



CANADIAN

TWENTY-FIVE YEARS

# Healthcare Technology

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PHOTO: COURTESY CANADIAN MEDICAL ASSOCIATION

## Healthcare system must prepare quickly for virtual visits

A virtual-care task force is urging policy makers, health professionals and patients to collaborate on speeding up the adoption of virtual visits. The suggestions were timely, coming just as the COVID-19 crisis struck Canada. Pictured in Ottawa at the announcement of the recommendations are Dr. Yanick Beaulieu, Dr. Ed Brown, patient advocate Julie Drury, and CMA past-president Dr. Gigi Osler. **SEE STORY ON PAGE 4.**

## AI improves diagnostic imaging at Canadian hospitals

BY NORM TOLLINSKY

There is increasing evidence that artificial intelligence (AI) is poised to make a major impact on the practice of medicine in Canada.

GE Healthcare's Critical Care Suite, for example, an AI application that identifies cases of pneumothorax on X-ray images in real-time, was approved by the U.S. Food and Drug Administration (FDA) in September and is in the queue for approval by Health Canada.

"Normally, X-ray cases are read on a first in, first out basis and if a patient is number 50 on the list and there's a critical pneumothorax, the radiologist may not get to it right away," explained Daniel Zikovitz, principal solutions architect with GE Healthcare Canada. "With Critical Care Suite, the exam is automatically pushed to the top of the workflow queue."

Artificial intelligence is pervasive in other industries and works behind the scenes when we browse the Internet, shop online

and use our smartphones, but its deployment in healthcare has been challenging.

Training an algorithm to identify a pneumothorax, for example, requires that it be exposed to a large volume of chest X-rays from multiple hospitals, which hasn't been easy given the siloed nature of their storage, privacy concerns and regulatory controls.

The development of Critical Care Suite and the pneumothorax algorithm was made

**Humber River Hospital in Toronto helped develop an AI system that detects pneumothorax in X-rays.**

possible by the launch of GE Healthcare's Edison platform in November 2018. Edison allows seamless uploading and sharing of images from partnering hospitals and provides a common Web-based workspace on which radiologists from different organizations can curate and annotate the images, an essential prerequisite to training an algorithm.

Humber River Hospital in Toronto, one of four institutions to sign a data sharing agreement for the development of Critical Care Suite, provided 156,000 privacy-compliant chest X-rays and associated reports to GE Healthcare. Two U.S. institutions and one in India also partnered on the project.

"Using natural language processing, GE was able to go through thousands and thousands of reports and sort out the ones that had the word pneumothorax in them," said Marina MacPherson, senior PACS analyst at Humber River Hospital. "Once curated, the algorithm then had to learn what a pneumothorax looks like, so radiologists were contracted to go through the images and electronically outline the pneumothorax."

"Eventually, we expect GE to move on to develop algorithms to identify other pathologies, including pneumonia and pleural effusion."

Currently, Critical Care Suite works on GE's Optima XR240amx portable X-ray ma-

CONTINUED ON PAGE 2



# AI improves DI at Canadian hospitals, with more innovations coming

CONTINUED FROM PAGE 1

chine, but it will eventually also be available for deployment on the company's fixed devices.

At the McGill University Health Centre's (MUHC) Augmented Intelligence and Precision Health Laboratory (AIPHL) in Montreal, Dr. Reza Forghani and his team are using GE's Edison platform and machine learning technology to predict the spread of head and neck squamous cell carcinoma to the cervical lymph nodes.

"CT imaging doesn't pick up some types of early spread well, so a lot of head and neck cancer patients get their lymph nodes taken out," explained Dr. Forghani, associate professor, Department of Radiology, MUHC, and director and lead investigator, AIPHL. There's a value to that because of the survival benefit, he said, but it results in overtreatment and an unnecessary invasive procedure with potential for significant complications and morbidity for as many as 60 to 70 per cent of patients.

