,500 patients every year at the QEII.

The province of Nova Scotia and the QEII Foundation came together to buy the new scanner, dramatically reducing wait times for those in need of this life-saving service.

To inspire community support, QEII radiologists came forward with a \$50,000 matching gift — tripling donations to a total impact of \$150,000 toward the new scanner.

The new PET-CT has a longer bed, so the entire body can be scanned without moving the patient mid-procedure.

Dr. Steven Burrell, head of nuclear medicine and PET at the QEII, says patients get injected with a radioactive tracer, which is actually just a form of sugar, and most cancers absorb the sugar. When the patients get into the scanner, it detects that tracer

and therefore shows the size and location of the cancer. It can also carry out some tests for dementia and heart conditions.

He says the machine looks similar to the old one — at least on the surface.

"They're now digital detectors, which means they're much more efficient. There are two advantages to that," Dr. Burrell says. The first is that instead of about 30 minutes per scan, it takes about 20 minutes. That adds up to three patients per hour instead of two. "That's extremely helpful because our wait-lists are tight," he says.

Jennifer Hiltz, a PET-CT technologist, says the process can be an uncomfortable experience for patients. They have to stay calm, breathe steadily and be still, sometimes with their hands stretched over their head.

"Their level of anxiety is already high because they're either dealing with a new diagnosis of cancer

or they're post-treatment and wondering if it's worked. The PET-CT test will give them that information," she says.

"When you're talking about saving a few minutes here and there on every patient, by the end of the day that works out to scanning more patients than we previously could do."

The second advantage of the new technology is much better resolution, allowing detection of smaller areas of cancer with greater confidence. This helps ensure cancer patients receive the most appropriate treatment for their cancer situation.

Ami Richardson agrees. She had her PET-CT on the previous machine after a first round of chemotherapy for Hodgkin's lymphoma, but the images were inconclusive. Faced with the choice between more intensive treatment and waiting and seeing, she chose the latter. It turned out she had to go through another

round of treatment.

"If we had had access to that new machine, it probably would have been able to give a much clearer image and decisively say, 'There's still some left,'" she says.

The better results and reduced waiting lists are good news for patients, she says. As for herself, she is "doing great" after undergoing more treatment.

The team also devised an innovative way to ensure the PET-CT program at the Health Sciences Centre in St. John's, N.L., could remain open and operational during the pandemic.

The radioactive substance the PET-CT uses to operate is known as FDG (fluorodeoxyglucose). The QEII uses FDG that is created using a donor-supported cyclotron within the QEII. FDG will decay within a matter of hours, meaning the time spent from production to medical use is limited, making every second critical.

The advanced technology of the new PET-CT requires less FDG to operate than the previous model, meaning the team had additional resources to spare for patients in Newfoundland and Labrador when that province faced a shortage.

This meant Newfoundlanders and Labradorians could continue their care at home and it prevented them from having to fly to Halifax and visit the QEII during the peak of the pandemic — something that would be a risk for any individual, but particularly someone living with cancer.

"When COVID-19 interrupted direct flights from Toronto to St. John's, the Health Sciences Centre in St. John's, Newfoundland was unable to reliably acquire FDG, the radioactive substance that a PET-CT uses to operate," says Brian Martell, the senior director of diagnostic imaging at Nova Scotia Health.

"Sending FDG to the hospital in St. John's three times a week prevented their program from shutting down and allowed them to continue scanning local cancer patients."

Without donors, the QEII would not have a best-in-class PET-CT scanner. Cancer patients locally benefit from the most cutting-edge technology when our community rallies to support it.

