FEATURE REPORT: DEVELOPMENTS IN TELEHEALTH – SEE PAGE 18

Publications Mail Agreement #40018238

TWENTY-FIVE YEARS

CANADIAN
Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION SYSTEMS IN HEALTHCARE | VOL. 25, NO. 7 | OCTOBER 2020

INSIDE:

DIAGNOSTIC IMAGING
PAGE 15

App for COVID-19 info
An app called COVID AI KnowledgeEnable uses artificial intelligence to find the latest peer-reviewed articles that answer the questions of physicians, researchers and the public.
Page 4

Virtual check-in
Northern Health, in British Columbia, has introduced a service that allows patients to remotely check into labs and other services, so they can physically show up minutes before the actual appointment.
Page 6

Virtual nursing
Nurses are using smartphones and innovative software to virtually check up on groups of patients living in the community. The system enables one nurse to effectively manage scores of patients.
Page 10

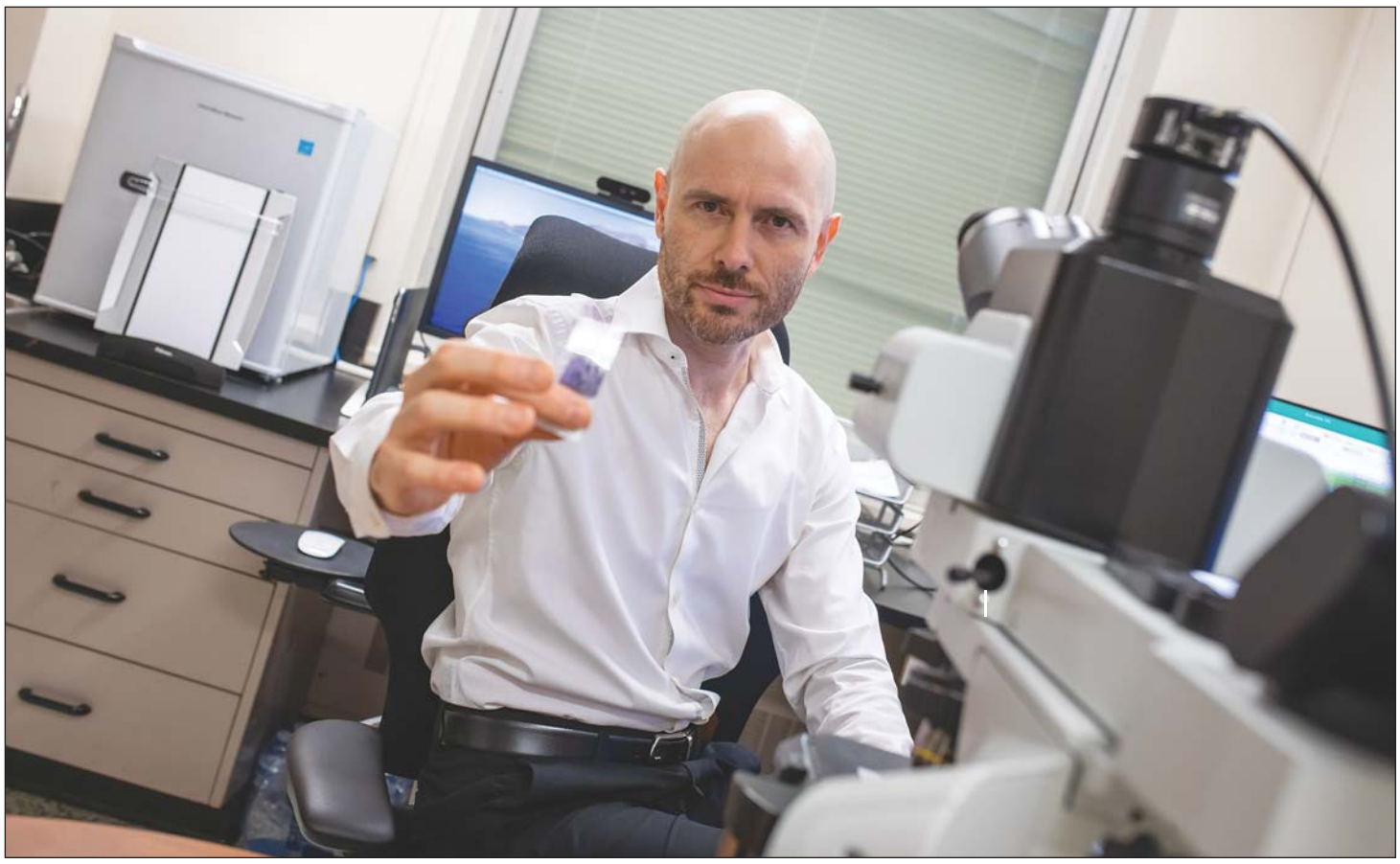


PHOTO: COURTESY OWEN THOMAS, HAMILTON HEALTH SCIENCES

Hamilton Health Sciences adds AI to pathology

Dr. Clinton Campbell, a pathologist at Hamilton Health Sciences, is leading a one-year-long project to digitize slides and apply machine learning to help doctors better detect tell-tale signs of disease. He and his colleagues are focusing on blood and marrow pathology slides in this test, and applying machine learning technology to blood disorders like leukemia, lymphoma and myeloma. **SEE STORY ON PAGE 4.**

Mackenzie Health becomes a leader in digital pathology

BY JERRY ZEIDENBERG

RICHMOND HILL, ONT. – Mackenzie Health, a technologically advanced hospital that has already achieved a HIMSS EMRAM Level 7 ranking, the top tier, has taken another step forward in its "smart-hospital" strategy with the launch of a digital platform for pathology.

"We're one of the earliest adopters of digital pathology in Canada," said Richard Tam, executive VP and chief administrative officer at Mackenzie Health. "This is going to lead to breakthroughs in timely diagnosis."

Pathologists typically examine tissue samples in cases of cancer and other serious diseases. The sooner the referring doctors receive a diagnosis of the tissue sample, the faster they can start treating their patients.

Currently, in most hospitals, pathology cases are examined using glass slides and microscopes, by pathologists inside the hospital. Often, they're sent to outside pathologists when a second opinion is needed or when an in-house pathologist with the required sub-speciality is not available.

Unfortunately, the process of sending slides by courier and receiving a diagnosis can take days or even weeks. It's time-consuming to package up the slides, send them off by taxi or courier, and wait for the pathologists to finish their readings and reports.

> **"This is going to lead to breakthroughs in timely diagnosis," said Richard Tam.**

However, the practice can be transformed by a digital platform – where the samples are digitized by a special scanner and sent to the experts via online networks. Once online, the process of sending samples to a specialist – either in-house or at another hospital – and receiving a diagnosis can be reduced to a few hours.

"The digital pathology network is an enabler of faster, more effective diagnosis and treatment," said Amir Soheili, program director, Clinical Support Services, at Mackenzie Health.

"Glass slides can also get damaged or lost," explained Soheili. And they can only be sent to one site at a time, where they are examined under a microscope by a single pathologist at a time.

But when the samples are digitized, they can be rapidly sent to several pathologists simultaneously, who could be anywhere in Ontario – or worldwide.

Not only is speed a factor, but so is the accuracy of the diagnosis. On this score, it helps

CONTINUED ON PAGE 2

Mackenzie Health becomes a Canadian leader in digital pathology

CONTINUED FROM PAGE 1

to have the help of "sub-specialists", who are sometimes located at various hospitals or facilities in the United States or Europe.

Sending glass slides to experts outside the hospital and obtaining reports can often take weeks, said Soheili. But again, using the digital network, the turnaround time can be reduced significantly.

In the near future, Mackenzie Health's seven pathologists will also benefit from the addition of artificial intelligence (AI) software, which will spot areas of interest in the samples for the pathologists to note. The AI software will act like intelligent assistants, helping with the diagnosis.

The hospital has been working on the project for two years in conjunction with its technology partner, Philips, which is supplying the technology solution. Mackenzie Health conducted a validation study over the last year, using about 1,000 pathology cases, to ensure the technology meets the standards of its doctors. Continuous validation and quality assurance will remain key elements within the Mackenzie Health Digital Pathology initiative, as the hospital considers itself to be in the start-up phase of the project.

Overall, Mackenzie Health conducts approximately 16,000 to 17,000 pathology cases each year. It expects that number to double when it opens a second hospital, the Cortellucci Vaughan Hospital, in 2021. (The organization recently received a $40 million donation from the Cortellucci family, which owns construction and development companies and has been active in philanthropy in the Vaughan area, north of Toronto.)

The two-hospital system will be greatly assisted, said Soheili, by the digital network, as attending physicians and pathologists will be able to share digitized images and reports from one site to the other.

When outside opinions are needed, Mackenzie Health now relies on pathologists at three or four outside hospitals. The hospital will be inviting these pathologists to join the digital network, to speed up access to patient pathology samples and the delivery of reports.

As well, Mackenzie Health will be open to pathologists across Canada and internationally who are willing to join the network.

"We're hoping to be the catalyst for digital pathology in Ontario," said Tam. Unlike radiology, which has been using computerized networks and tools for decades, digital pathology is just getting off the ground in Canada.

Dr. Andrew Evans

Richard Tam

Amir Soheili

Tam noted that Mackenzie Health is one of the first hospitals in Canada to have a full digital pathology platform consisting of scanners, workstations, software systems and a high-performance network.

Some hospitals have pieces of digital pathology systems, he said, but not all components.

At the core of the system are specialized pieces of equipment, like high-resolution and rapid-throughput digital scanners. Tam explained that each pathology slide can take up a gigabyte of storage space, and a study may consist of 20 to 100 slides or even more.

That requires high-capacity storage and fast-transfer of data on the network. But it's also helpful to have workflow tools for the pathologists, to help them manage the readings – something that's part of the Philips system. "It helps them share the workload between members of a whole team," said Tam.

Workflow software can intelligently split the reading of exams among pathologists, and if one specialist is busy, can reroute the work to another. This results in a much more efficient division of labour.

At Mackenzie Health, reports and radiology images are currently available to patients themselves through an online application called MyChart; the digital images of pathology cases will be available to patients through the same application in the near future. That will allow patients to more easily share information with other physicians and caregivers, as needed.

To help drive the digital pathology program forward, Mackenzie Health recently recruited Dr. Andrew Evans as the new chief of Pathology and director of Laboratory Medicine. Previously, Dr. Evans was division director, Telepathology, at the University Health Network in Toronto. He is a leader in the application of new technologies to the practice of pathology.

Tam noted that digital pathology also has benefits in lockdown situations – like the one we recently witnessed with COVID-19. For several months, hospitals significantly reduced the numbers of healthcare professionals working on-site, and reduced the flow of patients through their doors, to protect workers and patients from infection.

However, assisted by a high-performance digital network, pathologists will be easily able to work from home, receiving studies digitally and reporting online.

"When we have access to the data in this way, we remove one of the barriers to care," said Tam.

CANADIAN Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION TECHNOLOGY IN HEALTHCARE

Volume 25, Number 7 October 2020

Address all correspondence to Canadian Healthcare Technology, 1118 Centre Street, Suite 204, Thornhill ON L4J 7R9 Canada. Telephone: (905) 709-2330. Fax: (905) 709-2258. Internet: www.canhealth.com. E-mail: info2@canhealth.com. Canadian Healthcare Technology will publish eight issues in 2020. Feature schedule and advertising kits available upon request. Canadian Healthcare Technology is sent free of charge to physicians and managers in hospitals, clinics and nursing homes. All others: $67.80 per year ($60 + $7.80 HST). Registration number 899059430 RT.

Canada

Send all requests for permission to Jerry Zeidenberg, Publisher. **Publications Mail Agreement No. 40018238.** Return undeliverable Canadian addresses to Canadian Healthcare Technology, 1118 Centre Street, Suite 204, Thornhill ON L4J 7R9. E-mail: jerryz@canhealth.com. **ISSN 1486-7133**.

