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Healthcare Technology

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INSIDE:

PHOTO: LUMECA HEALTH INC.

Startup working to bring healthcare to First Nations

Lumeca, a Saskatchewan-based healthcare technology company, provides remote access to licensed doctors via audio and video communications for Saskatchewan residents with valid health cards, including those on the Cowessess First Nation, and is making inroads into Manitoba. Pictured are Chief Cadmus Delorme, Cowessess First Nation (left) and Shawn Hazen, Founder Lumeca Health (right). **SEE STORY ON PAGE 20.**

Canada's healthcare system scores poorly against peers

BY NORM TOLLINSKY

The Commonwealth Fund's 2021 report comparing the healthcare systems of 11 developed countries ranked Canada in 10th place, ahead of the United States, which was at the very bottom. Finishing ahead of the U.S. is nothing to be proud of, contends Dr. Paul Woods, a former president and CEO of London Health Sciences Centre.

"Because Canada finishes ahead of the United States, people say 'ha, we're better than the Americans,' but we're second last out of 11 countries. That is not acceptable, so taking this Commonwealth Fund report, removing the U.S. and recognizing that we're dead last would be a great thing to do."

The Commonwealth Fund is a U.S.-based private foundation with a mission "to promote a high-performing healthcare system that achieves better access, improved quality and greater efficiency, particularly for society's most vulnerable."

The 2021 report, released in August, compares 11 high income countries – Australia,

> **Canada placed 10th in equity and healthcare outcomes and ninth in access to care.**

Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States – using 71 performance measures across five domains, including access to care, care process, administrative efficiency, equity and health outcomes.

The data used in the report comes from Commonwealth Fund surveys conducted in each country, as well as from the Organization for Economic Co-operation and Development, and the World Health Organization.

Canada placed 10th in equity and healthcare outcomes, ninth in access to care, seventh in administrative efficiency and fourth in care process.

Dr. Woods, who describes himself as a "policy wonk" with an interest in health policy and system transformation, wasn't surprised about Canada's poor ranking in access to care, which reflects wait times and affordability.

"When I was at London Health Sciences

Canada's healthcare system scores second last out of eleven countries

CONTINUED FROM PAGE 1

Centre, I was shocked and dismayed to find how long it would take patients to obtain total hip and knee surgeries. It was an average of a year and in some cases just short of two years. Since the pandemic, I suspect it's now even worse."

Canada also scores poorly in access to primary care. "The Netherlands, which ranked first in access to care, has an incredible primary care model, where if you have a need, you can pick up the phone and have that need satisfied immediately, whether it's a telehealth visit or after hours," noted Dr. Woods. "The standard Canadian answer to a need at 2 am is to go to Emergency, which is a terrible answer."

In the Netherlands, general practitioners are required to provide at least 50 hours of service between 5 pm and 8 am annually in order to maintain their professional licences, according to the Commonwealth Fund report.

Only 34.7 percent of Canadians reported they could get an appointment with a doctor or nurse either the same day or the next day, compared with 61.5 percent of respondents in the Netherlands.

According to Dr. Karim Keshavjee, who trained as a family doctor and now works for the University of Toronto's Dalla Lana School of Public Health, the biggest problem with primary care in Canada is that we don't do enough to care for people who are at highest risk of poor outcomes – the working poor, who are scraping by on the minimum wage, working two jobs with no health benefits, struggling to pay their rent and surviving on junk food.

"We need to change how doctors practice," he said. "We still wait for these patients to come to us, but health is the last priority for someone working two jobs."

Too many Canadians – especially the working poor – don't even have family doctors, he complained. Instead, "we've taken the shortcut to healthcare access, which is walk-in clinics and emergency departments. But that's not access to good healthcare."

Despite having universal healthcare, Canada also scores poorly on affordability, especially for psychotherapy and pharmacare. Ontario, for example, doesn't pay for

Dr. Karim Keshavjee

Dr. Paul Woods

psychotherapy unless it's performed by an MD or a nurse practitioner. Psychologists and social workers, who are among the best qualified to provide counselling, aren't covered by the Ontario Health Insurance Plan, complained Dr. Woods.

Prescription drugs are covered in Ontario for those over 65 or under 24, low income earners who qualify for the Trillium
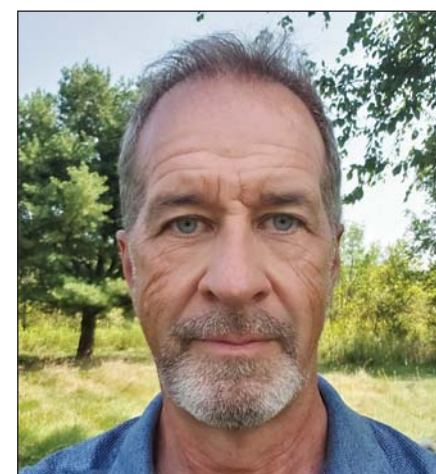
Drug Program and employees enrolled in employer sponsored insurance plans, but that still leaves many Ontarians paying out of pocket.

Canada's demographics contribute to its poor ranking in healthcare equity.

Citing the example of the federal government's COVID Alert cellphone app, Dr. Woods questioned the extent to which marginalized Canadians, including the homeless, new immigrants and Indigenous people, took advantage of it. "We deploy these programs for white, affluent people and end up worsening health disparities," he complained. "It's very easy to get care to white, affluent people because they watch CBC News and use the Internet."

Poor rankings in access to care and equity are inextricably linked to poor health outcomes measured by preventable mortality. New immigrants, for example, access primary care less often for chronic disease management and are at greater risk for poor outcomes.

Canada's vast geography also impacts on equity, notes Dr. Woods. "If you live in Ignace, Ontario (245 kilometres northwest of Thunder Bay), or in Toronto, you should have the same ability to access primary care, but we have a maldistribution of healthcare resources in Canada. If you look at healthcare outcomes in these small, rural areas, they're way worse than they are in urban centres like London, Toronto and Ottawa. Geography does determine whether you live or die, particularly for Indigenous people."

Another problem with Canada's primary care model, according to Dr. Woods, is that physician payment is not aligned with health system goals. "Physicians are paid for doing a transaction, not for obtaining some sort of global health outcome. If you come in with a sore knee, we

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MindShift CBT app helps people cope with anxiety without going out

BY NEIL ZEIDENBERG

During the COVID pandemic, feelings of stress and depression have overwhelmed many people. And in this era of the smartphone, for some form of relief – especially when they can't reach a therapist – many have turned to using mental health apps.

One of the most popular apps is a made-in-Canada solution called MindShift CBT. It was developed by Anxiety Canada, a not-for-profit organization, and it's free for everyone to download through the AppStore for Android and iOS devices.

Anxiety Canada says MindShift CBT uses scientifically proven strategies based on cognitive behavioural therapy to help users learn to relax and be mindful, develop more effective ways of thinking and use active steps to take charge of their anxiety.

"Cognitive Behavioural Therapy is the gold standard approach to highly effective treatment of anxiety and depression," said Judith Law, CEO of Anxiety Canada. "It's a structured therapy for anxiety, researched for decades. It helps individuals identify and change how we think and what we do."

A new version of the app was released in 2019 before the pandemic. Law pointed out there's been a surge in use and downloading of the MindShift CBT app since early 2020, with the highest activity happening in April of last year. "In April of 2019 there were about 41,000 active users. By April of 2020, that number more than doubled to 87,000 active users," said Law.

MindShift CBT is available to all Canadians and to users worldwide. They can use the app alone or with a health professional – completely free of charge. "MindShift CBT teaches people how to manage their anxiety and can be especially helpful to do CBT homework when working with a therapist. Having the app available to everyone means people no longer have to suffer in silence thinking that they alone are having these symptoms and problems," said Law.

The app has a number of unique features., including a Check-In slider that Anxiety Canada calls MS Face, which tracks an individual's moods over time. There's also a Thought Journal that promotes healthy thinking, coping cards, and a Chill Zone that teaches individuals how to relax their minds and bodies, such as through calm breathing. "CBT teaches people how to take action on facing their fears. They learn to get comfortable with being uncomfortable," said Law.

Anxiety Canada has been offering an innovative group-based online therapy program called MindShift CBT Groups – an eight-session group therapy program for adults 19 years and older moderated by a registered clinical counsellor.

Classes are via Zoom and participants learn about anxiety and various behavioural strategies to help them cope in a more positive manner. All topics discussed are private and confidential, and participants are required to complete a weekly assignment using the MindShift CBT app.

Feedback for the app has been very positive, especially from members of the professional community. Dr. Craig N. Sawchuk, a clinical psychologist at the Mayo Clinic in Rochester, Minn., said, "MindShift CBT is an exceptional app that dramatically improves access to evidence-based cognitive behavioural skills. We routinely and highly recommend this app to our primary care and family medicine patients to help support their engagement in and progress towards their treatment goals."

Dr. Sawchuk praised MindShift CBT for its user-friendly design, its ability to track progress, and its ability to be customized to suit the needs of the user. He also noted the effectiveness of its evidence-based knowledge, and its promotion of skills such as exposure, behavioural activation, cognitive challenging, and mindfulness.

In 2015, Forbes named MindShift CBT as one of the top 11 fitness apps in the world. All user information is kept confidential and stored safely in the cloud. No information is ever shared with a third party, and users can delete their account anytime.

MindShift CBT and MS Groups is funded completely by donations and grants. It currently receives no government funding. New this Fall is an online chat feature called Community. "We received funding for this through the RBC Foundation," said Law.

While the COVID pandemic has boosted the use of mental health apps such as MindShift CBT, they will probably continue to be widely used, even after the pandemic subsides.

"There were already a lot of vulnerable Canadians struggling prior to the pandemic," said Law. "COVID has exacerbated the problem, leaving many individuals worse off. And demand for therapy is huge. Across Canada, there's currently a waitlist of three to six months to connect with a therapist."

Virtual pharmacist services have emerged during the pandemic

BY JUSTIN COOK

The COVID-19 pandemic caused significant logistical, resource and staffing pressures in Critical Care Units at hospitals across Canada. For assistance, many hospitals have reached out to North West Telepharmacy Solutions (NTS) to provide virtual clinical pharmacist support to their over-taxed CCUs.

As a provider of 24/7 clinical pharmacy services for inpatients across Canada, NTS quickly ramped up a tailored Critical Care Clinical Program around the needs of COVID-19 patients.

Significant movement of Critical Care patients between community and tertiary care hospitals during the pandemic was an important consideration in the development of the program.

NTS worked with hospitals to gather current COVID-19 treatment recommendations and put them into easy-to-use reference documents for hospitals. This was no small task given that information was changing rapidly.

Previous and new clients have contracted NTS to virtually review and monitor patients and their medications in their COVID 19 units. It was determined that electronic communications were best suited to this environment to minimize phone interruptions for caregivers in personal protective equipment and isolation rooms.

To make recommendations, the virtual pharmacist uses a combination of:
• Existing evidence-based tools developed by the hospital
• Checklists to identify potential medication related issues, and
• Standard documents

Using the NTS program, the pharmacist and the client have ready access to the most current published guidelines and scientific evidence.

As a long-standing client with 24/7 pharmacy care, including telepharmacy on weekends and overnight, the NTS Critical Care Program has been operating at Thames Valley Group of Hospitals, in southwestern Ontario, since early 2021. The Director of Pharmacy at Woodstock General, says: "Clinical leads at Northwest Telepharmacy are always looking for ways to maximize patient safety, optimize workflows and improve patient outcomes."

For his part, Sammu Dhaliwall, pharmacist and Senior Manager of Business Development with NTS, explains how NTS will be remotely involved within the medication review process.

"We have access to secure virtual care technology allowing our pharmacists to have real-time, face-to-face conversations with patients during their hospital stay. Incorporating the virtual care tech-

> **Using the NTS program, the pharmacist and the client have ready access to the most current published guidelines.**

nology prior to the patient leaving the hospital, our pharmacists can converse and educate the patient all the while."

With declining COVID cases, NTS is now adapting the program to include other critical care issues. It has been shown that patient outcomes are improved when pharmacists are included in healthcare teams. This includes critical care where inclusion of pharmacists reduced not only adverse drug events but also length of stay in ICU and death rates.