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A team at the QEII and Dalhousie University, using research methods and software tools only available in Halifax, found that people with bipolar disorder and more extensive leakage to the blood-brain barrier had more severe depression and anxiety and were more resistant to medicines used to treat the disorder. The high-resolution results of patient scans from the QEII's 3T MRI – funded by the QEII Foundation – allow for precisely detecting blood-brain barrier leakage. **Darren Hubley**

Linking biology and psychiatry

Halifax's world-leading study connects blood-brain barrier leakage and bipolar disorder symptoms

By **Allison Lawlor**

A unique collaboration between medical experts is leading the way to curing the most severe cases of bipolar disorder, a mental health condition that causes extreme mood swings between mania and depression.

Dr. Cynthia Calkin, a psychiatrist at the QEII Health Sciences Centre and associate professor at Dalhousie University, and Dr. Alon Friedman, the Dennis Chair in Epilepsy Research at Dalhousie University and professor in the Department of Surgery at the QEII, imaged the brains of patients with bipolar disorder using a new MRI technique.

They found that those with more extensive leakage in the blood-brain barrier had more severe depression and anxiety, a more chronic, worsening course of bipolar disorder and poorer overall functioning.

"It looks like we have discovered an underlying mechanism that is associated with more severe forms of bipolar disorder," says Dr. Calkin.

Normally, the blood-brain barrier is a boundary that protects the brain from potentially damaging toxins and pathogens. When leaky, certain chemicals and proteins can enter the brain and cause inflammation.

This was the first time in the world psychiatric patients had their brains imaged in a study to look at the leakiness of the blood-brain barrier.

"It is a completely new concept in psychiatry to look at a psychiatric illness in this way," says Dr. Calkin, the founder of the QEII's Mood and Metabolism Program. "It looks like targeting the blood-brain barrier may be a new way of getting people well," she adds.

Bipolar patients who had more leakiness to the blood-brain barrier were also found to be insulin resistant. Insulin resistance is associated with inflammation in the body, causing the barrier to become leaky, having a direct effect on the brain.

Treating insulin resistance in these bipolar patients may soon pave the way for a new treatment strategy.

"In a case study, reversing insulin resistance healed the blood-brain barrier in a relatively short period of time," says Dr. Calkin. "After 12 weeks of treatment with metformin, an insulin sensitizing drug, the patient's depression went into remission and their blood-brain barrier was no longer leaking. Previously, this patient had failed to respond to other psychiatric treatments and had remained unwell for many years."

Bipolar disorder affects up to five per cent of the population. Mood-stabilizing medications, like lithium, help some patients go into remission but others don't respond well to these medications and see their symptoms worsen, often leading to severe depression and greater risk of suicide.

What causes bipolar disorder to progress and who is more at risk hasn't been well understood. Dr. Calkin is excited their study sheds light on these questions by showing a clear link between blood-brain barrier leakage and more severe bipolar disorder symptoms. The study highlights the potential of using brain imaging as a biomarker for identifying the patients who will progress to more severe forms of bipolar disorder, she says.

By identifying a biological cause of the psychiatric disorder, Dr. Friedman believes they can address another serious problem: the stigma surrounding bipolar disorder.

"Often, depression is not seen as a biological disease," he says. "It helps patients know that the disease is not their fault."

For the past 15 years, Dr. Friedman and his team have looked at what happens with the brain when the blood-brain barrier is leaky. Using new MRI and EEG techniques to identify leaks and their functional consequences, they have found leakiness in the brains of patients with different

conditions, including those who have suffered a brain trauma, a stroke and epilepsy.

Dr. Chris Bowen, a research scientist in Dalhousie University's Department of Diagnostic Radiology, is confident that new MRI techniques developed by Dr. Friedman's team to image blood-brain barrier integrity will help advance new treatments for patients with bipolar and other cognitive disorders.

"These tools have made a difference at how we are looking at diseases like lupus and bipolar disorder," says Dr. Bowen.

To detect leakage in the blood-brain barrier in bipolar patients, they developed a much slower MRI scan that is sensitive to subtle blood-brain barrier damage. An image is collected every 20 seconds for about 20 minutes for a bipolar patient, compared to scanning for two minutes for a cancer patient, where blood-brain barrier damage is much more severe.