Publisher & Editor
Jerry Zeidenberg
jerryz@canhealth.com

Office Manager
Neil Zeidenberg
neilz@canhealth.com

Contributing Editors
Dr. Sunny Malhotra
Twitter: @drsunnymalhotra
Dianne Daniel
dianne.l.daniel@gmail.com
Dianne Craig
dcraigcreative@yahoo.ca
Dave Webb
dweebmedia.ca@gmail.com

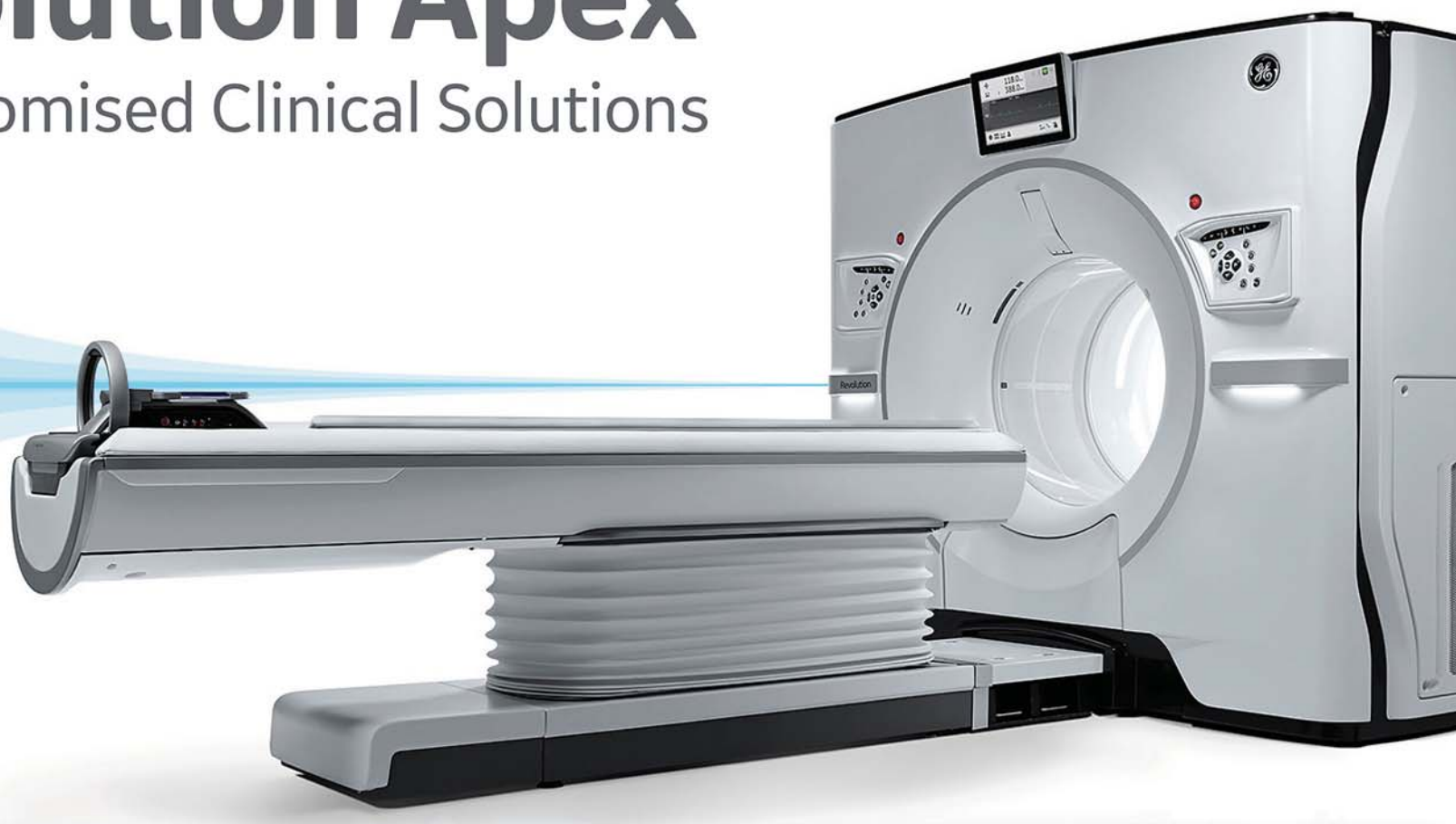
Art Director
Walter Caniparoli
art@canhealth.com

Art Assistant
Joanne Jubas
joanne@canhealth.com

BPA WORLDWIDE BUSINESS

Elevate with Revolution Apex™

Uncompromised Clinical Solutions



Your best images for **every patient**

1. **Uncompromised image quality.** Even for morbidly-obese patients.
2. **Ultrafast exam with ultra-low dose.** In less than one second. With full 50 cm FOV.
3. **1-beat cardiac.** At any heart rate. Even in atrial fibrillation. With low dose.
4. **High-resolution imaging.** Even with heavily calcified coronaries, plaque and stents.
5. **CT TAVI/TAVR Planning.** Single scan. Single injection. With low contrast volume.
6. **Dynamic whole-heart perfusion imaging.** Without shuttle. With low dose.
7. **Acute stroke CT workup.** In less than 5 minutes.
8. **Pediatric imaging.** Without sedation. Or Table Movement. With the lowest dose possible.
9. **Metal artifact reduction.** Both in single energy and dual energy.
10. **Spectral Imaging.** Even with larger patients. With speed.

Microscope to machine: rethinking the practice of pathology with AI

BY LISE DIEBEL

HAMILTON, ONT. – Dr. Clinton Campbell envisions a future where pathologists work as information specialists in sophisticated computer labs with the world's most current, relevant data at their fingertips. Instead of diagnosing disease one slide at a time under a microscope, there would be thousands of images to compare online.

Dr. Campbell is working to make that vision possible by harnessing a type of artificial intelligence (AI) known as machine learning.

The first steps toward this high-tech future are taking place at Hamilton Health Sciences (HHS) right now, thanks to an innovative pilot project exploring digital pathology and AI. It's among the first projects of its kind in Canada, and could help modernize the way pathology is conducted around the world.

"Pathologists currently use an old-fashioned light microscope to view sections of human tissue, which is a 300-year-old technology," said Campbell, one of about 100 pathologists in Canada who specializes exclusively in blood disorders, like leukemia. Campbell is leading an HHS study into digital pathology and AI. He is supported by Drs. Catherine Ross and Monalisa Sur for this pilot.

Pathologists study tissue samples of disease taken from patients during surgery, or in the case of blood, during a procedure known as a bone marrow biopsy.

Samples are placed on glass slides for examination under a microscope. Pathologists then look at minute features of cells and tissue and extract information to better understand the disease. This, in turn, may lead to a diagnosis and the best treatment options for patients.

Pathologist Dr. Clinton Campbell, left, works on the AI project with graduate student Youqing Mu.

"The system we have currently works well," said Dr. Campbell. "But we can't share images of human tissues in real-time with colleagues or do `virtual peer review' where multiple pathologists can examine slides together at the same time."

Currently, when a pathologist at another hospital wants Dr. Campbell to view a set of slides and offer insights, the slides are shipped to him in thick cardboard folders.

"This is an inefficient process that leads to delays in diagnosis. Imagine how much better it would be if we could share these slides digitally in real-time," said Dr. Campbell. "It would allow for wider, faster consultation. And if you add AI into the mix, you've also got access to a vast amount of knowledge that's sorted through machine learning to prioritize the very best information to help with your case."

Machine learning, in the most basic sense, is a type of AI that can automatically learn patterns from data, like pathology images, and then use this knowledge to make useful predictions about the world. This means faster, better reports because machine learning will help extract the most important information, and then compare this to tens, hundreds or even thousands of other previously diagnosed samples instantly.

"It's kind of like having Google for pathology, with a team of virtual pathologists on standby in the cloud 24/7," he says. "This could transform the way diagnostic medicine is done."

HHS is conducting a one-year pilot project on digital pathology in partnership with Huron Digital Pathology in St. Jacobs, Ont.

Huron's AI-based image search platform connects pathologists to the expertise of their colleagues worldwide, increasing the speed and effectiveness of patient care.

HHS is using a scanner provided by Huron to collect and catalogue digital slide images. The project started in May and is based at HHS Juravinski Hospital and Cancer Centre. The goal is to collect 3,000 digital images from blood and bone marrow pathology slides.

The partnership between HHS and Huron was made possible through the Ontario Bioscience Innovation Organization (OBIO), a not-for-profit organization dedicated to advancing health technology innovation and commercialization. The OBIO recently announced the launch of the first eight Early Adopter Health Network (EAHN) innovation projects, including the Huron-HHS partnership.

So why has it taken so long for pathology to dip its toes into the digital pool? A major hurdle has been image file size and processing. Hamid Tizhoosh heads the Laboratory for Knowledge Inference in Medical Image Analysis (KIMIA Lab) at the University of Waterloo. He helped Huron develop its technology and has been working with Huron and Dr. Campbell to devise a system that loads images faster and more efficiently.

They are doing this by collecting only the small sections of pathology specimen images that relate directly to the disease, rather than trying to load the entire image. Images are then processed with AI tools to make a powerful image search engine.

"Huron and the KIMIA Lab piloted this groundbreaking technology, and we're now expanding this into hematology with the hope of improving it and applying it to blood disorders like leukemia, lymphoma and myeloma," said Dr. Campbell.

Lise Diebel is a Public Relations Specialist at Hamilton Health Sciences.

AI-powered app quickly finds latest information about COVID-19

MISSISSAUGA, ONT. – As the COVID-19 pandemic continues to sicken and kill people around the world, questions continue to arise about the characteristics of the virus. For example, how do we avoid infection, and what are the best practices for caring for those who have contracted the disease. A new app, COVID AI KnowledgeEnable™, uses artificial intelligence to rapidly find the latest peer-reviewed articles that answer the questions of physicians, researchers and members of the public.

To be sure, there is much to learn about the novel coronavirus. "There are hundreds of new scientific findings in every medical discipline, published every day," said Ian Maynard, CEO and co-founder of Real Time Medical Inc., the developer of the app. "During this pandemic, you can multiply that by a factor of 10."

Real Time Medical's app makes triaging this information possible using AI and the collective insight of experienced medical professionals around the world.

COVID AIKnowledgeEnable is a clinical decision support app and information location tool that allows users to engage in research and education by helping them to locate trustworthy medical articles and other resources where such content is already available on the internet. Significantly, the app includes ratings of articles and commentary from healthcare professionals to assist users in determining which sources will be most helpful to them.

With the support of the National Research Council of Canada's Industrial Research Assistance Program, Real Time Medical has been working on the underlying technology of AIKnowledgeEnable for almost two years. When COVID came along, the company decided to apply that technology to the information clutter created by COVID.

"The app is specifically designed for both healthcare professionals and the public to help them make better informed decisions for their patients, their families and themselves," said Dr. David Koff, chairman and co-founder of Real Time Medical. "Only trusted, peer reviewed data sources are used."

Dr. Koff explained that users benefit from seeing information directly from the original source. They also gain insights from comments or recommendations that doctors and researchers may have about a particular finding."

"With a resurgence of COVID-19 infections in multiple jurisdictions in North America and around the world, and the advent of a new school year, people need a way to zero-in on the most valid scientific data and advice required to keep their families and patients safe – and to cut confidently through the clutter of misinformation," said Dr. Koff.

Clinicians and the public will also be able to use an updated version of COVID AIKnowledgeEnable to research the latest data on any medical symptom or ailment they choose – not just COVID-19.

RTM's COVID AIKnowledgeEnable combines AI-enabled search of multiple, trusted, peer-reviewed medical data sources with the collective intelligence of direct physician input to deliver the most relevant and current findings.

Overlaid with the latest federal health guidelines, COVID AIKnowledgeEnable is an effective weapon in the global fight against COVID-19, arming healthcare professionals and the public alike with the information they need to make the right decisions from trusted medical data sources such as the Centers for Disease Control and Prevention, the New England Journal of Medicine, the Lancet, and others.

"Amid the race for a viable vaccine, it

CONTINUED ON PAGE 20

Transforming healthcare
delivery across the
circle of care.

We are leveraging virtual care technology to keep Canadians and their care teams connected.