Information from 2019 shows that in Ontario pharmacists are available in critical care units for 7 to 9 hours per day during weekdays and about 5 to 6 hours per day on weekends. Since events in critical care happen anytime, day or night, NTS can help hospital pharmacy departments support their critical care units during the day, but also around the clock.

"The service can be tailored to whatever a hospital site needs," says Kevin McDonald, pharmacist, founder, and Director at NTS. "We can provide order verification, medication monitoring and virtual rounds for hospitals wanting complete critical care coverage. NTS can also offer evening, overnight and weekend coverage for hospitals that currently only have daytime critical care pharmacy staff."

Justin Cook is a licensed pharmacist based out of Ontario with over 20 years of hospital pharmacy experience, including extensive work in Critical Care and Antimicrobial Stewardship. NTS Virtual Health Solutions is Canada's leading telepharmacy provider of remote hospital pharmacist services working with over 60 hospitals across Canada.

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Response to COVID created collaborations to improve access to DI

TORONTO – At the height of the COVID pandemic, it was crucial for hospitals to focus their attention on patients who had contracted the novel coronavirus and others who required acute urgent care. During COVID, Canadian hospitals did an excellent job of maintaining their high standards of care for patients requiring urgent care across the entire spectrum of illnesses.

At the same time, screenings for conditions that are leading causes of death like cardiovascular disease and cancer were more challenging to access. The net result was that far fewer such tests were being performed in hospitals, which created the danger that many issues, if unattended, could soon turn into more urgent problems.

Indeed, the Canadian Association of Radiologists recently reported that the volume of Diagnostic Imaging exams across Canada in 2021 had still only recovered to 75 percent of their pre-COVID levels. In June of 2021, the Ontario Medical Association reported that a backlog of over 16 million such procedures existed in the province, led by MRI and CT exams.

As the numbers of COVID patients have dropped in recent months, Canadian hospitals have returned to conducting more diagnostic imaging exams with the Ministry of Heath requesting that hospitals attempt to provide 115% capacity to reduce the backlog. To meet this challenge, many hospitals have formed closer partnerships with Independent Health Facilities (IHFs).

One of these IHFs, KMH Cardiology Centres, has been working more closely with community and hospital physicians since the start of the pandemic. The 10-clinic chain, which offers specialist consultations, diagnostic imaging (DI) including PET/CT, MRI, and cardiology tests across the province, received a surging number of urgent referrals.

"We certainly noticed an increased number of referrals from hospital ER physicians and specialists," said Ajay Deshmukh, CEO of KMH, based in Mississauga, Ontario.

As it happened, KMH had been in the final stages of a multi-year process of investing in leading-edge diagnostic imaging and cardiology equipment through its partnership with GE Healthcare. As such, it felt as if they were able to handle the referrals, with patients getting the benefit of the latest technology.

For its part, KMH has recently relocated and rebuilt three new facilities, installed five new nuclear medicine gamma cameras, and upgraded its two MRI scanners. The company also operates a PET/CT scanner, the gold standard for cancer care staging.

Like hospitals, IHF operates under strict regulatory standards and oversights are in place to ensure that Ontario patients get a quality experience. And it would appear as if patients have been pleased with the clinics. During the height of the pandemic, KMH conducted 600 patient satisfaction surveys and received an overall score of 9.6 out of 10 on the satisfaction category and 9.5 when patients were asked whether they would recommend KMH.

"Our amazing staff, team of specialists, and technology work together in an effort to place patients first and help get Ontarians access," said Deshmukh.

This is even more important in these times when access to testing is seen as the #1 health issue for Ontarians – as found in a July 2021 Ontario Medical Association survey of over 4,200 respondents.

"There are only 14 PET/CT scanners in all of Ontario," said Deshmukh. "Only three of them are sited outside of hospitals, one of which is at our KMH Mississauga location."

The company is well-known for the excellence of its cardiac care. Its suite of gamma cameras is superb at detecting problems in blood flow through the heart, using exams known as cardiac perfusion studies. The company also provides cardiac stress tests, echocardiograms, and Holter monitor tests.

Not only has KMH collaborated with GE Healthcare to use up-to-date equipment, but it has also invested in information technology. Platforms such as Hospital Report Manager and the Ocean e-referral system enable doctors to also receive and send in referrals electronically.

The company has invested in virtual care, enabling its physicians to perform many of their duties remotely and share reports. It makes use of GE Healthcare Xeleris for nuclear medicine studies, a GE echo EchoPAC, and an enterprise-level Carestream product for other images.

"After the first few months of the crisis, during which GPs were adapting to virtual, and patients were told not to leave their houses, our volumes of referrals started to increase month over month, and we are now well past pre-pandemic levels," said Deshmukh.

"This year, we'll schedule over 130,000 appointments for Cardiology, MRI, and Oncology. By doing that, KMH is helping 130,000 people make one less visit to hospital systems that are all trying to prioritize and recover themselves."

KMH is forming tighter relationships with hospitals in other areas, too. It recently created a first-of-its-kind partnership with Sunnybrook Health Sciences Centre under which KMH will service the rapid access clinic for Sunnybrook in the area of cardiology.

"For everyday, non-emergency cardiology services, our clinics will become an outlet to the Sunnybrook 'hub,'" said Deshmukh. "We have the infrastructure for this."

That will enable Sunnybrook to focus on more complicated and urgent cases, areas in which it has exceptional expertise. If their patients tested at KMH show signs of needing more comprehensive tests or services, like intervention, they'll go on to appropriate department labs at Sunnybrook.

"We know we can handle the many things that don't absolutely need Sunnybrook's four walls," said Deshmukh. "We've got five clinics in the Greater Toronto Area, most with free parking and transit nearby so the idea is that it increases patient convenience and ease."

The KMH partnership with Sunnybrook is an example of how IHFs are resiliently supporting hospitals during the COVID crisis and into the future. By playing a role in their local communities, urgent or otherwise, IHFs like KMH are allowing hospitals to recover from COVID, helping clear the backlog and wait lists with new facilities and diagnostic services.

App helps Indigenous veterans seeking mental health support

OTTAWA – In a new project launching this fall, Ottawa-based TryCycle Data Systems hopes to change how support and care are delivered to Indigenous veterans with mental health or substance use disorders.

The one-year project, supported by the Saskatchewan First Nations veterans Association (SFNVA), will pilot the TryCycle digital health app as a twice per week assessment tool that promotes self-reflection, mood analysis, and symptom tracking.

"We look forward to working with TryCycle Data and the services they will be offering to our veterans who will have immediate access to mental health support," said SFNVA Grand Chief Steven Ross.

About one-fifth of Canadian veterans are diagnosed with a mental health disorder at some point in their lives – the most common are depression, PTSD, and anxiety disorders.

Sleep quality, trouble focusing, and disinterest in hobbies or relationships are early signs that can easily be overlooked or hiding in plain sight. For individuals with a long history of repeated exposure to trauma, for example an Indigenous veteran who has gone through both the residential school system and a military engagement, an even wider range of symptoms can be present and can escalate quickly with little notice.

"Access to mental healthcare has long been a challenge due to resources and stigma. The challenge is more acute in remote, isolated, and marginalized communities. Similar barriers to care exist in the veteran community in general," said

Major General (Retired) Glynne Hines. "That's where solutions like TryCycle can truly make a difference."

TryCycle's own 'digital compassionate tether' platform establishes a trusted care connection between an Indigenous vet-

> **About one-fifth of Canadian veterans are diagnosed with a mental health disorder at some point in their lives.**

eran and a mental health professional via an easy-to-use app, so they feel less isolated in their mental health difficulties.

Promoting Indigenous-to-Indigenous care, the TryCycle app tethers health providers to clients under their care. The

result is a responsive, time-sensitive "human" intervention, that delivers personalized feedback and promotes early outreach to veterans who may require additional support.

The intent is that the experience of being "connected" through this app can create a bridge to other relationships, increasing a sense of belonging, and providing a safe space for healing and sharing. This pilot project aims to include Indigenous Elders in the process of delivering wellness-based interventions, through teachings, support, and ceremonies to cope with hurt, grief, pain, and loss.

The project will blend Western based approaches with Indigenous healing methodologies, peer to peer support, and guidance from Elders.

Integration of XERO® with Teams enables clinicians and specialists to share images

New solution streamlines communication among radiologists and other providers, improving clinical collaboration

The integration of Agfa HealthCare's XERO® diagnostic imaging viewer with Microsoft Teams allows for easy sharing of images among groups of healthcare professionals. Save time tracking down colleagues in the hospital when a review of images is needed—instead, images can be sent quickly and securely in a way that is already used by many physicians and allied professionals.

Physicians requesting a consult can tag specific members of the channel to review an image. If they fail to respond, the request can be escalated via email and repeated notifications.

Physicians participating in a consult can view the images and communicate with each other using audio, video and chat. Also available is a markup tool allowing clinicians to interact with the images using their cursor and to share the markups in real-time.

The solution can be customized to meet the needs of specific hospitals or clinicians. For example, a COVID button can be added to the navigation bar in the XERO viewer and programmed to transmit images to a 'channel' of predetermined specialists, including pulmonologists and infectious disease experts. Channels can be added for critical care and cardiology specialists, ophthalmology, dermatology, and others.

The XERO/Microsoft Teams app can save valuable time over the course of a week, month or year. Agfa HealthCare estimates that with a time saving of 10 minutes per consult, an average hospital could save 75 days of productive time per year. The app can also be life-saving, if a patient has COVID-19 and needs to be placed in quarantine before infecting someone else.

Installation is via a simple plug-in with no downtime or interruption to viewer use. Following successful implementations in the UK, the companies are now offering the solution to North American customers.

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CHUM digital pathology enabled diagnostics delivery, even with COVID

BY DR. BICH N. NGUYEN

The Centre hospitalier de l'Université de Montréal (CHUM) is proud to be the first pathology service in Canada to have embraced digital pathology (DP) as a routine diagnostic tool. Because this transformation occurred just before the COVID-19 pandemic hit, the hospital has been able to continue providing high-quality pathology diagnoses, assisted by remote work that can be carried out around the clock.

Digital pathology (DP) is an emerging field designed to improve diagnostic management. While the microscope is the central instrument in a pathologist's work, DP represents the future of the profession. For its part, the Centre hospitalier de l'Université de Montréal (CHUM) has been leading a complete digitization of its pathology service in an unprecedented move, in Quebec and in Canada, to transform routine diagnoses.

A combination of factors led the team to take an interest in DP. In 2016, facing growing challenges due to increased workload and complexity of cases, as well as foreseeing that DP had the potential of improving productivity and laboratory workflow, the CHUM initiated a multi-step digital pathology implementation project.

Traditionally, the pathologists analyze tissue samples on glass slides using a microscope to investigate diseases, their cause, their evolution, and their prognosis. In the current personalized medicine era, this also includes the detection of the signature of abnormal genetic changes on tumour cells called biomarkers.

The pathologists' work requires precision and patience. But how do you go from

a traditional practice to virtual microscopy?

To achieve this goal, glass slides must be transformed into whole slide images (WSI) that can be viewed on a computer screen. From 2016 to 2018, the CHUM acquired a digital system, including slide scanners and an Imaging Management System (WSI viewer).

This was connected to the laboratory information system. Pathologists' offices were reorganized by adding powerful computers with better graphic cards, RAM speed and high-resolution screens. Sufficient bandwidth was ensured for smooth access to the image data bank. This preparation phase was completed in 2018, coinciding with the pathology service relocating in its modern laboratory.

Implementation accelerated by the COVID-19 crisis: The first phase (pilot phase) of the DP project, initiated in January 2019, involved three out of 24 CHUM pathologists.

The aims were to validate the technology and scanning protocols, and to evaluate the impact of DP in terms of efficiency and turnaround time. The preliminary results of this pilot phase were presented and awarded funding from the Fonds de soutien à l'innovation en santé et en services sociaux in April 2019.

The second phase consisted of completion of DP implementation at CHUM. As this phase was set to begin, the COVID-19 pandemic was in full swing.

Laboratory activities were reduced or even suspended due to constraints from public health measures. The added value of remote working was further recognized.

As digital pathology was coherent with

the provincial project of telemedicine, a new subsidy was granted by the Quebec Ministry of Health and Social Services allowing for expansion of the CHUM's scanning and storage capacity. As a result, the same level of excellence in patient care and remote teaching was maintained and even enhanced during the pandemic.