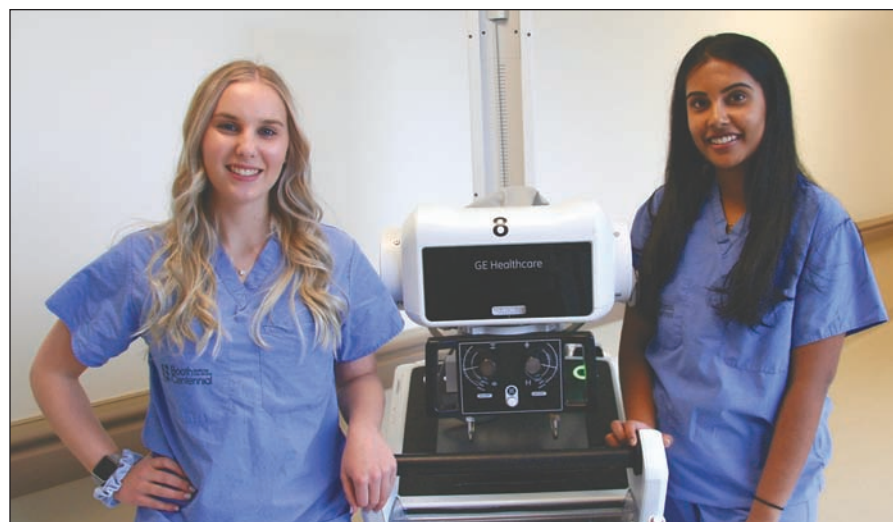
"If validated in larger studies, this approach could be combined with a radiologist's expert evaluation of nodes as a clinical

assistant tool, potentially increasing diagnostic confidence in prediction of absent nodal metastases and reducing negative neck dissections," concludes a research paper published in *European Radiology*.

McGill University Health Centre's Augmented Intelligence and Precision Health Laboratory is beta testing GE's Edison platform and operates a "very broad AI program that includes everything from precision medicine to streamlining processes," said Dr. Forghani. Edison allows his team to work collaboratively with other institutions around the world and add to its capabilities.

"Images are great but there are a lot of other things in a patient's chart, including waveforms, ECGs and molecular phenotypes," he noted. "For example, there's a lot of interest in liquid biopsies. People have tumours, they shed dead cells and, therefore, DNA. In the future we could combine the molecular information and the information from the scan to help us make predictions."

"These are complex problems," he added. "They're feasible, but it will take years until they're developed and validated. In the meantime, there's much



Humber River Hospital radiology technologists Victoria Wagg, left, and Laxcika Satkunalingam with a GE Healthcare AI-enabled Optima XR240amx portable X-ray machine; the system incorporates AI.

lower hanging fruit to optimize workflow because, let's be honest, there are limited resources and medicine costs too much, so we need to be more efficient and demonstrate some wins in the short term.

"More and more things are done with

imaging, which is fine, but someone has to read those images and how we deal with volume is an issue."

One example of a workflow tool is GE Healthcare's AIRx solution for magnetic resonance brain scans, which uses artificial intelligence to set the angle and thickness of the slice, as well as the energy level.

Manually setting the protocol for a head and neck scan could take 45 minutes, said GE's Daniel Zikovitz. "The autoprotocol on our AIRx can do it in 15 minutes or less. That saves time, but what's even more important is that it avoids variance. If you're doing a head scan and you're measuring a brain tumour and you've given the patient some sort of treatment – it could be radiotherapy or a drug – you want to determine within a fairly tight margin if the tumour is growing or contracting."

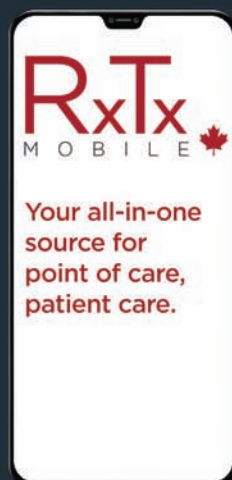
If the scans are performed using different protocols, determining the growth or contraction of the tumour is more difficult.