Discover our virtual care solutions.
telushealth.com**/virtualcare**

TELUS® Health

St. Joseph's Healthcare Hamilton launches virtual emergency visits

BY ELAINE MITROPOULOS

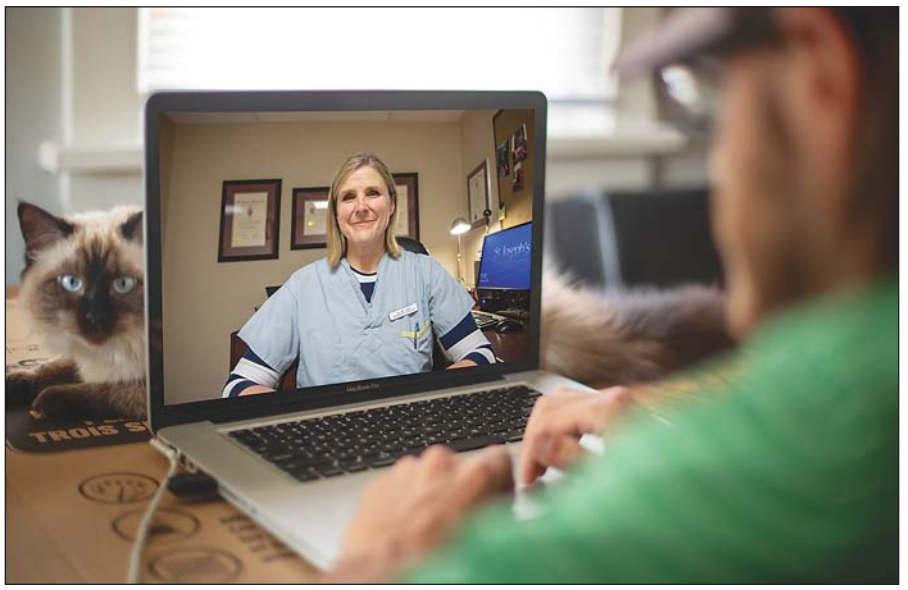
HAMILTON, ONT. – St. Joseph's Healthcare Hamilton has introduced a new method of patient care to better meet the needs of the community during the COVID-19 pandemic and beyond: virtual care for emergency department services. All it takes is a smartphone, tablet or computer to save a trip to the hospital.

"Emergency departments and urgent care centres in Hamilton are still open for in-person visits, and are safe for those seeking care," says Dr. Gregory Rutledge, chief of Emergency Medicine at St. Joe's. "Virtual appointments, however, are an ideal option for those who are hesitant about coming to hospital, and who are experiencing urgent but non-life-threatening health concerns, are unable to obtain timely access to a family physician, or do not have a family physician."

By filling out a virtual appointment request form on the hospital's website, eligible patients can book same-day virtual visits on a first-come, first-served basis. At the appointed time, patients connect with an emergency department physician through a secure video portal integrated with Dovetale – St. Joe's digital health information solution.

"Virtual visits are not intended for high-acuity patients who are experiencing real emergencies, such as a heart attack or stroke," Dr. Rutledge adds. "Patients in severe medical distress should always call 911, and should not drive themselves to the hospital."

Likewise, if symptoms worsen while waiting for a virtual appointment, Dr. Rutledge advises visiting the emergency department in person.



Virtual appointments are ideal for those who are hesitant about coming to the hospital for urgent care.

What to expect during a virtual appointment: Through the video visits, physicians provide extensive and safe patient assessments and clinical recommendations for further treatment, including referrals to other care providers. Physicians can also prescribe new medication but cannot provide regular refills of medication already prescribed.

Patients 18 years of age or older, with a valid Ontario health card, can fill out the online registration form to be scheduled for a virtual appointment. Patients who are successful in securing a same-day appointment can expect to wait an average of one hour before hearing back.

Patients can use the service if they have access to the following: Computer or mobile device with video and microphone capabilities; the Zoom application; Internet access; e-mail (to access appointment link and reminders); a quiet, secure space to engage in a virtual visit.

While virtual care sessions are not recorded, they are documented in a patient's electronic health record. Moreover, notes from the virtual visit are shared with a patient's family physician through secure fax within 24 hours from a visit.

A timely solution to providing care: At the onset of the COVID-19 pandemic, Dr. Rutledge says the hospital's emergency department saw a significant decline in visits. Physicians worried people with urgent issues needing a medical assessment were choosing not to come to the hospital out of fear of contracting the coronavirus.

"As St. Joe's gradually reintroduces services and volumes at the hospital increase, having virtual options, including a virtual emergency department, helps to limit traffic in the hospital, while providing the right care to patients from the comfort of their own home or space," he says.

Through the service, Dr. Rutledge's team has provided virtual assessments to patients with a range of health concerns, including head injuries, abdominal pain, back pain, and rashes.

Since launching in July, the service has seen a steady increase of patients, with a dedicated virtual emergency department physician available to accommodate as many as 45 patients a day. Dr. Rutledge expects a greater volume of patients in the fall, when it is expected the flu season will coincide with a second wave of the pandemic.

"Now that we have the technology and program in place, we see the service expanding as people access virtual care to be appropriately directed to an assessment centre for testing, the hospital, or to stay at home and quarantine," he adds

The future of virtual emergency visits: Dr. Rutledge says future plans to extend the virtual service include issuing lab orders, as well as follow-up appointments to expedite and ensure continuity of care.

"The ability to schedule follow-up appointments to review how patients on home care, intravenous therapy, or antibiotics are feeling after discharge will offer an extra layer of assessment," he says.

He also sees a place for virtual emergency services in treating patients in remote areas, as well as providing peer-to-peer support for health-care providers in communities that could benefit from additional resources.

"Throughout the pandemic, St. Joe's has proven to be an innovator in virtual care," Dr. Rutledge says. "With good evidence to support patients have been happy with their virtual appointments during COVID-19, we will continue to find new ways to deliver care to the community."

To learn more about St. Joe's virtual emergency visits program, see stjoes.ca/emergencyvirtualvisits.

Elaine Mitropoulos is a public affairs specialist at St. Joseph's Healthcare, Hamilton

Waiting rooms and COVID: New solution helps with physical distancing

BY ANNE SCOTT

PRINCE GEORGE, B.C. – In May 2020, with the COVID pandemic escalating, Northern Health searched for options to enable better physical distancing in common patient waiting areas.

A Northern Health interdisciplinary team representing Laboratory, Medical Imaging, and Information Management and Information Technology (IMIT) investigated solutions. The team was led by Bjorn Butow, director, Clinical Information Systems, and Lisette Vienneau, regional director, Diagnostic Services.

After reviewing vendor offerings, the team decided to implement the Net Check In solution by Innovative Computer Software, a company based in Minneapolis, Minnesota. Net Check In's system is used by more than 12 million people around the world, in sectors that include retail and hospitality, education, automotive and laboratories. It bills itself as the top "queue management solution" available.

In Northern Health, the service has been branded as "NH Check In" and decreases the number of patients in the region's hospital waiting rooms. Instead, it lets them safely wait in their cars, homes, or offices until just before their appointments.

"Many patients are so eager to use this service, especially during the pandemic" says Butow. "They see real-time wait-time updates so they can better juggle their life, work and family without being tied up in our waiting rooms with other sick patients."

Net Check In is hosted in Canada (using AWS) and is a simple, cost-effective solution that met Northern Health's clinical and IT requirements. It was quick to implement and is easy to use for both patients and healthcare departments.

Patients can use the service through an app (iOS or Android), or through the Northern Health website.

They receive app notifications and can sign up for text-based notifications.

Interestingly, Net Check In is used by Canada's two largest private labs – by LifeLabs at 380 locations, and by Dynacare at 200 locations.

"NH Check In not only helps to reduce the COVID-19 risks to our patients, especially the most vulnerable, but also

reduces the risk to our front-line staff and healthcare providers," said Vienneau.

It's also a great tool for rural and northern patients, many of whom have to travel long distances with family to get to their medical appointments.

"We have many patients who don't live near a Northern Health facility," says Sandi Watts, the project clinical lead. "It's a very patient-centred service that offers a convenient way to check in for services ahead of time, so they can better plan their travel."

Booked appointments can also be factored into the wait times.

"Patient feedback so far has been really positive and enthusiastic," says Kent Foreman, the project's technical lead. "It's reduced the number of patient phone inquiries and provides better service reporting to Northern Health operations."

The product launched at the end of July for laboratory services in three pilot locations in Northern BC: Prince Rupert, Terrace, and Dawson Creek.

Over the coming weeks and months, it will expand to support other locations – approximately 20 communities across northern BC – and other types of services and clinics.

Anne Scott is the Regional Manager of Corporate and Program Communications, Northern Health.

PHILIPS

Pandemic Reality

A path to building **stronger healthcare systems**

Now more than ever, we need to deliver care differently, and radical innovation can help us. Philips' newly released **four-part series** shows what's working and what's possible to build effective healthcare systems for today's needs.

To discover the series, please **visit www.philips.ca**.

innovation you

iTelemed expands scope, adding devices and reaching new patients

BY JERRY ZEIDENBERG

LONDON, ONT. – Most virtual visits today involve patients talking to doctors over the phone or, in more advanced scenarios, using Zoom or Teams for video visits. But a group of eight physicians at iTelemed, in London, Ont., have extended the practice of virtual medicine by deploying instruments at the point-of-care.

They're training visiting nurses, personal support workers and other care-givers, located at the point-of-care, to use a digital stethoscope, otoscope and dermascope, so that a remote doctor can conduct a more comprehensive exam.

"In this way, we're able to make virtual house calls," said Dr. Keith Thompson, a family doctor and chief medical officer at iTelemed, part of the Canada Telemedicine Group. "It's more than just the regular video encounter."

The non-profit telehealth company has been working on putting together the equipment that's needed to conduct a reliable remote exam for several years now.

Dr. Thompson said iTelemed has tested several peripherals, and now has a kit that's effective. It can be taken on rounds by a nurse, or shipped to a site when needed, where a trained healthcare worker can operate the peripherals after connecting a laptop computer to reach the doctor.

A key part of the system is the Agnes software platform, which runs on the doctor's desktop computer and connects to the remote computer and the peripherals. The Agnes software has been licensed from AMD Global Telemedicine, a company that has been in the telehealth business for decades. It's located in the Boston area.

In another innovation, iTelemed has started conducting virtual visits in congregate living sites. In particular, the physicians at iTelemed are working with Participation House, which runs more than 60 small facilities for continuing, complex care patients in the London area.

Each facility has three or four individuals with serious medical issues. Some patients may be on mechanical ventilators and may also have physical and developmental disabilities such as COPD, heart failure, asthma, epilepsy, schizophrenia, and other medical issues.

"They are medically the most challenging part of the population to treat," said Dr. Thompson.

He gave an example of a recent incident in which a resident at a Participation House facility was having trouble breathing. To further test the concept of a remote visit with the assistance of medical peripherals, Dr. Emad Heinen conducted a virtual check-up on the patient.

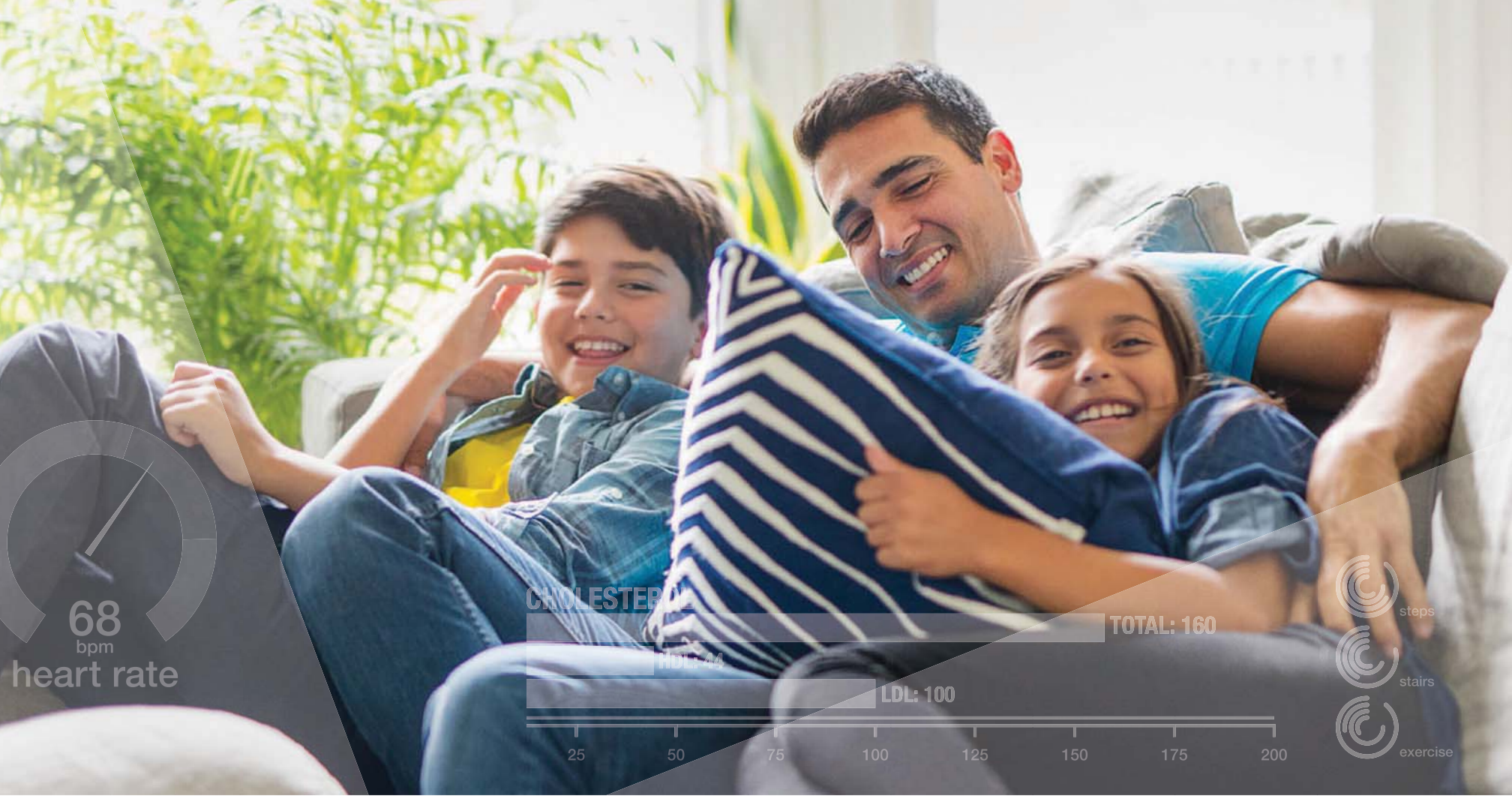
With the help of an on-site care-giver, and the remote stethoscope, Dr. Heinen determined that the patient was suffering from pneumonia. "He could hear the crackling in the lung," said Dr. Thompson.