Digital pathology paved the way for remote working, which was practically impossible before. Pathologists connect to their office computers remotely on a secure network and consult with their colleagues at any time, day and night, weekdays as weekends.

This improves the precision and quality of critical diagnoses and reduces turnaround time. Accelerated test tracking, case overviews, slide sorting and archiving are simple in a digital environment.

It is much easier to annotate, measure, count and calculate tumour volumes, all important criteria in cancer reporting. These benefits fostered enough enthusiasm to convert even late adopters. During a short period of time, 12 pathologists volunteered to embrace a full digital practice.

Since February 2021, all 24 pathologists' offices have been equipped with DP workstations for the completion of the second phase.

Promising results opening up new avenues: Less known to the public than surgeons or oncologists, the role of pathologists is essential to patient care in many fields. For instance, in cancer cases, final pathology diagnoses including the detection of biomarkers are required to design personalized treatment plans.

In a complete digital environment, all tasks performed by lab clerks, medical technologists and pathologists should be more efficiently executed. As a result, time saving in both patient-care trajectory and length of hospital stay is expected.

By increasing storage capacity to collect more data, new avenues involving artificial intelligence (AI) and deep learning are being considered to facilitate diagnoses.

For instance, the biomarker status in cancer cells is traditionally determined by pathologists. This is a tedious task. Accessibility to digitized images made possible a computerized algorithmic approach for biomarker detection that improves both precision and turnaround time.

Several research projects are ongoing at the CHUM to expand the pool of known biomarkers potentially detectable by AI, or to correlate digital pathology data to other patient data for the discovery of new biomarkers.

In the final and third phase of the project, the plan is to expand DP to the six remaining laboratories of the Optilab-Montreal CHUM hub, so that all medical technologist teams and pathologists can work in a digital environment.

Dr. Bich N. Nguyen is a Professor of Pathology at the University of Montreal and an investigator-researcher at the University of Montreal Hospital Research Centre (CRCHUM). She also leads the pathology service of the Optilab-Montreal CHUM hub. Her Optilab service handles yearly over 1,500,000 slides (50% from the CHUM). Her interest in digital pathology translates in many research projects in the field of AI and its clinical applications.

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Effective virtual care must be easy to use for both clinicians, patients

BY NICHOLAS CHEPESIUK

At the height of the COVID-19 pandemic, healthcare leaders, systems, and organizations were forced to rapidly implement digital healthcare solutions to continue caring for patients. In fact, there was a 154 percent increase in telehealth visits in the U.S. in March 2020 compared to the same time in 2019. For patients seeking virtual mental healthcare, that meant a 32 percent increase in appointment completion during the pandemic, compared to only 6 percent prior to 2020. It's clear that digital healthcare is the expected standard by patients.

Digital healthcare solutions enable patients to receive care when and where they need it most. Think of it as omni-channel care, which means that healthcare can be delivered in-person, through different types of technology or other tools, and is not limited to the binary models of in-person or video conference.

This is especially significant for behavioural and mental healthcare patients. They may find that telehealth helps reduce mental healthcare stigma, allowing them to seek care from a safe and secure place while connecting with providers at any time, especially during crises.

Most telehealth platforms provide some tools that offer asynchronous and synchronous care to support an omni-channel care model. EMRs (Electronic Medical Record), for example, often come with video conferencing and content sharing add-on features. However, these features can be bulky and disjointed even within a single platform, creating operational inefficiencies for providers and administrators.

For providers and businesses, this means time lost and higher costs. Healthcare organizations spend 12 cents of every dollar on administrative tasks. This is 12 cents – roughly equaling $569 billion dollars annually – that could be spent on healthcare.

Luckily, there are now omni-channel care solutions that can streamline the delivery of virtual care and reduce these administrative costs.

All-in-one and patient-facing telehealth solutions, such as OnCall Health, are developed with behavioral healthcare in mind. They have automations to make providers and administrators more efficient, a digital front door so patients can easily find and access healthcare and equip healthcare leaders with program management tools to scale and optimize their business.

Complete telehealth solutions unite the provider and patient experience in one solution, accounting for pre-consult, the virtual experience, and post-consult care so healthcare happens in one place. There's no need for hard to use add-on features that neglect a seamless patient experience. Rather, new patients can access care easily through video, phone, or instant messaging tools, while current patients can easily sign up for continued care with the organization's existing provider network.

OnCall Health's client, Trafalgar Addictions Treatment Centers, developed a successful omni-channel care program that focuses on provider efficiency, patient accessibility, and program growth using one unified solution.

For example, OnCall's billing and payment feature enables Trafalgar to automatically send bills and receipts to patients after every appointment. This means that provider and administrator time that was previously used for follow-up is now used for patient care.

With Trafalgar-branded apps in the app store and online, patients can easily find Trafalgar and sign up for care. Trafalgar has configured the patient scheduling and onboarding process for each program offered, so patients signing up to receive addictions care see a different onboarding process than patients signing up for their alumni program.

Trafalgar has experienced exponential growth with newfound efficiency and an impressive patient experience. Shane Saltzman, CEO of Trafalgar, says "since accessibility is no longer a barrier to care, participation has increased and triple the number of graduates are seeking individual virtual therapy services than in previous years."

Trafalgar has both increased patient accessibility and grown their business with digital healthcare. Shane Saltzman attributes Trafalgar's growth to its ability to manage more programs and personalize care through OnCall.

In fact, "Trafalgar went from having one group a week at each physical location, to actually offering three groups a day, five days a week, virtually." With personalized care, patients feel compelled to continue their healthcare journey with digital tools that make finding and receiving healthcare more convenient and accessible. Trafalgar has experienced 300 percent growth in their digital programs since launch and continues to schedule over 500 virtual appointments every month.

There are many considerations for healthcare organizations looking to champion omni-channel healthcare. In a survey conducted by Ipsos, 44 percent of healthcare providers found that digital care tools save them time with 34 percent confirming a reduction in overhead costs.

Empowering providers and patients with digital tools that make providing and receiving care easy is a no-brainer in omni-channel healthcare. Digital technology is not only the antidote to more accessible and efficient care, but it also eliminates countless pain points that providers encounter every day, leading to satisfied providers and happier patients.

Nicholas Chepesiuk is the founder and CEO of OnCall Health, a telehealth solutions company that provides best-in-class software to healthcare organizations, startups, and clinics to launch and grow their own telemedicine programs. Under his leadership, OnCall Health is growing rapidly and today hosts over one million telemedicine appointments annually through its telehealth solution.

New tools in remote communities deliver COVID-19 care

The ongoing COVID-19 crisis has been particularly challenging for Indigenous peoples and remote communities. Providing equitable access to testing, vaccination and screening services has required health agencies to adopt innovative approaches that can adapt to changing conditions while honouring the needs of local populations.

Integrating 800 hotlines, virtual care and on-demand services as part of healthcare delivery has given local agencies new tools to provide support where and when it's needed.

The importance of localizing the healthcare response is more critical than ever. Since the start of the pandemic, health agencies have partnered with Calian – a Canadian company – to provide healthcare solutions and services that help them adapt and scale.

The Government of Ontario worked with Calian on a plan to administer COVID-19 vaccines in 31 fly-in northern locations to Indigenous community members and residents of First Nations' elder care homes.

Over a period of three months, more than 25,000 people were inoculated without ever having to leave their home communities.

As part of another project, Indigenous Services Canada selected Calian to provide COVID-19 screening and paramedic services for Indigenous communities who required additional support.

Most recently, the Government of Nunavut reached out to Calian to provide telehealth services as part of their longterm pandemic preparedness strategy.

On behalf of the Government of Nunavut, Calian manages a well-defined virtual COVID-19 program as an integral part of the pandemic response across the territory. Calian is an experienced provider of telehealth and virtual care services, with solutions tailored to a customer's unique needs.

In the Government of Nunavut's case, a telehealth system enabled residents to complete COVID-19 screening conveniently and without the need for travel, which can be difficult and increases the risk of contracting COVID-19 during outbreaks.

Sanikiluaq, an Inuit community of 850 residents on the shores of Hudson Bay, can access telehealth services for COVID-19.

Integrating video consultations is another capability that Calian health professionals can use to reach out and connect with a more personalized approach.

"As a Canadian company, Calian is proud to support the Government of Nunavut with a sustainable pandemic response system," said Gordon McDonald, president, Calian Health. "From mobile pop-up COVID-19 vaccine clinics to telehealth and video-enabled virtual care, Calian is counted on to deliver innovative solutions."

Calian could not deliver solutions like these without the help of over 2,400 healthcare professionals across Canada. Their dedication, enthusiasm and expertise has helped grow Calian Health to one of Canada's largest national health services organizations, with the adaptability and responsiveness required to support government agencies through the pandemic.

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AI-powered software for MRI gives a 1.5T scanner the image quality of a 3T machine

Two sites using GE Healthcare's new scanner and software say faster throughput will help with patient waitlists.

BY NORM TOLLINSKY

A GE Healthcare deep learning software product recently installed at Ridge Meadows Hospital in British Columbia's Fraser Valley and the IWK Health Centre in Halifax is being described by radiologists as a "game-changer" for magnetic resonance imaging.

Developed by Dr. Marc Lebel, GE Healthcare's Lead Scientist for Neuro MR at the University of Calgary's Seaman Family MR Research Centre, AIR Recon DL is using deep learning to improve the signal to noise ratio by removing the noise and ringing from MR raw data, thereby improving image quality and reducing scan time.

Ridge Meadows Hospital acquired a GE Healthcare SIGNA Artist 1.5T wide bore MRI scanner in October 2020 and went live with AIR Recon DL in May of this year.

"We worked very closely with GE reps and spent a lot of time with them commissioning our new scanner," recalled Ridge Meadows radiologist Dr. Blake Jamieson. "They took notice of the fact that we were very fastidious about image quality and offered us an opportunity to be an early adopter site."

GE Healthcare released AIR Recon DL in the fourth quarter of 2020 and has deployed it on 3T MRI scanners around the world. Ridge Meadows was the eighth 1.5T site worldwide to pilot the software and the first to deploy it in Canada.

"A 3T magnet alters the signal to noise ratio by increasing the signal," said Dr. Jamieson. "We've altered the signal to noise ratio by decreasing the noise, so to my eyes, the images from our 1.5T machine with deep learning and the images from a 3T machine look very similar.

"This is a very interesting way to go about optimizing the signal to noise ratio without the colossal cost of putting in a bigger magnet."

Equipping the 1.5T scanner with the deep learning algorithm was the equivalent of going from HD to 4K, he added.

Using AIR Recon DL, Ridge Meadows also has the option of acquiring the same diagnostic quality of images as before, but much quicker. This is especially advantageous because of the type of patients referred to a site with a wide bore scanner.

"When you have a wide bore magnet and there are only a few others around you, you become a referral site for patients who are claustrophobic and have trouble holding still, which is important because, if you move, you get motion artifacts, or noise," explained Dr. Jamieson. AIR Recon DL removes the noise from the raw data and eliminates the need to increase the duration of the scan to obtain sufficient signal.

"Being able to shave time off a scan and increase throughput can be really important," said Dr. Jamieson. "We scan from 7 am to 11 pm seven days per week and do 25 or 26 patients per day to serve two fast growing communities. If we can increase the number of patients by three per day, that's an extra 1,000 patients per year we can put through our magnet.