Using research methods and software tools pioneered by Dr. Friedman's group, in collaboration with the Biomedical Translational Imaging Centre team at the

“

Often, depression is not seen as a biological disease. It helps patients know that the disease is not their fault.

– Dr. Alon Friedman

”

QEII, patients are scanned on a 3T MRI. With the initial 3T MRI infrastructure funded by the QEII Foundation, including a \$2.5-million gift from the Gauthier and David families, the research scans allow very sensitive detection of blood-brain barrier leakage, which is not visible in normal clinical MRI imaging of these patients.

Dr. Calkin is hopeful that, in the future, MRI imaging will not only be used to determine the effectiveness of treatment and predict disease trajectory but also as the first diagnostic tool in psychiatry.

"It has that potential, but this will take much more research," says Dr. Calkin. She and Dr. Friedman continue to work collaboratively. They are now studying patients with psychosis and other psychiatric conditions.

"We are testing existing drugs and new drugs that would target the blood-brain barrier. We hope we will have new treatments that will not only be treating the symptoms of the disease, but the cause of the disease," says Dr. Friedman. "The chronic disease can be cured because we are treating the cause of the disease."



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Research meets community

Equitable, culturally specific heart health for African Nova Scotians

By **Sara Ericsson**

A project combining cardiovascular research data with community involvement is on its way to revealing how Nova Scotia's healthcare system can address systemic biases — such as lack of cultural representation in the medical field, cultural bias and discrimination — to ensure the accessibility and delivery of equitable care to African Nova Scotians.

The project, a first in Canada, is led by Dr. Christine Herman, a cardiac and vascular surgeon at the QEII Health Sciences Centre, and Sharon Davis-Murdoch, co-president of the Health Association of African Canadians (HAAC). Dr. Herman approached HAAC after noticing persons of African ancestry arriving at her clinic with advanced stages of cardiovascular — or heart and blood vessel — disease at relatively young ages.

In the U.S., statistics suggest that Persons of African Descent have the highest rate of high blood pressure in the world, are six times more likely to die of heart disease, are four and a half times more likely to die of stroke, have double the rate of diabetes and are one and a half times more likely to die of peripheral vascular disease.

Dr. Herman proposed to HAAC that they team up to combine research with community involvement to look deeper into this health disparity. With \$17,000 in funding from

the Maritime Heart Centre Innovation Fund through the QEII Foundation, Dr. Herman began looking into the issue.

"I saw a huge disparity of outcomes. I showed the HAAC the data of admission and surgical rates for cardiovascular procedures and proposed we look at whether a disparity exists between access to care versus what is being delivered," says Dr. Herman.

Soon after, the Dartmouth General Hospital Foundation proposed a research project to TD Bank Group focusing on cardiovascular care in the Preston Township. The project is able to build on Dr. Herman's former work collected from hospital admission databases and the Canadian long-form census. The initial data included hospital admissions, risk factors and death rates linked to cardiovascular disease rates in African Nova Scotians.

This information was gathered as part of a larger study in collaboration with Dr. Michael Dunbar, QEII orthopaedic surgeon, director of Dalhousie University's Department of Surgery Research and QEII Foundation Endowed Chair in Arthroplasty Outcomes, and Lynn Lethbridge, data scientist for the QEII Foundation Endowed Chair in Arthroplasty.

"The new research opportunity allows us to open up the system's vision to include determining factors like income, proximity to healthcare services, housing,



Dr. Christine Herman (right), cardiac and vascular surgeon at the QEII, along with Sharon Davis-Murdoch (left), co-president of the Health Association of African Canadians (HAAC), and Preston Simmons (centre), Community Committee chair, are working together to determine how Nova Scotia's healthcare system can address systemic biases to ensure the accessibility and delivery of equitable care to African Nova Scotians. **Contributed/QEII Foundation**

food security and education to look at how these impact access to health care and your resulting outcome. There is also systemic racism, unconscious bias and the system itself to consider," says Sharon.