He could also prescribe antibiotics to get the patient started on the road to recovery. For its part, iTelemed is working with a pharmacy that can accept digital scripts and deliver prescriptions right to the door of the patient.

In this instance, Dr. Heinen, Dr. Thompson and on-site staff had prevented a trip by the patient to the local ER – and had obtained a diagnosis and treatment plan quickly. "The staff were smiling," he said. "They knew that without the virtual house-call, a trip to the hospital would have been needed."

Earlier this year, iTelemed announced a partnership with Fanshawe College in London. The collaboration will see Fanshawe, a community college, train local nurses and personal support workers in the use of the virtual care peripherals.

They'll get training in how to set up and position the digital stethoscope, otoscope and dermascope. In this way, more care-givers will be able to assist iTelemed's doctors at the point of care. Dr. Thompson said that iTelemed is also looking into the possibility of examining patients at nursing homes using virtual technologies.



Embracing proactive health for better outcomes

Promoting prolonged wellbeing is something that benefits us all –citizens, communities, and health organizations alike.

Wellbeing relies on a holistic view of individuals and wider populations, and Cerner can help you achieve this. Our personalized, comprehensive suite of products and services allows you to join the dots of people's health to form a complete circle of their lives and those of their community.

With Cerner's *HealtheIntent*®, you get to **know** your population, **engage** its members and **manage** what happens to ensure the delivery of better outcomes.

cerner.ca @CernerCanada

Health care is too important to stay the same.™

Cerner®

Tech allows community care nurses to make their rounds, even at a distance

BY DAVE WEBB

OSHAWA, ONT. – The "virtual ward" project at the Central East Local Health Integration Network (LHIN) was pushed ahead of schedule by an unlikely force: the COVID-19 pandemic.

"It's been an organizational goal for quite some time," said Dr. Ilan Lenga, a nephrologist and chief information officer for Lakeridge Health, part of the Central East network. But COVID-19 was "a major impetus" to accelerate things.

The "virtual ward" is exactly that – nurses can monitor the recovery of whole groups of remote patients as if they were doing rounds. The difference is, the patients aren't in the hospital.

Built on the Vivify remote-care platform, an app pushes questions to the patient's smartphone – the same questions a nurse might ask on his or her rounds. Community care nurses monitor the results, communicate with patients to address issues, and consult with doctors to determine whether the patient should return to the hospital.

There are several reasons to clear the brick-and-mortar wards more quickly, said Dr. John Dickie, chief of surgery and section chief of thoracic surgery at Lakeridge. The longer patients stay in the hospital, the more likely they are to be exposed to pathogens. And a likely second wave of COVID-19 infections is looming ominously on the horizon.

Meanwhile, hospitals are trying to catch up with a five-month backlog of surgical patients, whose operations were delayed due to the pandemic. There are additional pressures to get them in and out of hospital quickly, but with the best possible outcomes.

"Hospitals are looking for capacity," said Cathy Slevin, senior manager of clinical care and home and community care programs for the LHIN.

Once they are discharged, patients are faced with a "white space", those nerve-rattling weeks before the follow-up appointment with a doctor. Patients may encounter a serious problem while at home, and might need to see a medical professional earlier. Or they may get the jitters and return to the hospital unnecessarily.

However, remote nurses can check on them "virtually", by using the Vivify platform. In this way, they can advise the patient on what to do for serious problems - such as calling an ambulance or seeing the doctor right away. If the problem is less urgent, the nurse can advise the patient on how to handle things at home.

"Every day, (the virtual ward) is like a nurse doing a bedside assessment," Slevin said.

And that assessment can be done while nurses are performing their other duties. Nurses have a "traffic light" dashboard to determine what needs follow-up by phone or video, and an escalation path for more serious cases. Patients can be referred directly to a doctor or team rather than waiting in the ER.

The first virtual ward cohort, launched August 6, was composed of recovering COVID-19 patients. Congestive heart failure (CHF) and chronic obstructive pulmonary disease (COPD) were scheduled next, followed by patients recovering from thoracic surgery.

While the program is only taking thoracic surgery patients at first, Lakeridge intends to extend it to all post-operative patients, said Dr. Dickie. Orthopedic surgeons are "very motivated" to be included in the program, said Dr. Lenga.

Dr. Lenga said surgeons are "onboarding" community care nurses, training them in the specific issues and escalation paths related to their particular specialty.

In addition to bedside assessments, community care nurses are good at navigating available resources for patients in the community, said Slevin. For example, if a patient is homebound and out of groceries, they can connect the patient with a community organization that can help.

Leveraging existing technology made the program very low-budget and quick to implement, Slevin said. Patients don't need

CONTINUED ON PAGE 19

Decentralized testing ensures therapeutic continuity with anticoagulated patients

Self-monitoring empowers patients and improves treatment outcomes in times of COVID-19.

Removing barriers for Canadian patients so that they can better access diagnostic tests has recently taken on heightened importance, especially in the COVID-19 pandemic. Proper diagnosis is the only way to ensure that the right choice of treatment regimen is made in a timely manner, but how can we do this more effectively?

Point-of-care testing is emerging as a reliable method to improve health outcomes by bringing diagnostic testing closer to the patient across the clinical spectrum, significantly accelerating diagnosis while increasing cost-effectiveness. The availability of quick and accurate medical information through point-of-care testing has never been more crucial.

With COVID-19 putting extreme pressures on our healthcare system, there has been a marked increase in point-of-care diagnostic solutions combined with telehealth. The increase can be attributed to attempts to minimize potential virus exposure by taking patients out of the institutional setting, thereby safeguarding their health and that of healthcare providers. When doing so, however, an important balance needs to be struck to maintain therapeutic continuity for patients, especially for those with conditions that require ongoing medical counselling to manage health risks and adjustments to dosages.

Life changer for anticoagulated patients

Patients on anticoagulation treatment are a case in point. They account for 1% of the Canadian population (i.e. more than 350,000 Canadians), mostly 55 and over, which is a group already at increased COVID-19 risk. Despite the introduction of new oral anticoagulants, warfarin continues to be the standard of care in the prevention and treatment of thromboembolism. With some 100,000 Canadians currently being treated with warfarin and requiring regular diagnostic testing to evaluate proper dosage, they are well-served with a small portable reading device to self-monitor coagulation from the comfort of their own home, such as the CoaguChek® coagulometer.

Bob's story

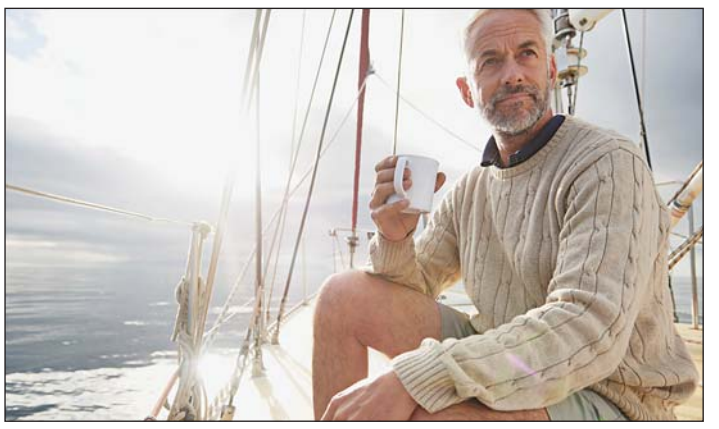
Bob Ramsay is one such patient. After an aortic valve replacement, Bob was placed on life-long anticoagulant therapy, which required him to undergo INR (International Normalized Ratio) testing at a Toronto-based clinic twice a week. It was a burden that not only heightened his anxiety, but also hampered his passion to travel. When he heard about self-testing, he was immediately interested. It finally gave him the convenience and peace of mind he wanted. For patients like Bob, the advantages are clear. CoaguChek® enables them to take charge of monitoring their blood coagulation themselves and to participate actively in their treatment without having to visit a hospital or clinic. All is needed is to take a drop of blood from a fingertip – a virtually painless step – and insert the test strip into the device for analysis. In just one minute, the system reveals the coagulation result with an accuracy very comparable to that of a laboratory test.

This is in direct contrast to the impact of testing in a clinical setting, which contributes to absenteeism at work, recurring parking costs, challenges for people with reduced mobility, as well as many other difficulties that threaten treatment adherence. These frequent visits also monopolize important health system resources, requiring the work of nurses, laboratory technicians and physicians for each analysis, in addition to increasing the risk of exposure of more vulnerable patients to contagious viruses in the hospital environment.

Decreasing the burden on the healthcare system

CoaguChek® offers reliable support for follow-ups by clinicians, providing patients with peace of mind while decreasing the burden on clinics and hospitals. Manufactured and distributed in Canada by Roche Diagnostics for the past 15 years, CoaguChek® is an easy-to-use and effective fingerstick technology that helps patients measure their own IRN from a single drop of blood.

Each test takes no more than one minute, providing nearly immediate results and adjustment in medication with minimal patient discomfort, all in the comfort of their home. They are also able to interact remotely on a regular basis with their physician – or even their pharmacist – to share results and discuss dose-adjustment guidelines.



CoaguChek® enables patients to participate actively in their treatment without having to visit a hospital or clinic.

The cost of the coagulometer, as well as that of test strips, is reimbursed by most private insurers in Quebec, the only province where such coverage is currently offered. For patients covered by the Quebec's Public Prescription Drug Insurance Plan, the Régie de l'assurance maladie du Québec (RAMQ) covers the costs of test strips. Although there is currently no provincial coverage for CoaguChek® test strips outside Quebec, clinicians and healthcare administrators have an important role to play in sharing the benefits of the CoaguChek® system and INR point-of-care (meter) testing with provincial government representatives and other healthcare professionals. Increased awareness among healthcare decision makers would go a long way in making INR point-of-care testing meters more accessible across the health system.

INR testing anywhere and anytime with immediate results.

Better outcomes and lower risk of complications

Dr. Samer Makhaly, a resident physician and Hematology research co investigator at McGill University, provides additional insight on the benefits of CoaguChek®.

"I have worked closely with many patients using the CoaguChek® device. With proper training, patients find the device user-friendly, convenient and time saving," he explains. "With the help of 'point-of-care' technology, patients feel empowered and are actively involved in their own care. This has reflected positively on multiple aspects, including patients' compliance, as well as the time in which they are in their target INR range."

Numerous studies have shown that patients who frequently measure their INR themselves have better treatment outcomes and a lower risk of complications.[1,2] In addition, the combination of warfarin and self-monitoring is a cost-effective solution for stroke prevention and offers equal or better efficacy than the new class of oral anticoagulants.