"We haven't quite got there yet because we spent a lot of time comparing our old and new images to make sure we were happy with the result and that nothing was lost as we applied the deep learning algorithm. But we're very happy. Nothing has been lost and the images are much clearer and easier to read."
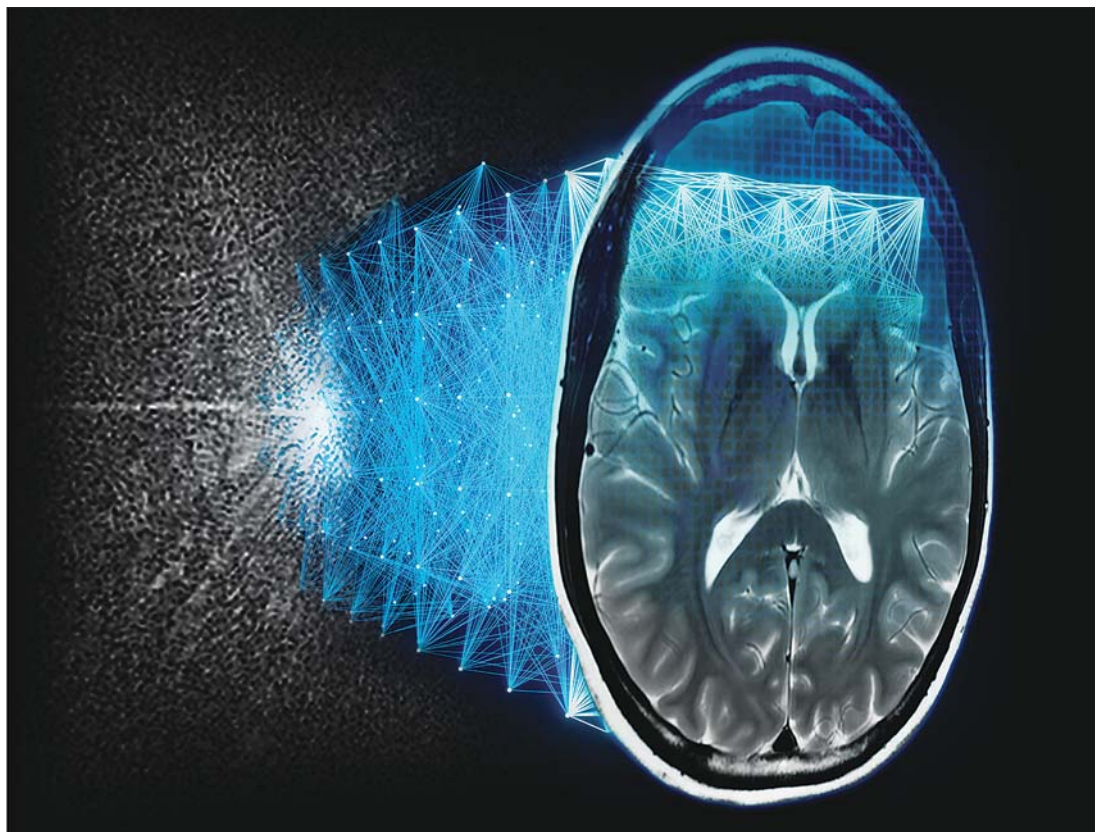
The improved quality of the images is especially important for scans with a small field of view and a high matrix because the smaller the target, the fewer protons there are to create signal. Dr. Jamieson cites the pituitary gland as an example of a scan that would normally be tough to acquire the desired signal to noise ratio.

IWK Health Centre, a pediatric and women's hospital serving the Maritime provinces, acquired and installed a new GE SIGNA Artist 1.5T wide bore MRI scanner in November 2020 and subsequently installed and started to use AIR Recon DL in July 2021.

"We clearly see a huge difference in the quality of our scans and time saved," said IWK Staff Pediatric Neuroradiologist Dr. Naeem Khan. "We are able to acquire high quality images in half the time as compared to scanning without AIR Recon DL, and if we're very keen on quality for fine details in certain special circumstances, we can let the sequence go on longer yet still not longer than the conventional sequence without AIR recon DL and the quality will be substantially better."

Reducing scan time is especially important for

Conventional Reconstruction

Shoulder
Sagittal T2 FatSat
0.5 x 0.6 x 3 mm
2:12 min

New Pioneering
AIR™ Recon DL
Deep-learning base
reconstruction

children, who are unable to hold still for long. It will also boost throughput.

Scanning is available 24/7 at IWK Health Centre: from 7:30 am to 9 pm for scheduled scans and as needed after hours for emergency care. Wait times are currently six months or more for non-emergency patients requiring anesthesia and four to six weeks for all other non-emergency patients, but "If we start doing 40 percent more patients on a daily basis, we can probably eliminate the wait list in a year or two," said Dr. Khan.

Shorter scan times will also reduce the need to administer anesthetic and allow very sick patients to return to intensive care faster than would otherwise be possible.
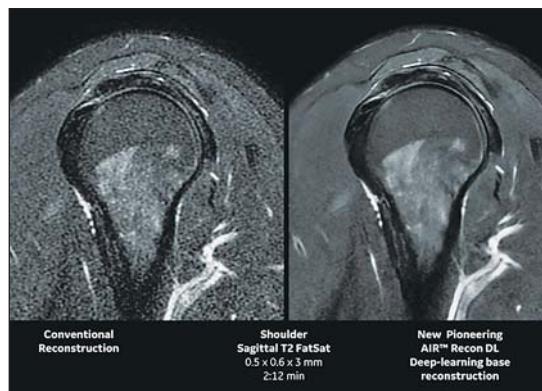
Dr. Khan offered the example of a non-sedated teenager who was very compliant for the first half of the scan and then started moving around. "Because he was compliant for the first 20 minutes, we were able to get 90 percent of the scan done. We gave him a break, took him out of the bore, talked to him for a few minutes then put him back in and carried on for another seven minutes.

"Including the recess in the middle, we did not encroach on the next patient's time slot. That's the kind of situation we're encountering on a daily basis."

Ridge Meadows' MRI supervisor Eve Provencher has learned to take the marketing hype of software vendors with a grain of salt.

"Sometimes," she said, "a company will tell you their product will make everything different, but you try it and it's not true. That wasn't the case with AIR Recon DL. I was really amazed at what AI can do. I think it's going to change the MRI world because we'll be able to scan patients in a shorter period of time and still have high resolution pictures."

AIR Recon DL has already been deployed in sites across Canada with several more installations expected throughout the remainder of the year.

MEDO Lung technology poised to become a major medical disruptor

The thought of using everyday smartphones to scan our bodies for potentially deadly diseases or injuries might seem like something out of a science-fiction movie. It evokes images of the Star Trek tricorder, which was used for this very service by Captain Kirk, Spock and Dr. McCoy.

But the field of medical diagnostics is advancing at a rapid pace, and a start-up company based in Edmonton and Singapore has developed software using artificial intelligence (AI) that will allow us to literally take our health into our own hands. Call it the 21st century stethoscope – that's how MEDO.ai co-founder David Quail refers to it.

The MEDO technology eliminates the need for an expert to perform or analyze ultrasound scans, with the potential to become a monumental disruptor in the healthcare sector. The MEDO ultrasound allows users to peer into the human body and diagnose ailments reliably with the help of AI based on thousands of previous cases. It's inexpensive at $1,500 apiece, non-invasive, and given that it's the size of an electric razor, it fits right in your pocket.

"I took my son to get his ankle X-rayed, and it was eight hours later before we actually had a diagnosis that it wasn't broken," Quail recalled in a recent interview.

And he points to all the more serious situations in which a portable, AI-empowered ultrasound could save lives – including paramedics attending accident scenes and needing to know immediately if anyone injured has fluid on the lungs, internal bleeding or fractures.

Or in ICUs during the pandemic, when the highly infectious nature of COVID-19 has made the traditional way of administering ultrasounds risky, but also critical due to the way the disease attacks the lungs.

The company, in fact, which had already developed portable ultrasounds to diagnose hip and thyroid problems, recently expedited the development of the MEDO Lung in order to help save lives during the COVID-19 pandemic.

With MEDO Lung, a quick scan of the lungs is reviewed by an AI algorithm to automatically detect whether patients have healthy lungs or show signs of the interstitial pneumonitis that leads to most of the severe illnesses and deaths from COVID-19.

The AI algorithm was trained by analyzing thousands of previous scans shared by lung experts at the University of Alberta Hospital, learning the most common indicators for a variety of potential issues in the lung. Scan information is collected, analyzed against previous tests, and indicators are identified. That information is then presented in a way that is obvious to a trained professional, allowing for faster and more accurate diagnosis.

For example, the AI algorithm, thanks to how it has been trained, can detect B-lines in a lung scan suggesting fluid in the lungs or consolidation of fluid in specific regions of the lung. This can then help a trained professional identify pneumonia quickly and accurately.

Looking further ahead, MEDO Lung will scan for other lung diseases including pleural effusions, pneumothorax, pulmonary edema, and is ready to assist in any future pandemics.

"What we do is apply artificial intelligence so that clinicians can acquire a scan and then we assist them in forming a diagnosis, and whether they're dealing with pneumonia, some other lung problem, whether this patient's lungs are getting better or worse," Quail said. "We're able to find the needles in the haystack for the medical professional and present it to them in a way that makes sense."

"It was born of COVID. As soon as the pandemic struck, we thought about what we could do to help and we started looking into how ultrasound is used to detect lung complications and how we could develop something," he said. "Obviously, detecting consolidations of fluid in the lungs is similar to detecting consolidations in a thyroid scan, so there was some technology that we knew we could leverage."

MEDO turned to Amazon Web Services (AWS) to expedite the development of MEDO Lung, leveraging the AWS Diagnostic Development Initiative (DDI). AWS DDI is a US$20 million global program to help bring better diagnostic solutions to market faster. In its first phase, AWS has helped 87 organizations in 17 countries ranging from startups, non-profits, research institutions and businesses.

The program is now expanding into three new areas: early disease detection to identify outbreaks at the individual and community levels, prognoses to better understand disease trajectories, and public health genomics to support viral genome sequencing around the world.

For MEDO, the support from AWS was critical as it worked to launch the MEDO Lung. A university hospital and various lung experts also helped the company develop the product.

"We'd dabbled with pretty much every cloud provider to host our infrastructure," Quail said. "We've got fairly significant requirements and we moved to AWS because of that and because of its elastic nature, the ability to spin out resources to them, instead of having to invest tens of thousands of dollars for machines up front, has been very appealing and quite helpful to us."

With the support of AWS, MEDO was able to get the MEDO Lung up and running with lightning speed.

"It was a pretty quick turnaround, for sure, about a month, and thankfully our prior technology allowed that because it was transferable," he said.

Advanced AWS AI and ML services like Amazon SageMaker, which allows data scientists and developers to prepare, build, train and deploy machine learning models, and Amazon Textract (text and data extraction from a wide range of documents) were instrumental in developing MEDO Lung. Both will play an important part in making a big difference for patients using the solution today and into the future – long after the pandemic subsides.

The future is looking bright for the company, Quail says, and he firmly believes the MEDO Lung will be a game-changer in the diagnostics field.

"I'm 100% convinced that every caregiver, in long-term care homes, in neo-natal clinics, in ICUs, they're all going to have a portable ultrasound machine in their pockets," he says. "It is going to be like the tricorder from Star Trek. People will have them in their home for anything from scanning a newborn's hips to breast exams."

Radiologists request rapid action to reduce wait lists

OTTAWA – In response to the backlog in diagnostic tests that has resulted from the COVID-19 pandemic, the Canadian Association of Radiologists (CAR) is urging the federal government take quick action in three areas to reduce wait lists and improve the health and medical outcomes of Canadians. As noted in the organization's recent report, "Addressing the Medical Imaging Dilemma in Canada: Restoring Timely Access for Patients Post-Pandemic," the federal government is being asked to:

• Invest $1.5 billion over five years in medical imaging equipment and health human resources to support the increased capacity.

• Support the implementation of a national e-referrals program (Clinical Decision Support) to provide referring health professionals with better access to medical imaging guidelines, ensuring that patients receive the right test at the right time.

• Create a National Data Science Institute to harness AI for the strategic prioritization of health human resources, technology, and infrastructure for medical imaging in the wake of the pandemic and beyond.

According to CAR, COVID-19 postponed medical imaging services in every jurisdiction across Canada. While these services resumed to 75% of capacity, in some cases, the current backlog is insurmountable and lower-priority patients will simply not be seen.

Prior to the pandemic, Canadians were waiting an average of 50 to 82 days for CT scans and 89 days for MRI imaging. This is 20 to 52 days longer than the recommended 30-day wait time.

Due to COVID-19, waitlists are even longer, putting Canada in crisis mode for medical imaging. This is especially concerning for individuals needing breast and colorectal cancer screening, patients un-

> **Prior to the pandemic, Canadians were waiting an average of 50 to 82 days for CT scans and 89 days for MRI imaging.**

dergoing cancer treatment, or those who may need imaging but have delayed seeking care due to fears or factors associated with the pandemic.

With nearly large numbers of Canadians now vaccinated, radiology depart-ments across the country are seeing a massive influx of patients attempting to reschedule their appointments. This is on top of the existing need and extremely lengthy wait lists for imaging in Canada.