Another Edison-powered example of low-hanging fruit is GE's XQA tool, which Humber River uses to track and report on X-ray reject rates. The reports produced by XQA identify the type of exam, the technologist and the reason for the reject, empowering the department's Quality Assurance team to take corrective action based on non-punitive principles of practice awareness and education.

"Our reject rate was originally upwards of 8 percent. The last time we looked, we're consistently trending below 5 percent, creating greater efficiency and reducing patient radiation dose," said Dolores Dimitropoulos, manager of Humber River's Medical Imaging Department.

AI is here and it's exciting," said MacPherson. "It's going to change medicine, but in particular, it will change medical imaging."

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# Medical associations working to spur use of virtual care in Canada

BY JERRY ZEIDENBERG

**O**TTAWA — The sluggish growth of virtual care in Canada hasn't been caused by a lack of technology — there are plenty of solutions available, all of them capable of connecting clinicians with patients via smartphones and computers.

Instead, we can blame the unsolved “human” problems of licensing and paying physicians for virtual visits, training them and allowing them to share patient information.

Those were the conclusions of Virtual Care Task Force, jointly conducted by the Canadian Medical Association, the Royal College of Physicians and Surgeons of Canada and the College of Family Physicians of Canada. (<https://www.cma.ca/sites/default/files/pdf/virtual-care/ReportoftheVirtualCareTaskForce.pdf>)

Spokespersons from the organizations made their diagnosis and announced their recommendations for scaling up virtual medical services in February. After working on the report for 11 months, they came up with 19 suggestions.

Briefly, the partners are recommending that healthcare groups, governments and patients collaborate to:

- Develop national standards for patient health information access. (“In a virtual care ecosystem, the sum total of a person's longitudinal health information should be available in a single digital chart that is accessible to their entire circle of care on a need-to-know basis, irrespective of location.”)

- Support the efforts of the Federation of Medical Regulatory Authorities of Canada to simplify the registration and licensure processes for qualified physicians to provide virtual care across provincial and territorial boundaries. (More than nine out of 10 respondents to a CMA survey were somewhat or very supportive of the creation of a pan-Canadian licence permitting practice in all provinces/territories. Furthermore, 39% indicated that they would probably provide virtual care to patients in other provinces/territories.)

- Encourage provincial and territorial governments and provincial and territorial medical associations to develop fee schedules that are revenue neutral between in-person and virtual encounters. (“Medical services offered through virtual means should be considered as insured services and compensated at similar value to in-person services.”)

- Engage the CanMEDS consortium in incorporating and updating virtual care competencies for undergraduate, post-graduate and continuing professional development (CPD) learners.

- Develop a standardized pan-Canadian lexicon for virtual care.

At a time when Kaiser Permanente, a healthcare organization in the U.S. with 12 million members, is conducting 59 percent of its primary care encounters using virtual care, in Canada fewer than 1 percent of the interactions are done this way.

In a news release, Dr. Gigi Osler, Virtual Care Task Force co-chair for the CMA, said: “We hope this report will serve as a roadmap to scaling up virtual care in



Task force co-chair Dr. Douglas Hedden: Patient participation is needed, “Or else we will get it wrong.”

Canada, with the goal of hitting 10 million virtual care visits by 2025.”

To be sure, virtual care can be “a game changer”, as patient advocate Julie Drury said, speaking on a panel following the announcement in Ottawa. She pointed out that some patients are driving six hours a day to attend an appointment that may last only 15 minutes.

They're canceling work or they're unable to care for children because they're travelling to appointments or waiting in exam rooms.

In other cases, patients are unable to get to doctors, due to physical or psychological challenges, so it's much easier for them to “see” a doctor from their homes or offices on computer screens.

Dr. Yanick Beaulieu, an intensivist at the Montreal Heart Institute and founder of IIR, a telehealth company, said the benefits of virtual care run the other way, too, with

physicians benefiting. He noted that in Montreal, specialists at a clinic who treat handicapped youths travel for hours all over Quebec.