Contributing to better results at the point-of-care

Thanks to innovative tools like CoaguChek®, Roche Diagnostics is the world leader in in vitro diagnostics, supplying a wide range of rapid, reliable instruments and tests for disease screening and diagnosis in laboratories, at the point-of-care, and for patient self-management. It delivers a comprehensive range of rapid, cost-effective and user-friendly diagnostic systems designed to measure a variety of clinically relevant parameters.

The CoaguChek® system is the leading professional and patient PT/INR point-of-care testing meter in Canada providing accurate PT/INR values from a single drop of blood within one minute, enabling immediate results and adjustment of medication with minimal discomfort to the patient. It shows highly comparable results with the gold standard reference method of the World Health Organization (WHO) and an excellent correlation to laboratory analyzers. The use of point-of-care testing (POCT) coagulation monitoring devices is recommended by Canadian health technology assessment agencies (HTAs) for professional use and for patient INR self-monitoring, when appropriate.

Tools like these show that a broader adoption in the healthcare system of POC INR monitoring will provide equitable access for all eligible patients to high quality anticoagulation management while addressing the burden of increased costs associated with anticoagulation therapy.

For more information: coaguchek.ca and rochecanada.com

1. Garcia-Alamino JM, "Self monitoring and self management of OAT," *Cochrane Review 2010.*
2. CADTH, "Guidance on the usage of POC," *CADTH Report 2014, Volume 3, Issue 1C*

Virtual visits contribute to patient safety, giving patients more options

BY DR. RASHAAD BHYAT

A few months ago, I wrote an article for this magazine in which I talked about the dramatic rise in the adoption and implementation of basic virtual care as a result of the COVID-19 pandemic, and the challenges we will have to overcome to build on this success. With Canadian Patient Safety Week coming up October 26-30, I want to talk about how virtual care is contributing to patient safety.

Before the pandemic began, about 10 to 20 percent of primary care visits in Canada were conducted virtually – that is, by video, email, text messaging, secure messaging or phone. Within weeks of the onset of the pandemic, that had risen to about 60 percent, according to statistics tracked by Canada Health Infoway (Infoway).

I was among those clinicians who adapted quickly. In just a few weeks, my family practice group went from seeing the majority of our patients in-person, to conducting most of our consultations virtually – largely by phone, with some video visits.

Patient safety was the main driver for this pivot to virtual care. Everyone was on high alert to comply with stay-at-home directives, observe physical distancing, and keep people out of crowded clinics and waiting rooms to reduce their risk of contracting the virus. There was also a concern that the shortage of personal protective equipment was putting clinicians at risk.

There are a number of other ways that virtual care is contributing to patient safety. Let me share an anecdote about one of my patients who had just come out of a very serious neurosurgical procedure around the time that COVID-19 hit.

The patient was recovering at home and experiencing what turned out to be a significant post-operative complication. I was able to schedule a video visit with this patient to see what was going on.

Dr. Rashaad Bhyat

As a result of seeing the patient, and not just hearing the patient describe the problem, I was able to make a more accurate diagnosis that helped the patient get the level of care that was needed at that time. I might not have made the same diagnosis if we had had a phone visit or no contact at all.

Some patients might not realize that they can have a caregiver, family member or friend with them when they have a virtual visit. Just as with an in-person visit, having another person there to ask questions or hear the conversation, contributes to patient safety. The Canadian Patient Safety Institute is emphasizing this aspect of virtual care during its Conquer Silence campaign for Canadian Patient Safety Week this year, and I think it's very important.

As Canadians continue to cope with the pandemic, mental health is a concern that can also be a safety issue, especially if people in crisis are contemplating self-harm. Infoway is a major funding partner of the virtual care service Crisis Text Line powered by Kids Help Phone, which offers bilingual 24/7 support to young Canadians via texting, their preferred method of communicating. Young people might not want to go to a doctor or an emergency room or even make a phone call for help, so the texting service gives them a modern option they're comfortable with.

Last year alone, this service had almost 134,000 texting conversations that provided support or interventions that saved approximately five young lives every day. Infoway recently partnered with a complementary service in Quebec called Tel-jeunes. It offers virtual mental health services to young people via phone, text, email and chat, and demand has increased by at least 30 percent since the pandemic began.

Dr. Rashaad Bhyat is clinician leader, ACCESS Health at Canada Health Infoway.

Jewish General tests Microsoft HoloLens and mixed reality for COVID control

The researchers foresee additional uses of the technology in long-term care facilities and rehab centres.

MONTREAL – To protect healthcare workers against the risk of exposure to COVID-19 from infected patients, the Jewish General Hospital (JGH) is one of the first medical institutions in North America to experiment in real-time with mixed reality headsets to minimize direct contact between staff and patients.

By using Microsoft HoloLens, an untethered mixed-reality device with apps and solutions that enhance collaboration, practitioners are better equipped to provide the best personalized care at a time when physical proximity presents an imminent danger.

"With a single person in the hospital room, we can secure the information we need about a patient's condition while minimizing the risk of the spread of infection," explained Dr. Lawrence Rudski, Chief of Cardiology and Director of the Azrieli Heart Centre at the JGH, who is spearheading this trial. "With HoloLens and the Dynamics 365 Remote Assist app, we are able to limit contact and enhance consultation at the same time."

Dr. Rudski explained that a physician or other healthcare professional can safely enter a patient's room after donning PPE and a HoloLens. The device captures a view of the patient and the room, while colleagues view the images and consult from a safe locale elsewhere in the hospital. If necessary, additional resources and expertise can be brought to the bedside.

HoloLens uses cloud and artificial intelligence (AI) services, including Dynamics 365 Remote Assist and Microsoft Teams, to send a highly secure, live video-feed to a computer screen in a nearby room. This allows healthcare teams to see everything the doctor treating COVID-19 patients can see, while they remain at a safe distance.

Those watching can interact with the individual wearing the HoloLens by uploading charts and X-rays into the field of view and even draw on or point out at eye-level a place on the patient's body where a procedure is to be performed or a treatment administered. It also allows for dictation of voice-to-text and hand gestures to operate its internal computing capabilities so forms and charts may be completed in real time.

HoloLens provides a comfortable and immersive mixed-reality experience that is preferable to smart phones or other devices because of its reliability, security, and mixed media applications. It is also hands-free, thus allowing the person who is with the patient to perform a variety of tasks while remaining in constant contact with those outside.

Dr. Rudski said the hospital's experience with HoloLens amid the first wave of COVID-19 proved the tremendous capability of the technology and will help the team be better prepared for a possible second wave.

PHOTO: COURTESY OF AUGER GROUPE CONSEIL, MONTREAL

"We are now looking into other areas to deploy this powerful technology and we are focusing on addressing some challenges we identified in the first go-around," he said. "These include lacking specialists in our affiliated nursing home and rehab hospital settings, pairing up doctors in these institutions to make care more efficient, as well as having enough trained nurses in the ICU, should the number of patients needing ventilators proliferate.

"We also expect that the experience we gain during these projects will refine how we will use the HoloLens in other non-COVID settings in the hospital, in other sites, and even out to home care in the community. As the HoloLens evolves, we will work with Auger Groupe to incorporate these advancements and we will leverage them into our patient care plans," said Dr. Rudski.

"Having the privilege of helping the medical team at the Jewish General Hospital to fight COVID-19 is an incredible opportunity for my team of mixed reality experts," said Marcel Lafontaine, P.Eng, the CEO of Auger Groupe Conseil. Montreal-based Auger Groupe Conseil specializes in industrial process engineering and has expertise in improving the performance of organizations. "By working to integrate innovative Microsoft tools to minimize the risk of contamination and optimize the treatment of patients, we are, together, advancing science."

Kevin Peesker, President of Microsoft Canada, said, "I am pleased to see the incredible work the Jewish General Hospital and Auger Groupe Conseil is doing with Microsoft HoloLens and Dynamics 365 Remote Assist to help keep patients and healthcare workers safe." Peesker added, "I'm heartened by the innovative solutions that Canadian researchers and healthcare providers are developing – at record speed – to help in addressing the pandemic. These innovations, made possible by the power of the cloud, will positively impact the delivery of patient care far beyond COVID-19."

Technology helps JGH navigate COVID crisis

"As the first hospital in Quebec designated to treat coronavirus patients, we were compelled to adapt our operations to the reality of a large number of highly infectious individuals needing our care," said Dr. Lawrence Rudski, Chief of Cardiology at the Jewish General Hospital and Chief Medical Information Officer for CIUSSS – West Central Montreal, the local health region.

"We rapidly identified those technologies that could help us navigate this crisis, with an eye on how they would improve the care we provide our patients going forward," he added. "We formed a team of progressive leaders in the departments of Nursing, Critical Care, Surgery and Medicine to develop protocols for use and to work with HoloLens. We are confident that HoloLens will be a valuable tool for facilitating remote consultations between local physicians, nurses and specialists anywhere within our network, but also anywhere in the world for all manner of treatment scenarios.

"In the short term," he continued, "it enhances the safety and security of our healthcare professionals, while reducing our need for personal protective equipment."

The JGH has run a series of successful HoloLens simulations involving COVID-19, palliative care and intensive care unit scenarios. The device has also been used to provide wound care to a patient, guided by a nurse specialized in the area. "The next step," adds Dr. Rudski, "is to have staff ready to use this technology across our CIUSSS in time for the anticipated second wave of the pandemic. Subsequently, our plan is for our clinicians to use HoloLens headsets to consult with colleagues within our CIUSSS and for us to provide our own expert consultation to other sites throughout Quebec and beyond.

Bringing new virtual pharmacy technologies into the hospital sector

This past spring, after most of the world came to a standstill due to the pandemic, many workplaces began transitioning their employees to remote locations. For some, this meant setting up new ways of connecting with technology, considering shared meeting platforms that would be safe and secure, and ensuring appropriate infrastructure was in place to support home offices.

As businesses adapted to our new normal, at North West Telepharmacy Solutions it was business as usual for over 100 employees already working from integrated remote offices across Canada.

During this pandemic, multiple projects continued and flourished. "A high priority project has been meeting the needs of our current clients to integrate CPOE and scanning services in one solution, PowerGridRx by Pipeline Rx. We did not miss a beat since both our companies have been positioned to work securely anytime from anywhere," said Kevin McDonald, director, North West Telepharmacy.

PowerGridRx securely enables both CPOE and scanning of written paper orders into a cloud-based solution for verification, review and follow up by pharmacists and pharmacy technicians. Features such as handover reports, interventions, and statistical capture make this a solid solution. Furthermore, the solution makes telepharmacy much more efficient, which will eventually decrease the cost of doing business and make telepharmacy an even more attractive alternative for hospital pharmacy support in off-hours.

Innovation and addressing market gaps has always been a priority for North West Telepharmacy. Projects such as Canadian access to Penguin Innovations "Virtual

Cleanroom" and other pharmacy learning opportunities highlight this. Adapting to the needs of clients was a natural step and evolution of the projects.

McDonald explained, "We now have two Canadian Council on Continuing Education in Pharmacy (CCCEP) accredited courses – large modules in both sterile and non-sterile compounding. Combining that with the virtual component, we are hoping learners will be able to practice and learn without the need for using additional PPE, which is in short supply. It also allows learning from home."

A real benefit to current clients during this pandemic has been the day-to-day practice of pharmacy. Operations manager Kelti Verhagen said, "We would normally provide last-minute sick coverage for our client sites, on average, once or twice per month. At the start of the pandemic, we were receiving requests for multiple shifts per day. Filling these requests was a possibility because our staff are already set up to work from any location and we are more than prepared to support hospitals for any potential second wave of COVID-19."

Business manager Sammu Dhaliwall has been busier during the pandemic, with requests from hospitals in preparation for the fall.

"There has been increased interest from hospitals to understand how our team of hospital-trained pharmacists could support any capacity issues to be experienced during the second wave," said Dhaliwall. "Since we have telepharmacy contracts with both Mohawk-Medbuy and HealthPRO Canada, hospitals can very easily 'turn on a switch' to use our services. We have also introduced our Virtual Medication Reconciliation on Discharge (VMRD) program allowing for virtual interviews with patients just prior to leaving the hospital along with a virtual follow-up within 72 hours in the patient's home."

Hybrid cath lab at St. Michael's Hospital is optimized for catheter-based procedures

The room includes advanced ventilation and moveable, easy-to-clean equipment.