"Our healthcare system is not equipped to handle these volumes; we are at risk of leaving many patients undiagnosed and treated," the report said.

The Canadian Association of Radiologists (CAR) recommends that the Government invest in medical imaging equipment, health human resources, technology infrastructure, and a national Clinical Decision Support framework to meet the needs of patients whose care has been adversely affected by the pandemic. This will help prepare our healthcare system to address the medical imaging challenges now and in the future.

Fund invests in two emerging diagnostics for colorectal and prostate cancers

TORONTO – Two promising Ontario-based oncology innovations are the latest recipients of early-stage seed capital through FACIT's Prospects Oncology Fund. The breakthrough diagnostic technologies were developed by Dr. Matthew Cecchini and Dr. Subrata Chakrabarti of Western University and Dr. Hon Leong of Sunnybrook Research Institute. Both innovations were previous finalists in FACIT's 2021 Falcons' Fortunes pitch competition.

Dr. Cecchini, Dr. Chakrabarti and their team have invented a bench-top ultrasound-based device that can automate the detection of lymph nodes in resected colorectal cancer tissue, with faster turnaround time and greater accuracy than manual exams by a pathologist.

Dr. Leong has developed a prostate cancer screening kit that can easily be done at home. This innovation has significant potential to increase screening uptake by patients and enable earlier and more accurate detection. Prospects funding will enable preliminary clinical validation studies for both innovations, generating critical evidence to achieve key inflection points along their respective commercialization pathways.

As a unique commercialization venture firm, FACIT leverages its Prospects Oncology Fund to fuel top-tier innovations from Ontario's robust research pipeline. This Ontario First capital is imperative to ad-

> **FACIT is turning every FACIT-invested dollar into 30 dollars of additional investment into the province.**

dressing the seed-stage gap experienced by the province's life sciences sector, helping de-risk innovations and ultimately creating greater value for homegrown intellectual property (IP).

Through both the Prospects Oncology Fund and the Compass Rose Oncology Fund, FACIT has continued to grow its investment portfolio, turning every FACIT-invested dollar into 30 dollars of additional investment into the province.

"Congratulations to Dr. Cecchini, Dr. Chakrabarti and Dr. Leong for these incredible innovations," said Jill Dunlop, Minister of Colleges and Universities. "FACIT has an impressive track record of helping to move oncology innovations to real world opportunities, and their success is reflected in some of the ground-breaking work taking place at our world-class universities and research institutes. The Ontario government is committed to investing in knowledge-based companies that support innovation in cancer research and that bring economic and patient benefits to our province."

FACIT receives support through its strategic partner, the Ontario Institute for Cancer Research (OICR), which is funded by the Government of Ontario.

"The FACIT team is pleased to support these entrepreneurial scientists, providing both capital and commercialization expertise, as they advance their technologies closer to benefiting patients with cancer," said Dr. David O'Neill, president of FACIT. "We look forward to continuing to realize the full value of Ontario IP, attracting private sector investment into the province, and anchoring companies and jobs in Ontario."

FACIT is an award-winning commercialization venture firm that builds companies with entrepreneurs to accelerate oncology innovation, with a portfolio that has attracted more than $1 billion in investment to Ontario. Blending industry experience, capital and the clinician-scientist network of its strategic partner the Ontario Institute for Cancer Research (OICR), FACIT capitalizes on the province's investment in research and healthcare to the benefit of the local economy and patients worldwide. FACIT's commercialization portfolio includes Turnstone Biologics, Fusion Pharmaceuticals, Triphase Accelerator and other biotechnology organizations.

Robotic Process Automation and AI software are a potent combination

RPA and AI in intelligent automation will offer quicker, more effective, and infinitely better healthcare.

BY DR. SUNNY MALHOTRA

The COVID-19 pandemic has exposed new challenges for the healthcare industry. With increasing demands and decreasing supplies, the healthcare system has become overwhelmed and faces deterioration at exponential levels.

Solutions involving automation become top priority concerns for hospitals and other related infrastructures as efficiency is crucial. Robotic Process Automation (RPA) and Artificial Intelligence (AI) serve as two separate technologies that can function together to streamline processes and aid in creating fast and efficient clinical care and further revolutionize healthcare operations.

RPA is preconfigured software that uses business rules to complete processes through an autonomous application or human assistance and intervention. The application of RPA is best suited for mundane, repetitive, and rule-based tasks that do not require human thought contribution and involves inexpensive technology integrations.

RPA can restructure clinical care by automating the process of preloading consent statements, patient pre-registration information forms, insurance eligibility verification, claim filing, accessing payer portals, the release of information requests, and fax-based processes. Automating these tasks can save time, money and free staff to tend to more pressing matters in the administrative setting.

AI comprises the ability to self-learn over time and can apply reason and logic to operational tasks that would otherwise require human judgment and input. AI software can also read and extract appropriate data from various locations.

Where RPA tools deal with structured data, AI can

> **"Intelligent automation" combines RPA tools and AI software to work in coherence to increase productivity and improve patient experiences.**

gather insight from semi-structured or unstructured data in PDFs, webpages, scanned documents, and even text, thereby bridging the gap where RPA tends to fall short. Among other tasks, AI can process referrals, correct human errors, and reduce rejection of these referrals leading to shorter wait times for patients.

Furthermore, AI software can be integrated into existing workflows and can

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learn, process, and perform operational tasks quickly and precisely to cut costs, reduce waiting time, and streamline operations.

"Intelligent automation" combines RPA tools and AI software to work in coherence to increase productivity and improve patient experiences leading to fast, effective, and efficient healthcare. RPA can be integrated into AI technologies, including machine learning, voice recognition, and language processing. AI can convert unstructured data into structured data for RPA to understand and utilize. RPA with AI can then automate more complex processes and work as digital employees, carrying out tasks that would otherwise consume valuable time.

Intelligent automation can work above existing layers of software to identify patients who could benefit from chronic disease screenings, coordinate referrals, and extract relevant data from programs. Programs like these can also screen for value-based care incentive reimbursements to provide better patient-provider care. Incorporating RPA tools with AI can also streamline work across collective human and robotic teams when demand fluctuates, thus allowing for continuous improvement of performance in patient care. Intelligent automation can be scalable to widespread healthcare organizations and providers, offer interoper-

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Island Health team is focused on Corporate Services systems

BY KATHARINE CASEY

Prioritizing corporate systems (human resources, finance, communications, etc.) in a healthcare environment is challenging. When requests for project management systems are submitted to the same queue as requests for clinical systems, the stretched information technology teams cannot help but prioritize the clinical system requests as they directly align to the healthcare mission to improve care.

As a result, the employees supporting the fundamental operations of healthcare use old or end of life systems or, rely on using Microsoft tools or paper-based processes to manage complex corporate functions. Island Health recognized the problem and did something about it. It positioned dedicated corporate systems support within Corporate Services. This approach prioritizes employee needs alongside those of healthcare needs.

The Corporate Business Solutions (CBS) team was formed in February 2018 with the mandate to provide corporate systems support (application development and reporting) to Human Resources, Finance and Support Services and Medical and Academic Affairs, collectively known as Corporate Services.

Its placement within Corporate Services allows the CBS team to learn and understand the business and deliver applicable system solutions.

It also detaches Corporate Services system requests from clinical systems requests so that these requests are not in competition but are running in parallel. To date, the CBS team is achieving more than originally envisioned in three specific areas – governance, portfolio cohesion and enterprise system investment.

To prioritize Corporate Services project requests, the CBS team developed a phased governance model. First, clients were engaged individually to understand longer-term vision and strategy and prioritize the associated projects that supported and aligned to their respective plans.

The CBS team is now transitioning to a cross-portfolio intake model whereby all project requests are ranked and prioritized together. This process ensures that selected projects benefit Corporate Services as a whole, reduce organizational risk, have a higher ROI and are aligned to Island Health's strategic framework.

The governance model is facilitating cohesion amongst Corporate Services portfolios. As the CBS team understands the business, it has identified where requests from multiple portfolios overlap. The CBS team bridges the gap by bringing together groups who have rarely engaged each other in the past, to discuss solutions and the associated upstream and downstream impacts. Silos are breaking down and operations are being approached in a more holistic manner.

As a third benefit, while the CBS team can program and support sys-

Katharine Casey

tems, it knows when it makes sense to purchase solutions off the shelf.

Building on the above benefits, the CBS team evaluated the requests in its queue and realized that an enterprise human resources system has the potential to lessen organizational risk, and reduce waste and opportunity costs.

Island Health's executive leadership endorsed the pursuit of HR systems alongside that of clinical systems as the benefits have been measured and clearly articulated. The organization is now in conversations to invest in Corporate Services systems.

The creation of the CBS team is emphasizing the importance of functioning and sophisticated Corporate Services systems. With the CBS team focusing on improving and supporting systems that support employees, employees can focus on providing their best as clinicians, administrators, housekeepers, food servers, maintenance and beyond in the healthcare system.

Katharine Casey is Director, Corporate Business Solutions at Island Health.

Webinar focused on specialists advancing the use of virtual care

BY KATHY TUDOR

Virtual care adoption has grown rapidly by patients and physicians since the start of COVID-19. To support clinicians in this latest evolution of practice, OntarioMD (OMD) hosted a webinar on 'The Digital Specialist' in July, showcasing virtual care in medical specialty and subspecialty practices.

The complimentary webinar featured panelists Dr. Vandana Ahluwalia, a rheumatologist, and Dr. Mark Boulos, a neurologist. Both are OMD specialist peer leaders and EMR "super users" who mentor fellow clinicians and allied health professionals on the digital capabilities of their EMRs.

They covered a wide range of topics, including secure patient communications, managing and leveraging patient data to improve care, participation in digital health provincial programs, remote patient monitoring, effective consults and tracking and co-management with primary care, teaching specialist residents, and interacting with hospital systems.

"Coming from a family medicine background, I think this webinar really sheds light on how specialists have adjusted to virtual care," said Dr. Chandi Chandrasena, OMD's chief medical officer and moderator for the OMD Educates webinar series.

"The session helps family physicians and primary care clinicians better understand the experience of our specialist colleagues, and specialists also gain insight into how they can improve their workflow using digital health tools," she added. "The OMD Educates series provides these valuable 'behind-the-curtain' opportunities for clinicians to enhance their practices and patient care."

This webinar is part of the OMD Educates: Digital Health and Virtual Care Curriculum 10-part accredited learning series for clinicians, which has had over 1,300 participants thus far.

Dr. Ahluwalia kicked off the July webinar with an overview of EMR use in her field, noting that 93% of community rheumatologists in Ontario are now using an EMR – the highest adoption of any specialty group in the province – as a result of the development of rheumatology tools for patient care.

She highlighted how patient portals have become a valuable channel within EMRs to streamline the paperwork for patients and to securely share information with them. Patient-reported arthritis and health assessment questionnaires, for example, and new patient and follow-up forms, can be pre-filled at home. This information is then attached to the patient's electronic medical record.

"Since the pandemic started, we've been emailing forms to patients, and this has worked out very well," said Dr. Ahluwalia. "Patients can indicate if they've been hospitalized since their last visit, or had any new diagnoses, medications or recent infections. These important questions can be answered in advance of their appointment."

Patients can also receive electronic appointment confirmations for phone and video visits, and COVID-19 screening questionnaires to ensure the safety of office visits. She said this process has decreased the number of incoming calls to confirm appointment times, as well as missed appointments.

She also created a standardized patient intake form that's sent out prior to appointments, enabling individuals to fill in their medical history and medications beforehand. When completed, it is sent to the

Dr. Vandana Ahluwalia

Dr. Chandi Chandrasena

Dr. Mark Boulos

EMR and becomes part of a patient's health record. She then quickly reviews the form during patient encounters and makes corrections or adds missing information as needed.

"My motto is, 'Enter data once, and use it multiple times,'" said Dr. Ahluwalia. "Using digital health platforms and tools that connect with your EMR can create efficiencies that benefit you, your patients and your staff."

Dr. Ahluwalia said that during virtual visits, secure patient messaging can be used to facilitate the delivery of lab requisitions and referral forms to patients. She makes use of the ConnectingOntario ClinicalViewer, a portal that provides access to digital health records such as medications, lab reports and diagnostic imaging, as well as hospital consultations. It also integrates with EMRs to analyze and turn data into insights.