But by using tele-visits, they were able to save 96 hours of travel to treat 10 patients. He said, just imagine if that were expanded to 10,000 patients — doctors would save thousands of hours, which could be used for in-person care. It would also reduce travel expenses for the system.

What's more, as panelist Dr. Ed Brown pointed out, many people simply prefer interacting with their physicians virtually. “People want to text,” said Dr. Brown, who is CEO of the Ontario Telemedicine Network. He mentioned that OTN has been offering this service in trials and that texting “gets a 99.9 percent favourable rating.”

However, there are related problems in the area of virtual visits and receiving quality care, the panelists observed.

“The elephant in the room,” said Drury, is the issue of interoperability. While industry members consistently say that connecting computer systems is a simple, technical problem that can be easily solved, Drury pointed out that experts have been saying that for years, without delivering.

“Many smart people have worked at it for decades and haven't made it work,” she said. “But this needs to happen. We can't keep loading our information on CDs. We don't even use CD readers anymore.”

She added that interoperability problems aren't just an inconvenience to patients, they're also a patient safety hazard. Drury pointed to the case of Greg Price, a cancer patient who died after his results weren't properly transmitted — an instance of a communication gap leading to a catastrophic result.

“We need change to happen now,” she said, “not in five years.”

For his part, Dr. Brown noted that change will be difficult, as the healthcare system is not built to support innovation.

“Our public healthcare system is perfectly set up to stop innovation from spreading,” he warned.

“There are pockets of innovation, but only pockets.”

He said that most healthcare providers can't afford to test the new models. In some instances, the funding of hospitals favours the avoidance of innovative solutions.

For example, he observed that tele-monitoring of post-op heart patients can get them out of beds sooner and back into their homes. It also results in a 30 percent reduction in readmissions.

But some hospitals are rejecting the technology precisely because it is efficient; it removes low cost patients recovering in beds and replaces them with new patients who need more intense, high-cost services.

The answer, he said, lies in a restructuring of payment models, with a shift to value-based care. Hospitals and other providers must be compensated for their outcomes.

So, for example, they should be incentivized to move patients through and to prevent re-admissions.

In this case, technology would be seen as an enabler, rather than as a cost or something that will harm the bottom line.

Dr. Ewan Affleck, co-chair of the Task Force and a CFPC representative, said in his remarks that “special attention must be paid to the delivery of virtual care to indigenous peoples living in Canada.”

He mentioned that he has spent his entire career providing care to communities in the Northwest Territories and Nunavut, and that he's seen the difficulties faced by remote patients in accessing proper care.

“My own interest in telemedicine arose from seeing significant inequities in the delivery of care in the North, where there are higher mortality and morbidity rates. It's quite a tragedy, and frankly, a national disgrace.”

Implementing the recommendations of the Task Force “will require interprofessional collaboration,” said Dr. Douglas Hedden, co-chair and Royal college representative. He said that “national leadership is needed,” and that patients need to be included. “Or else we will get it wrong,” he cautioned.



Co-chair Dr. Ewan Affleck: Special attention is needed for the Canadian north and for indigenous peoples.





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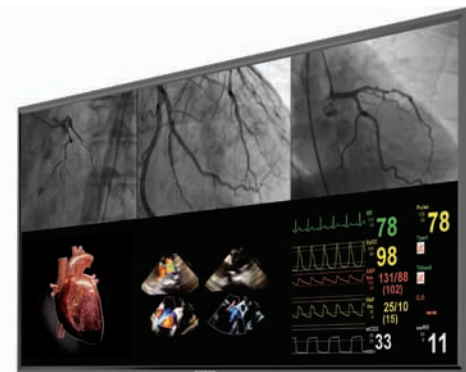


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# Eastern Health and partners launch innovation strategy and living lab

BY JERRY ZEIDENBERG

**S**T. JOHN'S, NL – Eastern Health, the largest health authority in Newfoundland and Labrador, is launching an innovation centre that will develop synergies between large and small companies, as well as hospital clinicians and researchers at Memorial University. It's a unique strategy that blends different kinds of organizations to produce innovations that will benefit patients and generate economic growth for the province.