BY NORM TOLLINSKY

A new state-of-the-art cath lab equipped with a Discovery IGS 730 angiography system from GE is the first step in a plan to bring cardiac care at St. Michael's Hospital in Toronto into the 21st century. Part of the hospital's Walter and Maria Schroeder Brain and Heart Centre, the ultra-modern cath lab suite, or hybrid room, was commissioned and operational in March just as COVID-19 put a halt to construction of the Centre's other planned cardiac care facilities, including an echocardiogram lab, a structural heart clinic, a dedicated recovery room and three additional cath labs.

"A hybrid room is a room where you can do both catheter-based procedures and surgical procedures," explained Dr. Neil Fam, director of interventional cardiology and head of the hospital's cardiac cath labs. "If you need it to do an open heart procedure or anything else surgical in nature… (in addition to or following) a catheter-based procedure, you can do it in the same room without having to move the patient to an OR.

"It's where we will be doing a lot of our innovative structural heart procedures, including mitral and tricuspid clips, valve replacements, transcatheter aortic valve implantations (TAVIs) and other catheter-based procedures for treating congenital abnormalities such as atrial septal defects and patent foramen ovales, or holes in the heart," said Dr. Fam.

The suite's advanced ventilation system and the aseptic attributes of the imaging device, which doesn't sit over the top of the patient throughout a procedure and can be moved away for post procedure cleaning, makes it ideal for treating patients with infectious diseases, so during the spring and early summer it was primarily used for treating COVID-19 patients with heart attacks.

The mobile, untethered Discovery IGS 730 imaging system is a key enabler of the room's hybrid capability. Unlike fixed floor or ceiling systems, it can be moved aside and out of the way by pressing a button on a control panel, allowing multi-disciplinary teams unobstructed access to patients.

"It allows for more flexibility about where the various team members can be positioned around the patient," explained Dr. Fam. "It's very mobile, so it allows for multiple different configurations of the room. For the average catheter-based intervention through the groin up to the heart, we're standing on the right side of the patient. However, if we're doing a different procedure where we need to go from the patient's head or neck, it allows us to configure things to provide optimal access and make it ergonomic for the procedure.

"The image detector is much larger and the huge 56-inch monitor (on a mobile boom) has the capacity for multiple inputs – whether that's echo, angio, intravascular, or intracardiac imaging. It allows us to import CT scan images and co-register them with the X-ray fluoro images. You can have all of these different inputs up on the screen at the same time, which gives you much more insight into what's happening with your patient.

> **A hybrid room is a place where you can do minimally invasive catheter-based procedures and more open, surgical interventions.**

"The superior imaging has allowed us to see things better and make real-time decisions in a way that we couldn't before," said Dr. Fam.

Earlier iterations of the Discovery IGS 730 were introduced to the market in 2014, but the imaging device with robotic C-arm has been continuously upgraded since then, said Carsten Stevenson, advanced clinical specialist, GE Healthcare.

"The imaging chain is now AI-based and we've made significant progress in dose reduction, image quality, system functionality and integration."

For example, GE has developed software tools that allow for the visualization of ultra-thin stents once they have been placed in an artery – something that's very difficult to see using conventional imaging technology, explained Stevenson.

"This is very important because when you finish doing a coronary procedure and you've fixed the narrowing of the vessel, you want to make sure it has correctly expanded, that there's no malapposition and that there's no calcium around the vessel inhibiting its expansion."

According to Arlene Desousa, product marketing leader for the Discovery IGS 730, the unit at St. Mike's is one of five currently installed in Canada with another six scheduled for deployment this year and next.

Once construction of additional facilities planned for the hospital's Brain and Heart Centre is completed in 18 to 24 months, patients undergoing a structural heart procedure will be able to recover in a new, co-located recovery room with dedicated staff, whereas currently they are transferred to the hospital's ICU.

The Centre's structural heart clinic will be triple the size of the space currently being used and will allow for more virtual consults, teaching and research.

"We will be able to enroll patients in studies or trials all in the same place, whereas right now, half of the research staff is located off-site," said Dr. Fam.

The hospital's cardiology department boasts several other world-renowned practitioners in addition to Dr. Fam, including Dr. Chris Buller, Dr. John Graham and Dr. Mark Peterson. According to Dr. Fam, the state-of-the-art facilities will also help to attract new staff, including international fellows.

The price tag for the completed cath lab suite, including all of the equipment, was a reported $17.8 million and funded by private donations from the Schroeder family and several other donors.

PHOTO: COURTESY OF YURI MARKAROV, UNITY HEALTH TORONTO

GE Healthcare's Discovery IGS 730 angiography system is a key component of St. Mike's hybrid cath lab suite suitable for both catheter-based and surgical procedures. Unlike fixed floor or ceiling systems, the IGS 730 can be moved aside and out of the way by pressing a button on a control panel.

VIEWPOINT

With a second wave of COVID-19 on the horizon, how do we prepare?

Analytics, document management and integrated video are all important for effective patient care.

BY ROBERT AMYOT, MD

Early into the coronavirus pandemic, Montreal-based MEDFAR Clinical Solutions – the developer of a leading-edge EMR, in Quebec and now in British Columbia – shifted its focus to help its users get into COVID-19 response mode. It was all-hands-on-deck, from collecting clinic requirements to fast-tracking product validation with one goal in mind: enhancing the safety and efficiency of delivering healthcare.

Overnight, MEDFAR helped many clinics adopt the complete MYLE virtual care management solution. All the features of the MYLE ecosystem were made available to MYLE users, regardless of their subscription plans.

Now that the initial COVID-19 surge is behind us, how do we prepare for the second wave? We conducted interviews with leading healthcare decision makers, as we believe the second wave is no longer a matter of "if", but "when".

Identifying the most vulnerable patients: With MYLE Analytics, a powerful data analysis feature, clinics can easily stratify their patients and prioritize follow-up visits for groups with higher risk. "Within the first couple of weeks of the pandemic, we were able to send each physician a list of their patients, categorized by their vulnerability codes, by their age and so we actually had a way of reaching out to our most vulnerable patients," said Dr. Mark Karanofsky, unit director of the Herzl Family Practice Centre of the Jewish General Hospital in Montreal.

For Xavier Arancibia, director of operations at GMF Santé-Médic, the problem was "how do we let our patients know we are still open?" He overcame this challenge by identifying patients who had not visited the clinic for a long time with MYLE Analytics.

In addition, monitoring the clinic's response to the pandemic becomes possible with the MYLE ecosystem. Dr. Karanofsky added: "MYLE Analytics is also currently used to analyze data regarding how COVID cases were followed at Herzl, which will provide a lot of insights on our capabilities."

Protecting patients: Minimizing physical contact is key to avoiding the spread of the virus. But without the right tools, it is easier said than done.

> **With MYLE Analytics, for data analysis, clinics can stratify their patients and prioritize follow-up visits for groups with higher risk.**

"MYLE Patient Portal allows us to securely send documents to patients. [Otherwise] we'd be required to set up a secure method of how to email things and get documents to patients, whereas the Portal just closes that loop very, very quickly," Dr. Karanofsky explained.

"We can add anything to the MYLE Patient Portal. All these functionalities allowed us to return to full capacity. If we hadn't had access to these functionalities, I really don't know how we would have done it," says Arancibia.

Choosing a provider available 24/7: With clinics forced to transform their operations abruptly, expert, easy-to-reach support becomes a determining success factor. "I personally feel that the support that MEDFAR has provided has been nothing short of spectacular. The users always have access to support and that really makes it actually very functional," Dr. Karanofsky said.

Robert Amyot, MD, is a cardiologist and entrepreneur. He serves as chief operating officer and chief medical officer at MEDFAR Clinical Solutions. He is also a board member of several organizations, including Royal College International.

The power of fully integrated virtual care: As clinics adjust in real-time to the spread of the virus, they need the proper solutions and knowledge to quickly navigate their entire operation along the physical-virtual spectrum.

Dr. Karanofsky asserted: "If I had to turn the clinic off tomorrow, I could do it. I could even scale up my virtual medicine instantly. And so, I think our ability to respond to that, even though it was fast last time, I think we'd even be faster now."

What will "normal" look like post-COVID? During the pandemic, clinicians quickly discovered that the videoconferencing embedded in MYLE could add new dimensions to the care they provide. "How often can you get to see your patients where they live and their setup? Especially for the elderly patients, what's the home environment? And you can see a lot of trip hazards that are an easy thing to fix," observed Dr. Karanofsky.

He added, "The goal is never to go back to March 12. And our hope is that by using the technology that we have, and expanding on what it can do, to push the envelope and really target at least about 30 percent as remote."

Mr. Arancibia added, "We need to change the way we do things. Telemedicine should play a role, like a triage, that would make it the first line."

Connected Health technologies will improve the quality of care

BY LAURIE LAFLEUR AND SHIRLEY FENTON

Connected Health, which combines digital networks with wearable devices such as smart watches, monitors and mobile technologies, has the potential to dramatically improve the delivery of remote care to patients at home and in the community. Connected health devices and networks are promoting healthy behaviours, encouraging medication adherence and easing the management of chronic conditions.

As of 2019, Connected Health was in its infancy in Canada. However, the COVID-19 pandemic has pushed it into prominence and previous roadblocks are being removed at warp speed.

The emergence of telepresence: Telepresence, the next evolution in telemedicine, leverages a variety of connected health devices to fully immerse remote physicians into the care setting. One exciting example is Catalyst, a platform for real-time clinical collaboration. It was recently launched by Dr. Jeff Soble, cardiologist and associate professor of Medicine at Rush University Hospital, and his team at ASCEND Health Information Technology, in Chicago.

Telepresence leverages a variety of connected technologies to allow physicians to be virtually present in many care settings as if they were there. From providing integrated live audio and video of the room to allow care providers to see, hear, and interact with colleagues and patients. Supporting information is streamed directly from physiologic monitors, procedural devices, and imaging modalities to enable physicians to actively participate in the care of complex patients and cases – without leaving their home or office.

Telepresence in action: Telepresence has recently opened the door for physicians to closely monitor and care for COVID-19 patients in ICU environments. With telepresence technologies, physicians can see and hear their patients in real-time, communicate with nurses, and closely monitor vital signs and medication delivery. By enabling remote interactions, hospitals can gain access to a larger pool of specialized intensivists that may not have otherwise been available, while also reducing PPE requirements and the risks associated with physical interactions.

Shirley Fenton

Laurie Lafleur

Adding further value, the use of telerobotics augments telepresence technologies, extending to physicians the ability to navigate and control their environment. Physicians can remotely control a robot equipped with audio, video, and tactile sensors allowing them to freely move amongst and communicate with patients and colleagues.

In more advanced use cases, telepresence can bring highly specialized interventionalists and surgeons from anywhere into the operating room. In addition to a live overview of the OR itself, remote physicians can view images and information generated from ultra-

CONTINUED ON PAGE 23

Platform eases on-demand shift scheduling of healthcare professionals

TORONTO – The COVID-19 pandemic has stressed some parts of the healthcare system to its limits, triggering an unprecedented worker shortage. Many facilities were short-staffed when the virus struck, and still are, making it difficult to provide appropriate care to patients.

"Healthcare facilities are dealing with strained resources and IT that isn't keeping up with demand," said Raul Rupsingh, chief technology officer at BookJane, a cloud-based staff optimization and communication health technology platform. "Time-consuming activities, like shift scheduling, resource allocation, and communications are often being done manually, and this process is made even more painful when dealing with the unprecedented circumstances we find ourselves in."

Since the coronavirus pandemic began, BookJane's technology has been adopted by hospitals, long-term care and retirement facilities in Canada to quickly bring healthcare professionals into action when and where needed.

The proprietary BookJane J360 platform allows any healthcare facility in the province to immediately broadcast a service request to healthcare professionals, based on proximity, preferences and availability.

The requests appear directly on the platform's mobile app, available on Android and iOS, to ensure instant response time and acceptance of the request.

BookJane is working with the Ontario Medical Association (OMA) to get all Ontario physicians onto the mobile platform. Physicians can register and within minutes can see where there is a need for their services.

"COVID-19 impacts everybody and we are proud to provide a solution to help meet the evolving needs of our healthcare system and frontline workers as they deal directly with this crisis," said Curtis Khan, CEO and founder of BookJane. "In healthcare, time is everything. And our system will save valuable time when Ontarians need it most."