"EMRs can be used to improve point-of-care monitoring, decision-making, quality monitoring, and for research purposes, it's important to standardize data elements that are collected routinely at clinic visits," she said. "This creates a unique opportunity to improve the care delivery and harness EMRs for the development of learning systems."

Dr. Boulos, a neurologist, focused his presentation on how specialists in a hospital setting can optimize the use of an EMR. He explained that within hospitals, clinicians often see very sick patients, and care cannot always be done virtually.

"It really depends on the nature of the issue," said Dr. Boulos. "For sleep consults, such as patients referred for conditions like sleep apnea, this can be done safely virtually most of the time. But a large acute stroke cannot be managed safely virtually."

He discussed key resources that, motivated by the pandemic, have been developed to support virtual care. They include guidelines released by physicians from the University of Toronto Division of Neurology on how to manage patients with conditions like Alzheimer's disease and related dementias, and a paper on conducting a virtual neurological exam, with instructional videos for how to complete a simple sensory screening exam.

He observed that these documents are guidelines, and that exams need to be tailored to each patient.

Dr. Boulos also touched on remote patient monitoring. Using a cloud-based system, sleep apnea patients can monitor their continuous positive airway pressure (CPAP) usage. This information is then fed to the physician, allowing them to adjust the CPAP machine and manage CPAP usage remotely.

For clinicians without this direct connection, CPAP usage reports are still sent through their EMRs, with adjustments made via communication with the CPAP company – such is the case with his practice.

Dr. Boulos discussed the reconciliation features of his EMR that can be used during an online consultation. He can reconcile requisitions, prepare reconciliation reports and identify any unreconciled requisitions directly within his EMR.

This ensures the patient has completed

Virtual healthcare programs are becoming important providers of medical attention

Telemedicine networks are being used as significant tools to support clinicians working in remote regions.

BY DIANNE DANIEL

On the heels of a nationwide acceleration of virtual care sparked by the pandemic, patients and clinicians in rural, remote and Indigenous B.C. communities are finding that accessing healthcare services or peer support can be as easy and comfortable as calling a friend.

"We're breaking down barriers," said Dr. John Pawlovich, a rural family doctor and virtual health lead at the Rural Coordination Centre of B.C. "Clinicians, nurses and doctors new to practice in remote areas are really feeling that comfort in reaching out for help. They're not hesitating, they're not feeling ambivalent … they're actually feeling really comfortable and motivated to call because it's a good experience when they do."

At the same time, community members who haven't sought medical assistance in years are starting to rekindle relationships with healthcare providers over the phone or on Zoom video calls. "They feel listened to and cared for," said Dr. Terri Aldred, medical director of Primary Care at the First Nations Health Authority (FNHA). "They were waiting in limbo and unsure how to navigate the system and suddenly it seems that things are moving really quickly."

Both doctors are referring to the ongoing success of the province's Real-Time Virtual Support (RTVS) initiative, a free service launched in April 2020 to quickly provide healthcare services to rural, remote and Indigenous citizens, and to support the healthcare practitioners serving in their communities at a time when lockdowns were exacerbating existing inequities in care. One year later, the project is fully operationalized and funded as it continues to grow at a significant pace, adding both capacity and programming.

Led by The Virtual Health and Wellness Collaborative for Rural and First Nations B.C., a collaborative that brings together multiple stakeholders including the Rural Coordination Centre, First Nations Health Authority, Provincial Health Services Authority, Providence Health Care, B.C. Emergency Medicine Network and UBC Department of Emergency Medicine, RTVS builds on years of work to bridge the access to care gap in the province. What sets the initiative apart from other attempts to address inequity in healthcare is the foundational belief that the solution must be community led and culturally safe to ensure people feel empowered to make decisions that are right for them, whether they are patients seeking medical attention or clinicians seeking peer support.

"First and foremost, this is a story of people and then it's about how technology can support the communication and the relationships between the people who are involved," said Dr. Pawlovich, noting that the quick rollout of RTVS wouldn't have been possible without the preparatory work of the collaborative.

RTVS currently offers three patient-facing pathways and four peer-to-peer pathways, primarily supported by video or phone calls, and in some cases by mobile apps. On the peer-to-peer side, pathways are designed to support the province's most remote and vulnerable "edge" communities where the only healthcare resource may be a nursing station.

The goal is to respond to requests for help within seconds, answering with a friendly 'How can I help?' as opposed to 'Why are you calling me? I'm busy.'

"What happens in historical interactions is the vulnerable doctor in a remote site reaches out to a larger centre looking for help and often times that person in the larger centre, through no fault of their own, is simply too heavily immersed in what they're doing and can't be all-in on the call," explained Dr. Pawlovich.

In their first year, the peer-to-peer pathways – which provide pediatrics, maternity and newborn, critical care and emergency medicine support 24 hours a day, seven days a week – saw a combined 230 percent increase in calls, with 91 different communities accessing at least one peer-to-peer pathway for support.

The on-demand sessions last anywhere from five minutes to five hours or longer and the pool of roughly

ILLUSTRATION: LINDA WEISS

200 specialists and physicians who staff the service are dedicated to their shifts to ensure a rapid response time.

The medical problems supported range from head injuries, seizures, and fractures to cardiac arrests, COVID-19 intubations and life-threatening issues, to infants with ring worm, inconsolable crying or a foreign body in the ear.

Most sessions occur over Zoom, but the team is starting to advance their understanding of how technology can further improve peer support in remote communities. Some of the leading-edge technologies being explored include smart glasses, point-of-care ultrasound and the ability to run computer simulations for educational purposes.

"Our virtual team wraps itself around these communities to be what they need us to be," said Dr. Pawlovich, noting that all pathways are created and led by people with deep rural knowledge and experience. "It could be helping with transport, managing a patient, or simply settling everybody down and being a friend. It's really that 'call a friend' philosophy that we predicate our RTVS philosophy on and I think that's starting to be transformative."

On the patient-facing side of RTVS, two pathways are being led by the FNHA – the First Nations Virtual Doctor of the Day and First Nations Virtual Substance Use and Psychiatry Service – and a third pathway adds virtual consultations to the province's standard telephone-based 811 nursing services.

Megan Hunt, FNHA acting executive director of Primary Healthcare and eHealth, said the service delivery model for both the Doctor of the Day and Substance Use and Psychiatry programs is based on a "shared care approach" where traditional wellness providers or sacred knowledge keepers work alongside western health and wellness professionals.

Virtual sessions are supported by a single instance electronic medical record so that all practitioners work from the same information, meaning a patient doesn't need to repeat their story multiple times as they move between providers.

Both pathways are designed to be "low barrier," she added. Instead of travelling to a health centre to see a provider on a specific day, for example, community members access services from phone (landline, satellite or smartphone), tablet or laptop from the comfort of home, depending on the level of connectivity available in their community. Referrals for addiction medicine can be made by any provider, not just a primary care physician, and virtual services are offered in a "safe space framework" designed to reach individuals who are struggling with mental health or addiction issues, whose behaviour often causes them to be denied services in the broader health system.

"Rather than saying to patients, 'You're fired from this program,' which happens across the health system all of the time … our safe space framework provides the opportunity for myself and our medical director to reach in and have a conversation with the individual," explained Hunt. "We hear their perspective and see if there's a way to move forward with common understandings and expectations about how we can do that."

The number of people accessing the patient-facing pathways is steadily increasing month over month, and users report a high rate of satisfaction following their virtual encounters. Hunt credits the success to the fact that the delivery model was "developed and operationalized by and with First Nations people" and applies a very specific screening and selection process when enrolling providers.

"We're really looking for practitioners who are curious about learning about themselves, who see it as a mutual relationship, not an ownership relationship, who participate in First Nations culture and participate with community," she said, noting that a significant number of physicians staffing the virtual programs are of Indigenous ancestry.

The First Nations Virtual Doctor of the Day program is staffed from 8:30 to 4:30 every day of the year, including holidays. Four doctors are always available, one for each geographic region, and the goal is to provide same day care.

As one of the providers on the service, Dr. Aldred

sees firsthand the tangible benefit of reaching people who are unattached to care. She said the web-based pathway is easy to set up and use, and that she appreciates the support of medical office assistants, the first to greet and triage patients who call in, and care coordinators, who manage the circle of care for patients, connecting them to community resources as needed.

She believes the upfront work to ensure the right physicians are onboarded to the virtual service, including asking them to provide a statement about what cultural safety means to them and asking them to reflect on privilege, is important.

"I'm Indigenous. I've been involved in cultural safety work and anti-racism work pretty much since the day I walked into med school, and I still learn," she said. "We have the processes that we do because that's what our community asks for. They want to see providers who are kind, who are going to spend time with them, and who genuinely care, so the onus is on us to recruit people who are going to uphold those principles and stand behind them."

Maple Maskawâhtik, a joint venture by telemedicine provider Maple and Saa Dene Group, a collective of Indigenous-owned companies, is another virtual platform working to expand access to essential services where they're needed most across Canada.

"Our goal in forming this venture was to focus on increasing access to rural, remote and Indigenous people across Canada using culturally appropriate care and digital means," said Maple vice-president, Business Development, Christy Prada. Just nine months after launching in December 2020, Maple Maskawâhtik, named after the Cree word for maple, is "heading in the right direction and on the precipice of scaling," she said. The focus to date is on finding government and business partners to help advance the program.

Saa Dene president and founder Jim Boucher, a First Nations chief for more than three decades and Saa Dene CEO Jauvonne Kitto, a former First Nations health director, bring firsthand experience and knowledge of healthcare access issues to the venture. Maple brings the virtual care platform and the expertise to tailor the technology to support community-based models of care.

"It's not about going in and saying, 'Here's the care, take it.' It's about working with those groups to understand their needs, their challenges, and the population health issues that affect them specifically and how they want to solve it," said Prada.

The approach includes training and socializing providers in the Maple Maskawâhtik network to foster cultural sensitivity, as well as broadening provider types available on the platform to include healers, medicine men, sacred knowledge keepers, elders and others, depending on community-specific needs.

Maple Maskawâhtik is currently working with several communities across Canada and is also partnering with leading 5G telecommunications providers to address connectivity concerns in remote areas.

Recently, the venture partnered with the Alberta government to launch an alternative relationship plan (ARP) program, allowing them to offer virtual care on a publicly funded basis to all Albertans.

"Our goal is to grow this ARP with a focus on rural and remote communities and helping patients who are unattached … who don't have a family physician or reliable means of care," said Prada, calling the ARP a critical first step. "The technology will allow us to enhance access in those communities and not only bring access to physicians, but make sure that we're looping in culturally appropriate care."

In her former role as health director, Kitto witnessed healthcare inequity firsthand. Doctor services were only provided a few days per week in her community and when specialty services were required, people had to travel six hours or more.

"I believe that an individual should have a choice of who they wish to see, when they wish to see them and where, and virtual care enables that," said Kitto, noting that Maple Maskawâhtik will offer specialized cultural healing as well. At the same time, she recognizes that the inequity issue is not only affecting Indigenous peoples but all people living in rural and remote Canadian communities.

"Maple Maskawâhtik is a true form of collaboration and continuity of care," she added. "It is Indigenous owned and led, so we understand the culturally appropriate care model, but we also don't want to limit it to one demographic of people."

Saskatchewan tech startup is working to bring healthcare to First Nations

The year 2021 has been a particularly difficult one for First Nations. Indigenous Peoples have not only struggled with the challenges posed by the COVID-19 pandemic, but also the emotional fallout from the grim revelations about Indian Residential Schools.

Accessing quality healthcare has historically been tough for Indigenous Peoples, but the pandemic exacerbated the issue. There's also a growing need for mental healthcare support on First Nations due to trauma about the residential schools discoveries.

That's why Lumeca, a Saskatchewan-based healthcare technology company, is making the needs of Indigenous Peoples a top priority. The startup provides remote access to licensed doctors via audio and video communications for Saskatchewan residents with valid health cards, including those on the Cowessess First Nation, and is making inroads into Manitoba.

Lumeca's founder, Shawn Hazen, also the president and CEO of Haztech, has provided health and safety training and work-site screening and medical services to Indigenous communities. Through these business operations, Hazen developed close personal relationships with Indigenous leaders and stakeholders.