This second community project, funded through TD Bank Group, is entitled the DGH African Nova Scotian Heart Health Outreach Program. It will use a committee structure with five pillars, including faith, community, research and health policy, and history. Each pillar is supported by a committee that will bring each perspective to the table.

Community Committee chair Preston Simmons says connecting research data with community interpretation acknowledges the importance of the knowledge and experience of African Nova Scotians.

"It gives people an opportunity to speak, be educated and educate as well. A lot of times, those

“*It's very important that people see that their community has a presence in this and that the leaders are people they know, who they can trust.*”

– Preston Simmons

opportunities aren't provided to them. It's very important that people see that their community has a presence in this and that the leaders are people they know, who they can trust," he says.

Dr. Herman says this second project will continue what the first project started: finding an answer to how the accessibility and delivery of equitable health care can be ensured for African Nova Scotians and that community participation in healthcare decision-making is key to finding sustainable progress.

"Having community members interpret the data in context of their lived experience is so important but is something that's not frequently done in clinical outcomes research. This committee structure ensures so much community involvement at every level," Dr. Herman says.

"This is our opportunity to bring everyone together to make sure we're all working together on this."

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Building a foundation for success and support

National diabetes study putting early, aggressive control to the test

By **Colleen Cosgrove**

A newspaper ad and a phone call sent a Nova Scotia man's life in a fresh, healthy direction. And at 48 years old, Andrew F. of Cole Harbour says the redirect came at a pivotal time.

Andrew had just been dealt a surprise Type 2 diabetes diagnosis and was left unsure exactly what his prognosis meant for the long-term and which habits needed changing. He at once worked to change his diet and exercised a bit, but with minor impact. He ultimately required medication to bring down his sugars.

"I tried, but with limited knowledge on what to be doing, it didn't work out all that well," says Andrew. "I kept at it and was just hoping for the best and then it all turned around for me."

Andrew spotted a newspaper ad for a national study, sponsored by the Population Health Research Institute (PHRI), being conducted locally by endocrinologist Dr. Thomas Ransom and his peers at the QEII Health Sciences Centre. Dr. Ransom's research group are the top recruiting site Canada-wide and are among eight university and community-based research sites from Alberta to Nova Scotia.

The national study, approved by the Nova Scotia Health's Research Ethics Board, is looking for participants — diagnosed with Type 2 diabetes in the past five years, 30 to 80 years old and not

currently on insulin as part of their treatment.

Along with standard diabetes medications, all participants receive lifestyle interventions focused on coaching, diet and exercise, and their sugars are watched closely. The study hopes to show that early aggressive sugar lowering can rest and ultimately reset the pancreas so that medications can be pulled back. Ideally, the rested pancreas can function normally or keep sugars down for a prolonged period afterwards.

"It didn't take me long to see the benefits of participating," says Andrew. "It's nice to have a support system filled with experts; they are encouraging, supportive and they're just as driven to see me succeed as I am."

Dr. Ransom says the extra attention and level of personalized diet and nutrition training participants receive is meant to create the foundation for the individual's long-term success. It is also part of a movement in health care to focus on early intervention — or what Dr. Ransom calls "move upstream" — with the goal of reducing dialysis, amputation and blindness that can occur as Type 2 diabetes progresses.

The "dream results," Dr. Ransom says, would be to show that an aggressive regimen can slow down or stop the progression of the disease and the burden

of diabetic complications on patients.