BookJane is currently working with other caregiver associations to migrate their memberships onto the platform so that hospitals may be able to access one hub for a variety of staffing needs. BookJane's J360 platform has delivered over 1 million caregiver service hours to many healthcare clients across the province.

In particular, Ontario's long-term care facilities are currently on the frontlines of COVID-19 breakouts. With the decision to restrict healthcare staff from working at multiple long-term facilities, an already in-demand work force was put under increased pressure.

Personal support workers and registered nurses who haven't fallen ill to the virus themselves, are struggling to meet the needs of residents, leaving seniors in an even more vulnerable environment.

"Currently we are working with over 700 healthcare facilities and providing them access to the highly skilled workforce they urgently require," said Khan. "To curb the effects of the pandemic, we must work together to provide the necessary support to our frontline healthcare workers. The additional support exists and BookJane connects this workforce to where they are required most."

The BookJane platform matches each facility with access to its own pool of workers as well as agency staff, when needed.

BookJane runs on Amazon Web Services (AWS) and relies on the cloud provider's scaling capabilities to ensure it supports the growing demand. In fact, with just the OMA work, traffic spiked four-fold and BookJane did not experience any service downtime.

With the help of AWS partner Onica – a Rackspace company – BookJane was able to architect a solution in the cloud that gives it the flexibility it needs to scale-up and down with demand.

"To supply these hospitals and healthcare facilities with emergency workers, clinicians, and nurses is deeply impactful during this crisis," said Rupsingh.

Canadian expertise in virtual care now deployed in hospitals across the UK

Ottawa-based Aetonix developed a device and platform keeping ICU patients in touch with their loved ones.

BY DIANNE DANIEL

As ICUs in the U.K. surged to capacity at the height of the COVID-19 pandemic, it quickly became evident that life-saving medical intervention wasn't the only critical care required. Giving families and friends under lockdown a chance to see their loved ones, and in some cases whisper a final good-bye, was equally vital.

Thanks to the rapid response of a unique trans-Atlantic partnership, those face-to-face connections not only happened, they flourished – virtually.

It started with a simple idea. Louise Rose, PhD, a Critical Care Nursing professor at the Florence Nightingale Faculty of Nursing, Midwifery and Palliative Care, King's College London, was observing family members desperate to connect with isolated COVID patients while busy ICU staff had no way to facilitate calls other than through personal smartphones.

Recalling her collaboration with Aetonix Systems Inc., a Canadian virtual care start-up she had been working with prior to moving to the U.K. in January, she immediately thought of the company's aTouchAway communication and information sharing platform as a possible solution.

She took her idea to Dr. Joel Meyer, a critical care consultant at Guy's and Thomas' Hospitals in London. As it happened, Dr. Meyer had already been investigating secure virtual visits for the ICU and in late March, they reached out to the Ottawa-based company. Within days, the Life Lines ICU project was launched, a philanthropic endeavour to connect families to their loved ones.

ILLUSTRATION: LINDA WEISS

"Looking back on it, it was crazy," said Dr. Rose. "We were working 16 hours a day and we were very lucky at that same time that things came together."

Aetonix wasn't set up to do business in the U.K., but when founder and CEO Michel Paquet received the call, he says he knew he needed to help.

The company connected with Amazon Web Services to quickly scale-up its cloud-based environment overseas. Its team then configured a simple-to-use ICU communication care pathway, and by April was onboarding hospitals onto aTouchAway at a rate of 10 per week. The goal was to make it extremely simple and efficient for busy ICU staff to connect people, said Paquet.

"It sounds easy, but when you hear Dr. Meyer explain what an ICU looks like in a rush like this, when they're all loaded with PPE and gloves and masks, and panic is hitting the roof, you don't have time to install an app, sign in with an account and press a few buttons," said Paquet. "It has to be go, go, go!"

Life Lines is a unique partnership of clinicians, academics, companies and charities. Backed by King's College London, King's Health Partners, the True Colours Trust, the Gatsby Charitable Foundation, British Telecom (BT), Google, Samsung and MobileIron, the initiative is now providing 4G-enabled tablets to more than 170 ICUs within the UK National Health Service (NHS).

Tablets are pre-loaded with the scaled down version of aTouchAway to enable secure communication between COVID patients and their loved ones, and each NHS organization is provided with

Ontario virtual care clinic sees demand 'go through the roof'

Another Ontario-based virtual care service that quickly ramped up in March when COVID-19 cases were peaking is Ontario Telemedicine Network (OTN), now part of the new Ontario Health government agency. An early provider of virtual care services, OTN has provided the opportunity for either direct-to-patient or hosted e-visits for many years.

Almost overnight, direct-to-patient visits surged from 350 concurrent events per day to 2,500 per day, said OTN vice-president Technology and Services Sharon Baker, eventually leveling off at about 2,000 per day.

"We had prepared but we just hadn't estimated how significantly our volumes would increase and how quickly that would happen," said Baker. "We had to do some significant and quick adjustments to add capacity in order to meet demand, but we were able to do that."

According to OTN's COVID update, 22,000 new account requests were made between March 1 and the end of May, with 740,000 virtual visits conducted. When hosted visits – where patients visit a medical site close to them to connect with a remote care provider – dropped off at the height of the pandemic due to lockdown restrictions, direct-to patient consults "went through the roof," said Baker, prompting several partners to join together to launch the Ontario Virtual Care Clinic (OVCC).

A collaboration between the Ontario Medical Association, OntarioMD, Ontario Ministry of Health and Ontario Health, with funding provided by Canada Health Infoway, OVCC is staffed by roughly 200 licensed Ontario physicians.

Novari Health of Kingston, Ont., is providing the virtual waiting room capabilities through its eVisit virtual care software system, and quickly created a COVID-19 Emergency Response Team to work with OTN to design, build, test and deploy the virtual clinic.

In a statement, Novari Health president John Sinclair said: "Never in all my years have I witnessed a team come together with such a sense of purpose, drive and determination to improve access to care … our team accomplished things in a few weeks that I previously would have thought impossible."

OVCC is designed to treat non-urgent health concerns such as colds, cough, flu, allergies, women's health issues, chronic disease management, pain, urinary tract infections, rash and medication questions. It is not intended to replace regular care, but to allow access to primary care physicians from the comfort of home at a time when everyone is being extremely vigilant about reducing public outings to stop the spread of coronavirus.

Patients who access the service at www.seethedoctor.ca require an Ontario health card, internet access, email address, mobile phone number to receive text notifications, and a device with a camera and microphone. When they sign in, they enter a virtual waiting room and are advised on their estimated wait time to see a physician.

Earlier this year, Ontario Health used Amazon Web Services to quickly scale-up its virtual clinic.

The speed with which the virtual clinic launched is a direct result of ongoing work to advance virtual care in Ontario. OTN had previously conducted five proof of concept projects across the province to evaluate virtual visits between patients and providers, including how to bill for virtual visits.

In March, the province introduced temporary virtual care billing codes, which apply to both telephone and video visits, and a more permanent policy change is being negotiated.

"It's really about using integrated virtual care as one of the modalities, based on clinical appropriateness," said Baker, adding that the telephone still has a role to play. "We've been saying for years that the future of healthcare is virtual care, but the future arrived on about March 2."

Not all care providers who sign up with OTN are conducting virtual visits. Baker said there's a significant cohort that have embraced it for the majority of their patient visits while others are conducting sporadic video visits, and a small group haven't held any. Meanwhile, OVCC continues to grow.

"COVID was the burning platform to force people to try it, because what else was their option? Their option was not to have care," said Baker, "and now that people have seen the look and feel, I think it will be very hard for us to go back."

a digitally secure dashboard to enrol their patients.

BT centrally manages tablet configuration and performance, tracking the tablets remotely so they can be disabled if they leave the hospital premises. Invited family members sign an end-user licence agreement with Aetonix which states that their contact details will be permanently deleted when the patient is removed from the platform.

In order to make ICU virtual visits as seamless as possible, Aetonix kept functionality to a bare minimum. When an ICU staff member wants to initiate or schedule a call, they simply pick up the next available tablet, search for their patient in the dashboard and click on the family member listed.

Because the tablets were deployed at the height of U.K.'s COVID surge, when entire ICUs were devoted to treating COVID patients and some hospitals were forced to set up multiple ICUs, there was no time for training.

"We literally delivered tablets into the ICU with a set of instructions as to how to use aTouchAway," said Dr. Rose. Now that she has had time to conduct follow up, she added, the overriding message is "it's so easy to use."

Not only do the virtual connections allow for tough good-byes to be said, but for those who recover, there are often virtual parties, pet visits and in one instance, even a successful marriage proposal.

"There's always been a need to enable a way for families to be present in the ICU without being physically there," said Rose. The pandemic was the driving force to quickly ramp up secure ICU virtual visits, but now that they're happening, the goal is to keep the option in place. "COVID has calmed down somewhat in the U.K., but what we're seeing now is that some centres are transitioning to using this as an ongoing family visiting platform," she said.

Moving forward, Life Lines is working with Aetonix to develop a critical care recovery pathway, possibly adding a diary function so notes taken by clinical staff while an unresponsive patient is on a ventilator can be shared with family members.

"I'm a big believer that if we want to learn from this crisis, it's that virtual care really needs to offer a complete service," said Paquet. "That's my vision and that's where we're leading our team. How do we enable professionals and patients to be guided for their disease or condition so that in the future if such a thing happens, it's okay, we're all organized?"

In addition to the work it is doing with Life Lines across the ocean, Aetonix is also providing multiple virtual care pathways to healthcare providers in Canada. Each pathway developed includes assessment material, a workflow to guide the care team, patients and other members of their circle of care on what actions will be taken when, and educational material to further their understanding of the specific condition.

Pathways are currently available for chronic obstructive pulmonary disease (COPD), diabetes and multiple condition care, as well as for staff screening for COVID-19. A new initiative is also providing a mechanical ventilation care pathway to support patients and parents of young children who need to use ventilation equipment at home. As Paquet explained, pathways can as simple or as complicated as necessary, depending on the need.

Tech allows nurses to make virtual rounds

CONTINUED FROM PAGE 10

any hardware aside from their existing smartphones, although the COVID-19 patients were also provided with an oximeter, which measures oxygen saturation through a non-invasive fingertip device.

Working with the Ontario Telemedicine Network (OTN), the region didn't have to go through a request for proposals (RFP) process, as Plano, Texas-based Vivify Health has been a vendor of record for OTN's remote patient monitoring programs since 2017.

Vivify's Remote Patient Monitoring (RPM) platform boasts more than 90 clinical and engagement pathways. Users can modify the content, or create their own custom pathways.

In its 10-year history, Vivify claims a record of 97 percent patient satisfaction, 65 percent readmission reduction and 8.2x return on investment.

Q&A with Dr. Essam Hamza: A take on the future of virtual care

VANCOUVER – Having operated family practices for over 20 years, Dr. Essam Hamza wanted to address the problems he was seeing as a physician in his practice. He took action and developed a suite of technologies to help clinicians better manage their costs and become more efficient, while providing a better patient experience; he established CloudMD Software and Services to do this in 2018.

As CEO of CloudMD, Dr. Hamza oversees a company which is digitizing delivery of healthcare by providing patients access to all points of care from their phone, tablet or desktop computer. The company offers SaaS-based health technology solutions to medical clinics throughout Canada and has developed integrated solutions delivering quality healthcare through a combination of connected primary care clinics, telemedicine, and artificial intelligence.

CloudMD currently provides service to a combined network of 376 clinics, over 3,000 licensed practitioners and almost three million patient charts through its technology components.

In this Q&A, we obtain Dr. Hamza's views as a physician and technological innovator in the Canadian healthcare system.

CHT: With the emergence of COVID-19, virtual health has come to everyone's attention, seemingly overnight. Why do you think it has taken so long to reach the mainstream?

Dr. Hamza: As a physician, I understand first-hand the pain of operating a practice. When physicians graduate, they are immediately thrown into the system, and are expected to know how to manage costs, how to operate a business profitably and so on. So, I can appreciate why physicians sometimes resist new technologies and/or new ways of doing things.

With the emergence of COVID-19, there has been a unique convergence of thought and acceptance around virtual medicine – patients, providers and government payers all saw the need and inherent value in this approach, and so adoption and implementation occurred very quickly.

CHT: Do you think virtual medicine is here to stay?