"Cowessess is very progressive, and we saw a clearly defined need that we were able to work together to solve," says Tom Douglass, Lumeca's chief operations officer.

"One of the areas of real need right now is mental health support, in particular. There's a lot of grieving that's going on, a

Shawn Hazen, Founder Lumeca Health (left) and Chief Cadmus Delorme, Cowessess First Nation (right).

lot of emotions coming to the surface because of the unmarked grave sites and the reconciliation that's underway. It's a difficult process and mental health is one of the areas that needs support."

Lumeca is now working closely with Cowessess, about 170 kilometres east of Regina. The First Nation had previously struggled to get physicians to come to the community on a regular basis; often patients were driving several hours just to access basic care.

Cowessess, like so many First Nations, is underserved in terms of resources and internet access. Lumeca built a pod in the Cowessess band office and worked with SaskTel to improve cell reception. It's also ensuring physicians can work closely with psychologists via consent-based medical notes.

Virtual care is extremely well suited to

psychologists and psychiatrists, Douglass notes, since having to physically examine patients isn't necessary, and the consent-based collaboration with physicians is a boon to community members struggling with mental health issues.

Douglass says Lumeca's ultimate goal is to keep patients out of ER and to funnel them to family doctors, since that's the surest path to the best possible health outcomes. The company is also working to increase the number of healthcare providers who can work in Indigenous communities, including specialists, and to get more practitioners on the Lumeca platform.

Throughout these efforts, Lumeca has leaned heavily on Amazon Web Services (AWS), which hosts all of Lumeca's data in Canada, to help bring vital health services to those who need them most.

"It's been fantastic," says Douglass. "Using AWS has allowed us to operate in a very scalable manner with significantly reduced costs, which is very valuable for a startup."

The company credits a range of AWS services for helping them solve challenges while scaling with significantly reduced costs and increased security, particularly:

• Amazon Simple Queue Service (SQS) for sending audit logs, which has reduced the burden on Lumeca's database and allowed it to grow. A single user SQS session can create hundreds of logs and eliminates the required write operations.

• Amazon DynamoDB, Amazon EventBridge and AWS Lambda functions also ended Lumeca's dependence on its database for scheduled events. Now it can seamlessly schedule events without incurring read/write operations on its primary database.

• AWS's CodePipeline helped Lumeca automate its testing procedures.

• Amazon CloudFront, Amazon GuardDuty, Amazon CloudWatch for enhanced securities including firewall rules, DDoS protection, and threat detection.

Douglass says one of the most popular features of the Lumeca app has been its "dependent" system, a huge benefit to aging patients who may not have smartphones and will never get them. Adult children or primary care-givers can log on to the Lumeca platform with their elderly parents for virtual appointments with physicians, and even help explain the doctor's instructions if they're hard of hearing.

"It's been one of the biggest rave reviews for us," Douglass says.

Supporting frontline workers' mental health with technology

BY DR. DIANE MCINTOSH

Health professionals have shown tremendous courage and strength throughout the COVID-19 pandemic, caring for Canadians during a critical period. But it has taken a toll: more than a year of uncertainty and grief has left many frontline workers feeling a high level of stress and burnout. According to Statistics Canada, seven in 10 healthcare workers say their mental health has worsened during the pandemic.

As a result, many essential workers are choosing to step back to protect their physical and mental health. Another Statistics Canada report revealed that there were 36,400 job vacancies in the healthcare and social assistance sector in the fourth quarter of 2020, an increase of 56.9 percent compared to the same period in 2019.

Having fewer workers in an already under-resourced sector will undoubtedly impact the health of Canadians, so it's important to prioritize the health workforce's mental health, especially among frontline workers who have worked tirelessly to keep Canadians safe and healthy at a time when it was needed most.

Talking about mental health is an important first step. But we need to go fur-

ther, taking concrete steps to address mental health concerns. That's why TELUS Health has embarked on a quest to support the mental health of all Canadians, including frontline workers and other health professionals.

"We know COVID-19 isn't just a biological entity," said Dr. Dominik Nowak, Chair of the TELUS Medical Advisory Council. "It is a social, economic, and political entity, with direct and indirect impacts on us all."

So, what steps can be taken to care for those who care for others?

First and foremost, mental health services and resources need to be readily available to frontline workers. Espri by TELUS Health, a mobile app that helps organizations provide mental health support to employees, is one such resource. It offers occupation-specific content focused on mental wellness topics, goal-setting tools for promoting healthy habits, a group video feature for counselling sessions, access to peer support and other organization-specific resources, and one-touch access to crisis support.

"Health professionals, essential workers, and people that have been at this for the last year and a half are already highly resilient – you have to be in any of these fields – but resilience alone is not

enough, especially with the unprecedented pressure healthcare workers have faced," said Dr. Nowak. "The resilience conversation puts the onus on the individual to bounce back. In reality, there's a shared responsibility between health administrators, employers and organizations like ours that are involved in healthcare to support care teams."

One way employers can do this is by implementing policies that let healthcare workers know their mental wellbeing is a

> **Many essential workers are choosing to step back to protect their physical and mental health.**

priority. "This can start at a basic level," said Dr. Nowak. "Ensure people feel encouraged to take time off, create a schedule for coverage so people know their patients and community are being cared for when they're away, and ensure mental health services and peer support are available." For example, the Institute for Healthcare Improvement (IHI) recently introduced the concept of "Psychological PPE" as a set of guidelines for improving healthcare staff's mental wellbeing.

Embracing technologies that decrease administrative burden can also help. The new Collaborative Health Record, for example, is an all-in-one cloud-based solution that reimagines the electronic medical record, allowing patients to play a more active role in their health, seamlessly communicate with care teams, and contribute to their health records. "These kinds of interventions work hard on the tech and administration side so we, as clinicians, can focus on providing care," said Dr. Nowak.

As healthcare professionals and other essential workers continue to contend with the COVID-19 pandemic, it's important to ensure that tools and resources are in place to support their mental health and wellbeing. Being aware of virtual care's potential to contribute to the health system's sustainability, the federal government is investing $150 million in virtual solutions over the next two years.

TELUS Health is a proud partner of the Canada Health Infoway Alliance and looks forward to contributing to its innovative efforts to transform healthcare and empower Canadians to live their healthiest lives, physically and mentally.

Dr. Diane McIntosh is the Chief Neuroscience Officer at TELUS.

Virtual care in post-pandemic Canada: Insights from CMA's survey

BY DR. ANN COLLINS
AND MICHAEL GREEN

Almost all Canadian physicians say they will continue to use virtual care after the pandemic, and 64 percent say they will maintain or increase their use, according to a recent survey conducted for Canada Health Infoway (Infoway) and the Canadian Medical Association (CMA). This is great news, and it's surely a strong indicator that virtual care is here to stay, at least as a complement to in-person care for most routine health visits.

Survey findings: There are a number of other encouraging findings from the 2021 National Survey of Canadian Physicians, which was conducted online in April and May with more than 2,000 physicians – general practitioners (GPs)/family physicians, specialists and residents:

• 94 percent said they currently use virtual care, with 93 percent offering telephone visits, 51 percent offering video visits, 36 percent offering email/messaging and five percent offering remote patient/home health monitoring;

• 84 percent believe that virtual care improves patient access;

• More than 70 percent believe virtual care enables quality care and efficient care for their patients;

• Seven out of 10 were satisfied with telephone/video and about 50 percent were satisfied with email/messaging and remote monitoring;

• More than 70 percent said they have the knowledge and skills needed to use virtual care, are satisfied with time spent with patients, and found it easy to integrate into their workflow; and

• 93 percent of GPs are now using electronic medical records (EMRs), up from 86 percent in the 2019 Commonwealth Fund Survey of Primary Care Physicians.

You can explore the data in-depth at the Infoway Insights research website.

The shift to virtual care: As we know, Canadian physicians and patients turned to virtual care out of necessity when the COVID-19 pandemic began in early 2020. There was an urgent need to keep patients and physicians safe by keeping patients out of crowded waiting rooms where they could potentially contract or spread the virus. So most routine visits were conducted virtually – by telephone, video, email and messaging.

Patients and physicians adapted quickly, or tried to, and the provinces and territories put temporary fee codes in place to ensure that physicians were compensated for virtual care. Within weeks of the onset of the pandemic, virtual care made up about 60 percent of patient-reported visits.

The recent physicians' survey and Infoway surveys with Canadians show that about half of all visits with physicians are currently virtual, an understandable decline since some COVID-19 restrictions have been lifted and it has become safer to conduct in-person visits. The surveys of Canadians also show that patient satisfaction with virtual care is very high – consistently around 90 percent. And more than 75 percent of Canadians feel that virtual care saves them time and money and

Dr. Ann Collins

Michael Green

enables them to receive treatment more quickly.

Ensuring equitable access to care: With high satisfaction rates among physicians and patients, and the willingness of both groups to use virtual care post-pandemic, we have a real opportunity to integrate virtual care into our health system. However, we still need to do a lot of work to ensure quality care and equitable access.

We need to create national licensure for physicians, develop quality standards, address interoperability, and improve digital health literacy, education and training. These are crucial elements to the successful integration of virtual care into our health system and should be part of our post-pandemic roadmap.

Physicians raised concerns about patients who may need additional support to access virtual care, including those with low levels of technology literacy, disabili-

ties, language barriers, low incomes, chronic conditions, and those who are from remote locations and Indigenous communities. This goes to the heart of equitable access to care.

These vulnerable populations were experiencing challenges with the health system pre-pandemic, including things like taking time off work for appointments, finding childcare or having to travel a great distance to see a doctor.

Overcoming barriers: We need to ensure that virtual care closes the gap instead of exacerbating these disparities. For example, the lack of broadband internet access in many rural parts of Canada continues to be a challenge for patients and physicians. We also know that targeted applications of virtual care can alleviate some access barriers, like distance, language and social anxiety, so we need to collaborate with national and jurisdictional partners to address these underlying equity-related barriers.

Technology has also been a challenge for physicians and patients, making the transition to virtual care less than seamless in some cases. We've all experienced these issues in virtual meetings – asking people to unmute themselves while on a video

Virtual care: Accelerating progress beyond the pandemic

More than ever before, Canadians are aware of the value of virtual care as many virtual programs and projects have been deployed rapidly across the country over the past year. The latest Canada Health Infoway surveys show that since the beginning of 2021, 57 percent of patient-reported visits with family doctors have been virtual and there has been rapid proliferation of virtual care services and tools across care settings in all jurisdictions.

Now, it is critical that organizations and jurisdictions work together to leverage each other's learnings to enhance the quality and long-term success of effective virtual care services in concert with the return to physical care de-

livery. Balance is a key ingredient in a hybrid environment. As are rapid sharing of learnings within a standardized, structured maturity model to advance virtual care in Canada and deliver criti-

> **Since the beginning of 2021, 57 percent of patient-reported visits with family doctors have been virtual.**

cal insights to drive future strategic planning and investment.

Many jurisdictions and organizations are now building strategies and shoring up foundational digital health supports for virtual care across Canada. The fed-

eral government's bilateral agreement with jurisdictions across Canada for investment in virtual care initiatives has been a key enabler for this work, as has Canada Health Infoway investment through follow-on support funding for digital health and virtual care in all provinces and territories, as well as Rapid Response Investment in 17 projects across all jurisdictions.

Across Canada, CHIEF Executive Forum members recognized the challenges and opportunities that exist across all jurisdictions as a result of accelerated adoption and deployment of virtual care services due to COVID-19.
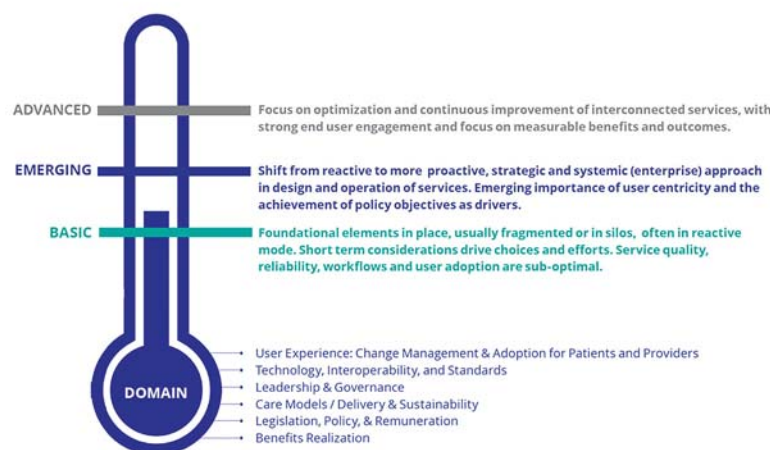
In response, a National Virtual Care Working Group was launched in 2020 to create a set of national tools and resources to accelerate virtual care progress and maintain the gains, continue progress, and speed up time-to-value.