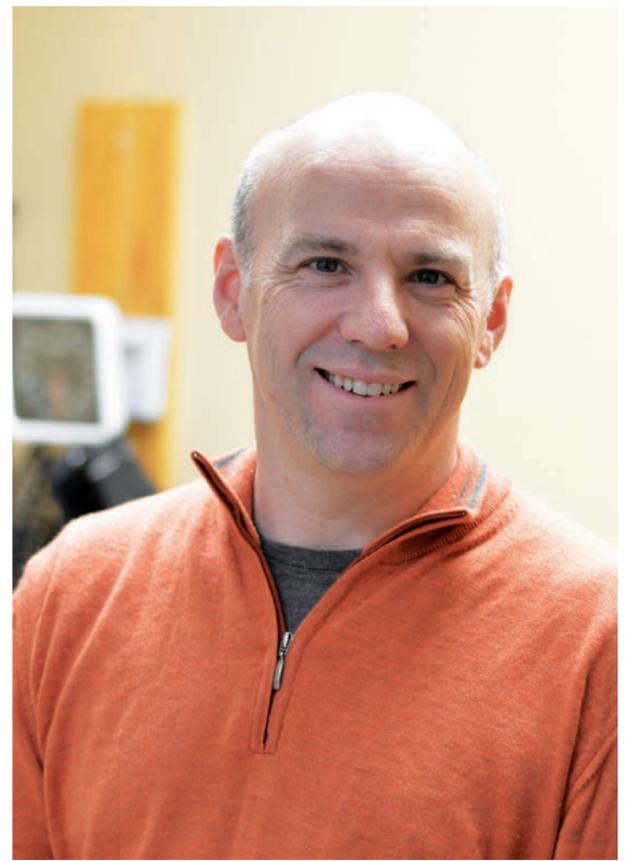
People with Type 2 diabetes have insulin resistance which means that their insulin can't bring down their sugars. It is the high sugars that causes the damage. Strategies to bring down sugars include medications to help improve insulin sensitivity or to give extra insulin.

In 2017, 2.3 million Canadians were reported being diagnosed with diabetes.

In summer 2020, Andrew was in week 28 of the 16-month study and confident that his lifestyle has changed for the better and permanently.

With the pandemic sending much of the workforce home, Andrew's job also transitioned to a home office. But the timing, he says, could not have been better. Being home and quarantined allowed Andrew to focus on his fitness, take extended walks with his fiancée and their Rottweiler companion, Slayter, and make eating better and exercising a daily priority. He has lost more than 35 pounds to date and says he now realizes how unhealthy he was previously.

"I thought I felt good before, but I realize now that I was just used to feeling that way," says Andrew. "A healthy diet and plenty of exercise is all your body wants. All the health gurus talk about it and it's true. Through



QEII endocrinologist Dr. Thomas Ransom and his peers are leading the local portion of a national study aimed at early intervention for diabetes and creating a foundation for the individual's long-term success. **QEII Foundation**

“It's nice to have a support system filled with experts; they are encouraging, supportive and they're just as driven to see me succeed as I am.”

— Andrew F.

healthy eating and exercise, I've changed how my body is reacting to insulin.”

For Andrew, living with Type 2 diabetes has turned from a scary, uncertain thing to a condition that he can manage through diet, exercise and the knowledge, training and support he's learning as a study participant.

Dr. Ransom hopes that with such an approach, including early aggressive medical management

and behavioural changes, more patients like Andrew will not only be able to come off their diabetes medication but stay off for a prolonged period of time with less complications.

For more information or to participate in the study, please contact Blaine Gallant, research co-ordinator, at blaine.gallant@nshealth.ca or 902-473-3299.



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Katrina Boudreau - QEII interventional radiology technologist

Face recognition technology intersects medical diagnosis

New AI-based mobile app to help identify acromegaly earlier

By **Allison Lawlor**

If her rare, slowly progressive hormonal disorder had been diagnosed 20 years earlier, Janet Cameron knows she wouldn't have lived with extremely large hands and feet for so long, or other painful medical conditions and their resulting surgeries.

Looking back, Janet started seeing symptoms of acromegaly — a hormonal disorder that develops when the pituitary gland produces too much growth hormone during adulthood — in 1974, after the birth of her child.