Dr. Hamza: Yes, no question, virtual medicine is here to stay for a host of reasons. Patients have found telemedicine to be a convenient and easy way to access physicians. GPs appreciate that 70 percent of the services they perform can be done virtually, so virtual medicine enables them to be efficient, while still allowing them to see patients when they absolutely need to.

Equally, governments are pleased when citizens get better access to care and operating costs are reduced. It's a win-win-win scenario.

In addition, within practice management, we are seeing operational changes occur with the emergence of "hybrid clinics" where clinicians switch seamlessly between virtual patients and patients presenting in-person. This is a more efficient way to leverage clinical resources and I don't think you'll see this model disappear.

Lastly, virtual care solutions can be easily integrated into practices and serve as a platform to bolster continuity of care, easily managing patient transitions to specialists, mental health counselors or therapists as well as pharmacists.

Dr. Essam Hamza, CEO of CloudMD

The patient is assured that everyone is better connected and all working from a common set of records. This results in better patient outcomes, which is ultimately where cost savings occur, not to mention better patient engagement and satisfaction with care.

CloudMD has been focused on this vision of longitudinal care since its inception – our hope is that the widespread acceptance and adoption of telemedicine will bring this into reality for everyone.

CHT: What changes, if any, do you see on the horizon?

Dr. Hamza: At CloudMD, we've always taken a patient-centric view of care, with a keen desire to support a patient's journey as they navigate through the healthcare system. This was our rationale for developing a fully integrated and secure platform underpinned by an EMR system called JUNO (originally based on OSCAR open source code), an integrated billing system, and patient portal (to allow patients to schedule and manage appointments).

While governments allowed mainstream video-conferencing solutions to be used at the onset of COVID, I think you will see them start to require the use of secure, health-grade solutions very soon.

As well, clinicians will re-examine some of the technologies they initially chose to deliver telemedicine, as in some cases their experiences have not been positive.

Third, I think the connection between delivery of physical and mental health services will become more intertwined. COVID-19 is putting significant strain on people throughout society, and with GPs being on the front line of healthcare delivery, they'll need a seamless, integrated and easy way to help patients assess their situations, and refer them to mental health professionals in their communities.

Lastly, it is imperative to affordably deliver telemedicine services to remote sites throughout Canada (which are, in many cases, indigenous communities). The current practice whereby residents travel outside communities to obtain health services – or having a clinician visit from outside the community – is simply fraught with too many gaps and risks, not to mention complicated extensively by the impractical aspects of self-quarantine. It is really important governments work quickly to address the healthcare needs of these communities by leveraging proven telemedicine technologies.

Our recent acquisitions reflect the evolution of healthcare access we envision at CloudMD; please visit www.cloudmd.ca to learn more.

AI-powered app finds latest COVID info

CONTINUED FROM PAGE 4

is our hope that COVID AIKnowledgeEnable will provide users with an effective tool in managing the pandemic and getting on with our lives," said Maynard. "Controlling the virus will be the key to re-igniting the global economy, while more effective information access and exchange helps medical professionals, policymakers and the public to make better informed decisions with the most up-to-date and relevant data in one integrated platform.

Clinicians and the public can access the app via a small monthly subscription fee of US$1.99 a month for the standard version and US$2.99 a month for the medical professional version. A 14-day free trial is also available for all users. The web version is available now at https://app.aiknowledgeenable.com. It will be available on Google Play and Apple stores on October 15.

e-Health 2020 showed progress in virtual care for First Nations communities

BY EILEEN MCPHEE

Over 700 people gathered online for the e-Health 2020 Virtual PopUp Conference in July to connect and learn from presentations like Mobilizing Artificial Intelligence in the Real World, Filling Mental Health Gaps with High-Tech, and Virtual Care.

In addition to the plenaries and panel presentations, attendees shared more than 2,500 messages through the conference app. In-app community discussions grew from questions such as "Is COVID-19 a catalyst for virtual care?" and "Change Management: how can patients and providers be better supported with a smoother transition?".

Attendees connected online by creating over 86 community board discussion topics based on shared language, region, and interest in subjects like Virtual Care for Seniors, Patient Engagement and Patient Identification, Engaging Customers in Digital Health, and Indigenous Care, a forum created to discuss digital and virtual health activities taking place in First Nations Communities across Canada.

The Indigenous Care forum was started by Nancy Gabor, Virtual Care Strategist, Mustimuhw Information Solutions Inc., asking: "What digital or virtual care innovations are emerging for indigenous communities in Canada as a result of COVID? What short- or long-term trends to you see emerging?"

Attendees contributed examples of virtual health projects underway across Canada connecting people living in remote communities with healthcare and health services. Examples include:

• Heart patient Adamie Amamatuak, who wished to return home to Puvirnituq, Nunavuk after cardiomyopathy surgery at McGill University Health Center (MUHC) – more than 1,600 kilometers away. Nurse practitioner Stéphanie Ben Hamron stepped in to provide distance education to staff at the Innulitsivik Health Center so they could care for Mr. Amamatuak (and his new mechanical heart) where he felt most comfortable – in his home.

• First Nations Virtual Doctor of the Day program, a unique service for First Nations people in British Columbia and their family members that enables people with limited or no access to doctors to make virtual appointments. The intent of the program is to enable more First Nations people and their family members to access primary healthcare closer to home. The program includes doctors of Indigenous ancestry, and all doctors are trained to follow the principles and practices of cultural safety and humility.

• Mustimuhw Information Solutions (MIS), a BC-based organization working with industry leaders in virtual care to develop targeted solutions focused on Nations-based care models. These tools help providers stay in touch with clients and each other to reduce avoidable travel, missed appointments and prevent exacerbations that would require clients to travel for care. MIS is working to empower First Nations Health Centres to provide their best care, from anywhere. Learn more about MIS here.

"Canada's First Nations have excellent healthcare programs in their communities and knowledgeable, committed local healthcare providers," said Nancy Gabor, virtual care strategist, Mustimuhw Information Solutions (MIS). "However, geographic distances and access to healthcare resources can make it difficult or dangerous for clients to meet with their providers when they need care."

She added, "Telehealth can serve a vital role in First Nations communities allowing clients to reach out for care digitally, helping providers to connect with each other to strengthen care teams, or enabling secure transmission of personal health information between clients and providers.

"MIS addresses these gaps by helping Nations-based providers and their clients communicate, share, and store information over distances securely and seamlessly."

Ontario ramped up virtual care, and is now exploring more options

COVID-19 has led to an unprecedented surge in the use of virtual care in Ontario. Virtual visits – by video, audio, or telephone – allow patients and healthcare providers to connect safely at a distance for routine care, minimizing risk. Remote monitoring, meanwhile, lets care teams track the progress of at-risk patients, such as those who may have tested positive for COVID-19 but do not need hospitalization.

Ontario's Ministry of Health has encouraged providers to use virtual care whenever possible during the pandemic. Demand has been high. Between late February and mid-July, OTN, the province's primary virtual care delivery partner and a business unit of Ontario Health, the provincial agency overseeing care delivery, activated more than 20,000 new accounts.

Total direct-to-patient clinical video visits through the Ontario Virtual Care Program, or using OTN video technology, rose from 115,275 in March to 206,198 in June – and those numbers did not include services offered outside the provincial platform, such as telephone calls. Virtual care is an increasingly mainstream delivery channel, offering benefits that include convenience, high satisfaction, strong outcomes, and safety.

While the groundwork for virtual care expansion in Ontario has been many years in the making, several models of care, tested through pilots, were quickly adapted, and implemented, to assist in the COVID-19 response. That work has revealed additional opportunities, all of which are under consideration as system leaders plan for the possibility of another COVID-19 wave coinciding with flu season. Among the areas for potential virtual care expansion beyond primary care: emergency services; elective surgery support; mental health and addictions; and long-term care.

Emergency services: Virtual models of care in emergency departments can assist in assessment, allow providers to offer clinical advice, and direct patients to appropriate care settings, relieving pressure on hospitals. Patients seeking medical care or advice and who may be considering a trip to an emergency department, for instance, could log on to a hospital webpage that includes a live link to initiate a virtual visit.

They could then be triaged and prescreened remotely, either by an actual nurse (using digital tools) or an artificial intelligence chatbot (using sophisticated algorithms). Next, they could be placed in a "virtual waiting room" to see a physician or sent a scheduled time for a virtual visit via text or email. If necessary, patients could also be redirected to an in-person emergency department assessment.

In May, Ottawa-based CHEO became Canada's first pediatric hospital offering a virtual emergency department. Families are asked first to try to connect with their primary care physician or pediatrician, but if they are unable to, they can visit www.cheo.on.ca, where, after completing a self-triage assessment to determine appropriateness, they can book a same day video visit with an emergency physician specializing in pediatric care, avoiding the need for an in-person hospital visit.

The Electronic Canadian Triage Acuity Scale, or eCTAS, developed by Cancer Care Ontario (now a business unit of Ontario Health), is used in 115 Ontario hospital emergency departments, primarily to help front-line nurses calculate an acuity score based on combinations of 169 different presenting complaints – such as chest pain, confusion or vomiting – and more than 400 other variables, including pain level or fever. More than 90 per cent of emergency patients in Ontario are currently triaged using eCTAS, which also shares real-time data, including infection-control updates from Public Health Ontario. Research has demonstrated eCTAS improves triage consistency and accuracy – and Ontario Health's OTN and Cancer Care business units are exploring

ways it might be further leveraged in pre-hospital assessment.

Optimizing elective surgeries: As Ontario's hospitals have begun to resume elective surgeries temporarily postponed during the initial COVID-19 wave, virtually enabled models of care could potentially be expanded to streamline pre- and post-surgical care while minimizing in-person contact to prevent additional outbreaks. Among the potential benefits: improved coordination of care, streamlined patient throughput, reduced length of hospital stays, minimized readmissions, and a better overall patient experience.

Pre-operative care options include assessment – pre-anesthetic consultations, among them – patient education and instruction, and advance discharge planning. St. Joseph's Health Care Hamilton, for one, has pioneered a virtual care model that keeps surgical teams connected to patients and home care providers using telephone, video, and the hospital portal.

Surgical transitions solutions, used by care providers including William Osler Health System, University Health Network and Scarborough Health Network, can improve patient engagement, support and monitoring both before and after surgery, boosting outcomes and efficiency. (Current Ontario vendors of record available through Ontario Health include SeamlessMD, Vivify Health and InTouch Health.)

Surgical process management tools (such as Novari ATC, available via standing procurement through Thunder Bay Regional Health Centre), are currently being used by 30 Ontario hospitals to organize and manage surgical caseloads, in some cases across regions. More intensive remote patient monitoring (RPM) can also assist in earlier discharge and improved post-op care. Ontario Health (OTN), for example, offers an RPM platform with protocols to support post-acute care.

Connected Health tech will improve care

CONTINUED FROM PAGE 16

sound, ECG, fluoroscopy, or scope imaging and advise technologists and other physicians on how best to triage and treat patients in real-time.

When augmented with telerobotics and other connected technologies, physicians are able to perform complex invasive procedures remotely – from routine appendectomies and hernia repairs to complex image guided procedures such as cardiac catheterization and spinal fusion.

This technology can greatly reduce the time and cost associated with moving patients or providers when specialized consultation is required – something that may not be possible when critical illness or injury is involved. In rural or lower-income communities in particular, where access to specialized providers is limited, telepresence can help close the gap to ensure consistent and reliable access to high-quality care for all Canadians.

Learning more: McMaster University and the National Institutes of Health Informatics Canada (NIHI) are offering a joint certificate in Connected Health and the Internet of Things (IoT). In this 10-session course, participants will explore various Connected Health technologies, learn how they can be successfully integrated and adopted into Canadian healthcare settings, and understand the unique privacy, security, and ethical factors that must be considered. Register today: https://www.nihi.ca/index.php?MenuItemID=594

Laurie Lafleur is a professor of Health Information Science and Health IT consultant. With 20 years of experience in the MedTech industry Laurie has successfully stewarded healthcare organizations of all sizes and profiles through digital transformation strategy, procurement, and adoption. Shirley Fenton, a long-time member of the University of Waterloo, is the vice-president of the National Institutes of Health Informatics and a co-founder of Waterloo MedTech. She has over 30 years of experience in information technology and business development and is passionate about stimulating innovation in health care.

ARTIFICAL INTELLIGENCE MEETS COLLECTIVE INTELLIGENCE

COVID AIKnowledgeEnable

Try it for free today: RealTimeMedical.com

REALTIME MEDICAL