Digital Health Canada's CHIEF Executive Forum Virtual Care Working Group was formed in 2020 to develop and introduce a standards-based approach to enabling and accelerating the implementation of virtual care across Canada.

Canada's Health Informatics Executive Forum (CHIEF) is an interactive, trusted environment for senior professionals and leaders in digital health and healthcare. CHIEF is Canada's largest collaborative group of public-private sector digital health leaders that collaborate to identify and exchange best practices, address professional development needs, and offer their expertise to government and system stakeholders in setting the agenda for the effective use of

Maturity Model Level Definitions

ADVANCED — Focus on optimization and continuous improvement of interconnected services, with strong end user engagement and focus on measurable benefits and outcomes.

EMERGING — Shift from reactive to more proactive, strategic and systemic (enterprise) approach in design and operation of services. Emerging importance of user centricity and the achievement of policy objectives as drivers.

BASIC — Foundational elements in place, usually fragmented or in silos, often in reactive mode. Short term considerations drive choices and efforts. Service quality, reliability, workflows and user adoption are sub-optimal.

DOMAIN
- User Experience: Change Management & Adoption for Patients and Providers
- Technology, Interoperability, and Standards
- Leadership & Governance
- Care Models / Delivery & Sustainability
- Legislation, Policy, & Remuneration
- Benefits Realization

Canada's healthcare system scores second last out of eleven countries

could take your knee out and put in a titanium and plastic one, but if you're 300 pounds, the best thing for you to do would be to lose 100 pounds. But surgeons don't get paid for you to exercise and lose 100 pounds."

"In Canada's primary care model, we prescribe medication for patients with high blood pressure, but we don't do a very good job making sure they take it, following up in a timely manner, making sure their blood pressure is controlled, managing side effects and being available to answer questions," said Dr. Woods.

Dr. Keshavjee cites the example of a patient on dialysis who is costing the healthcare system $100,000 a year. "This patient's kidneys didn't miraculously fail overnight," he said. "It happened over a decade. We need to pay more attention to these patients upfront."

In some countries, a diabetic who hasn't had his feet checked in six months will get a knock on his door from someone asking, 'Can I have a look at your feet, sir?'" We don't do that in Canada.

Investments in social services can reduce pressure on the healthcare system, but as president and CEO of London Health Sciences Centre, Dr. Woods had zero flexibility in allocating dollars to worthy programs in the community.

"The way healthcare is organized in Ontario is so antiquated because it's by entity instead of by population. I had no breathing room to invest outside my sphere. In downtown London, for example, there's a program called Youth Opportunities Unlimited serving homeless youth and teenage mothers. I would have loved to put a half million dollars into that, but I had no room for it. With ade-quate support, those kids would be less likely to show up in ER and admitted to hospital."

Canada ranked fourth in the Commonwealth Fund's care process domain, which encompasses screening and vaccinations, medical errors, care planning that reflects patient preferences, and IT-enabled information sharing for co-ordinated care. The report doesn't reveal

> **In some countries, a diabetic who hasn't had his feet checked in six months will get a knock on his door.**

Canada's ranking in the latter sub-category, but Dr. Woods claims there is room for considerable improvement.

"Canada has no discernable health technology strategy. We have a lot of small "s" strategies and jurisdictional squabbles with Canada Health Infoway, Ontario MD and others all fighting for funding. That's not a health IT strategy. If it were up to me, I'd take all that funding, thank everybody for their time and start from scratch.

"When you have self-contained systems, you have to start creating ways for them to talk to each other, but they don't and it's expensive."

Government should require electronic health record vendors to be able to "API data into a health information exchange," he urged.

An ideal health IT system should allow us to find out how many diabetics living in Oxford County accessed care or how many patients in Middlesex County have their blood pressure controlled, said Dr. Woods. "That's entry-level stuff. That's something we should be able to do. We can't generate standardized reports to cohort patients by disorder, by multiple disorders, by postal code, by census tract, or by ethnicity."

With a health information exchange, effective data governance and interoperability, healthcare professionals would be better able to share information and proactively address healthcare issues.

Dr. Keshavjee, who has a special interest in enterprise healthcare architecture, agrees that excellent technology and data are necessary for identifying high-risk patients, but questions the efficacy of health information exchanges. "Canada Health Infoway recommended health information exchanges back in 2003, but it didn't work," he remarked.

It turns out that it doesn't matter if a family doctor gets a discharge summary in two days, instead of two hours because the likelihood of a patient being readmitted to hospital in that period of time is very remote, "so what problem are we solving by spending all that money on exchanging this data?" he asks.

The Commonwealth Fund report concludes that the top-performing countries provide universal coverage to remove cost barriers. They invest in primary care models to ensure high-value services are equitably available. They reduce administrative burdens and they invest in social services that increase equitable access to nutrition, education, child care, housing and transportation.

Does Canada need to spend more than the 10.8 percent of GDP it currently spends on healthcare?

Perhaps, but not necessarily, according to Dr. Woods. Norway, the United Kingdom, the Netherlands, Australia and New Zealand all spend less than Canada as a percentage of GDP, while the U.S., which ranked 11th, spends a whopping 16.8 percent of GDP despite being the only country in the study lacking universal healthcare.

"Maybe we do need to spend more, but we definitely need to spend it differently," he said.

Robotic Process Automation and AI software potent combo

ability between systems to create an efficient and effective transfer of patient health information.

The allocation of RPA to handle more complex processes with the aid of AI will make the front and back-office clinical workflows more efficient, cost-saving and redirect attention to where it matters most, frontline care.

Automation tools can extend beyond clinical care settings and can be used as resources to ensure positive patient care experiences and health outcomes. "Connected care" is an interoperable platform designed to integrate patient care through the connection of multi-disciplinary teams and technologies involved in a patient's health and well-being. It is personalized to each patient's individual needs and goals.

Connected care can provide accurate and complete patient information through a centralized location for all patient information, such as electronic health record systems. Sensing AI technologies allow for continuous monitoring to capture information about patient status during treatments and recovery.

Intelligent automation can also employ predictive analytic data that can be used to detect deterioration before complications occur and create alerts to address patient needs in real time quickly. The technologies in connected care can provide communication means between healthcare teams inside and outside of the hospital, ensuring a continuity of care throughout.

Intelligence automation can also screen patients for chronic diseases, mental well-being, and social health, providing valuable information for preventative healthcare. RPA tools with AI can coordinate multiple care plans from specialists, nurses, or other providers, provide remote monitoring, allow patients to schedule appointments, and receive appointment reminders.

Automation of simple tasks and processes saves administrative staff and providers more time to focus on patient needs and will reduce physician burnout.

Connected care offers the convenience of healthcare at home or the workplace by allowing patients access to their health information through integrated patient portals easily accessible from phones, tablets, and wearables.

Connected care makes it easier for patients to interact with their providers and can create better relationships between

> **Automation tools can extend beyond clinical care settings and used to ensure positive patient care experiences.**

providers and patients through coordinated automation that gives them "to-do's" while ensuring collaboration on patient progress.

This type of care allows for a better understanding of their overall health needs and the necessary steps in preventative care. Access to this health information gives patients the power to participate in the management of their health-related outcomes and creates positive patient experiences.

RPA tools and AI software have been proven to reduce costs, improve productivity, improve access while maintaining the quality of care. Automation tools are critical in the development of efficient healthcare operations amidst the ongoing pandemic and will continue to be moving forward. Continuous development of RPA and AI in intelligent automation will offer patients, communities, and providers even quicker, more effective, and infinitely better healthcare systems to come.

OntarioMD webinar

all tests that were ordered, and that he can keep track of results, consultations and tests ordered, and follow up as necessary. There is also a wait list function to keep track of wait times, especially useful for hospital-funded clinics.

He said that a big challenge working in an academic setting is how to integrate residents and fellows into the workflow virtually. Conducting consultations by phone is easiest, but often the least effective.

"Using the phone is not always the best way of doing it," said Dr. Boulos. "But for patients with limited technology and during the height of the pandemic, that's what was being done."

He emphasized that virtual tools like those from the Ontario Telemedicine Network (OTN) and Zoom for medical care are useful alternatives, and outlined the process for their successful implementation at Sunnybrook Health Sciences Centre, where his practice is located.

Dr. Boulos wrapped up his session by giving an overview of how to integrate an EMR with a hospital-based system, again drawing on a real-life example at Sunnybrook. He described how registration information, clinic notes, and imaging and lab information are shared between the systems.

He further noted that this process takes work, fees, and a lot of coordination, but rather than "working in a bubble," this level of integration ultimately raises the quality of patient care.

The OMD Educates: Digital Health and Virtual Care Curriculum offers new, free sessions every month, and complements the annual OMD Digital Health and Virtual Care Day Conference that recently took place on September 30. Clinicians can register for

> **A big challenge working in an academic setting is how to integrate residents and fellows into the workflow virtually.**

these live webinars and access all previous recordings online at ontariomd.ca/about-us/events/omd-educates. For help with EMRs, and other digital or virtual care tools, OMD staff are available at your convenience by contacting support@ontariomd.com.

Kathy Tudor is director, Communications and Marketing, at OntarioMD.

Virtual care for Canadians: Accelerating progress beyond the pandemic

digital to improve health and healthcare in Canada.

The Working Group members (a list of which can be found at Working Groups at digitalhealthcanada.com) recognized that recent accelerated adoption and deployment of virtual care services has created new challenges and opportunities across all jurisdictions:

• Lack of common lexicon to describe virtual care services across Canada;

• Gaps in standardized approaches to deployment of virtual care and continued re-learning of the same lessons across jurisdictions;

• Workflow challenges for clinical, operations, and technical professionals, and patients and caregivers; and

• Few tools available to assist professionals and patients with information, skills, and education related to use of virtual care services.

In response, the Working Group has created two practical Canadian resources: a national, virtual care maturity model that will enable organizations, jurisdictions, and institutions to identify where they find themselves on the virtual health journey and what steps they need to take to improve their performance; and an associated virtual care lexicon to provide a foundational, common language for virtual care planning across and between jurisdictions and sectors.

Together, this set of expert-created resources are designed to create alignment, direction, and decision-support in virtual care across the country. They support sustainable virtual care program development and give jurisdictions a roadmap to assist with budgeting, and the tools and the data they capture will provide guidance on lessons learned from organizations who have already done the work. This is critical for maximizing investment impact and time-to-value as well as creating capacity in the current limited-resource environment across Canada.

The Working Group is committed to providing these resources as foundational elements for virtual care strategy and planning activity across Canada at the national, jurisdictional, and health system level.

These resources will help leaders create alignment, direction, and decision-support in virtual care across the country and assist in creating capacity in the current limited-resource environment.

Digital Health Canada is working with organizations that are engaged in strategic planning and/or accelerating their virtual care journey. Please reach out with questions or feedback at communications@digitalhealthcanada.com.

Insights from survey

call, or having video or audio cut in and out.

Understandably, physicians don't have time to be "help desk support" for patients, so Infoway is developing programs to address digital health literacy and clinician change management. We also expect physicians' integration of virtual care into their practices to be similar to their adoption of EMRs. They will need to revisit their practice and workflow to sustain and optimize the use of virtual care, especially video and messaging.

The future of virtual care: So, what does the future of virtual care in Canada look like? We believe it's a future where virtual care is fully integrated into our health system and we don't even talk about virtual care or in-person care.

We will have a health system that is truly patient-centred, enabling patients to receive care using the right modality of care, at the right time to ensure appropriate, quality care. Continuity of care and collaboration among healthcare providers will be optimized, and Canadians will have better health outcomes. Infoway and the CMA are committed to collaborating with governments and other health system stakeholders, including patients, to make this future a reality.

Dr. Ann Collins is Past President of the Canadian Medical Association, and Michael Green is President and CEO of Canada Health Infoway.

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