"It wasn't something you could pinpoint," says Janet, a retired intensive care unit nurse. "It was affecting my entire body."

She had urinary issues for more than 20 years that led to painful kidney stones and she underwent a pyeloplasty — a reconstruction of the narrowed ureter, a tube that carries urine from the kidney to the bladder. There were also gradual changes in the shape of her face, including a protruding lower jaw and brow, a large tongue and a deep, husky voice.

Acromegaly usually causes the bones in the feet, hands and face to grow in adulthood. Janet blamed her big hands on her father's side of the family; her ring size went from a seven to an 11 and her feet grew so big that she could only wear extra-wide men's running shoes.

But it wasn't until 2019, when she underwent emergency heart surgery at the QEII Health Sciences Centre to clear several blockages, that a doctor started

piecing together her long, complicated medical history.

A blood test was ordered to check her growth hormone; the results led her immediately to the QEII's endocrinology team. A tumour causing an excess amount of growth hormones in the pituitary gland area was discovered and removed by Dr. David Clarke, QEII neurosurgeon, in late January 2020.

"They saved my life," says Janet.

Dr. Ali Imran, an endocrinologist at the QEII's Halifax neuropituitary clinic, says that Janet is not alone. Patients with acromegaly typically start having symptoms 10 to 15 years before they are diagnosed.

"The changes that typically occur are slow and subtle but are still causing harm," says Dr. Imran. "There are many out there who have the disease but don't know it."

The Halifax neuropituitary team, including Dr. Imran and Dr. Clarke, want to change that. Understanding that mass screening through blood tests is expensive, the team are developing other strategies for early diagnosis.

"The disease causes high morbidity," says Dr. Imran. "The best approach is to diagnose the disease early on."

Dr. Imran and his team, who see between three and five new patients with acromegaly each year and follow 100 patients with the disorder in Nova Scotia, previously developed a visual

scale to help doctors assess changes to a patient's facial features, to determine if the changes were early or advanced.

The team turned to Dr. Raza Abidi, a computer science professor at Dalhousie University and director of health informatics, to help develop patient-centred early diagnosis tools using artificial intelligence based facial recognition. A mobile app that patients can access on their mobile phones to detect changes to their facial features is now being developed.

"It could point to how the disease is actually progressing," says Dr. Abidi. "Patients can regularly self-monitor their facial features to detect acromegaly-related abnormalities."

Once fully developed, the mobile app will allow patients to take front and side images of their face. Those images would then be analyzed and compared with several previous facial images of the patient, along with images of other patients with the disease and those without the disease to detect changes to the patient's facial features.

"It increases the accuracy of determining the level of the facial distortion," says Dr. Abidi. "Now, to a large extent, we are taking out the subjectivity."

Once the mobile app is fully developed and being used next year, Dr. Imran's plan is to conduct a study on a larger population to test its efficacy in detecting cases of acromegaly



Following emergency heart surgery in 2019 and a second surgery to remove a tumour on her pituitary gland in early 2020, Janet Cameron of Antigonish, N.S., is back on the golf course. It was this health emergency that led to Janet's acromegaly diagnosis four decades after her first subtle symptoms. **Contributed**

“

They saved my life.

– Janet Cameron

”

earlier, to help prevent patients like Janet from developing medical conditions that can be caused by the disorder, such as coronary artery disease, sleep apnea and abnormal enlargement of certain organs.

"It will allow us to diagnose and treat more patients earlier," says Dr. Imran.

For Janet, that is good news. She hopes others can be spared

the years of suffering she endured. But instead of looking back, she is looking ahead to a healthier life now that her tumour is gone and her acromegaly has been diagnosed.

Having kept her sense of humour throughout her years of painful medical problems, she is appreciating the small, everyday things she now enjoys: daily, hour-long walks with her husband in Antigonish, climbing dozens of stairs and golfing nine holes.

"Getting rid of this tumour, I'm realizing how abnormal I was," she says with a laugh.

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