Two RFPs brought 10 large companies into the project, including Medtronic, IBM and Deloitte. The medical innovation accelerator at Memorial University's medical school is planning to move into the new centre at Eastern Health, and the first entrepreneurial company is coming aboard soon. In all, the centre is already working on 20 different projects.

"We're all working together to generate new ideas," said Eastern Health's president and CEO, David Diamond. "It's a nice continuum, from large to small, and everyone we've talked to wants in."

Interestingly, the health authority has also launched a "living lab", in which companies and innovators can work with clinicians to test their ideas at the health authority. With permission from patients, this could include everything from medical devices to software to clinical trials.

In February, Eastern Health announced an investment of \$1.7 million in its innovation strategy and living lab, of which \$960,000 is coming from the federal government's ACOA, and another \$500,000 is being contributed by the province.

Most of the funding will go towards human resources, such as hiring new project managers and consultants with expertise



Eastern Health President and CEO David Diamond discusses the initiative at a conference in St. John's.

in growing entrepreneurial enterprises or running clinical trials.

Diamond noted that it's really a collaborative enterprise between the health authority and its partners. Not only are companies and researchers coming into the innovation centre to test and develop new systems, but hospital clinicians are regularly pitching companies on ideas that they've come up with and for which they need a development partner.

The idea is not only to help local hospital patients, and the community and home care clients it looks after, but to devise new technologies that could be marketed across Canada and around the world.

"If they're important and useful here in Newfoundland and Labrador, they're likely to be of interest to others as well," said Diamond.

While the commercialization component will be left with the corporate partners, Eastern Health has negotiated royal-

ties or some form of compensation on all 20 projects that it's currently working on as part of the innovation strategy.

Along with its partner Medtronic, Eastern Health is about to start an innovation project in "value-based procurement" for diabetes care. In this arrangement, it has negotiated outcome targets for a group of 200 diabetic patients. Medtronic will supply the technologies and methodologies for treating the patients, and if the targets are met, the company will be paid; if it doesn't, it will absorb the costs.

The model is new to Eastern Health and may very well be new among hospitals in Canada. Diamond said the approach could be expanded to other areas of care within the health authority. In creating the program, Eastern Health has also worked with the University of Tennessee and Dr. Anne Snowden, Professor of Strategy and Entrepreneurship at the University of Windsor's Odette School of Business.

A project in dialysis will see Baxter create a simulation centre in St. John's, where a good deal of dialysis currently goes on. It will be used to teach staff in the latest technologies and techniques, and to train patients in home dialysis.

With Mobia, Eastern Health has been involved in a project for smart scheduling in the area of phlebotomy. "We're working with patients so they can choose their appointments for blood draws at times that are convenient for them, rather than for us," said Diamond.

"This, too, could be rolled out through many areas of the hospital, but we're starting in phlebotomy."

And a project with IBM is applying artificial intelligence to the issue of employee wellness, to help with the health of staff. "This is a really interesting project, and we're just about to turn it on," said Diamond.

A system called Surgecon, which was devised by a physician and nurse in Carbonear, N.L. to detect patient surges in the Emergency Department and to help plan ways of handling them, was further refined in collaboration with Medtronic. The solution, said Diamond, will soon be marketed by Medtronic.

Part of the goal of Eastern Health's innovation strategy is to mobilize innovation throughout the organization – not only to implement new ideas, but to bring them forth from doctors, nurses and allied professionals.

Diamond agreed that getting everyone in a health authority onboard with an innovation strategy is a challenge.

But his approach, as president and CEO, is "to talk about innovation in the broadest sense", he said. It's not just technology that's meant by innovation, but improvements in processes and services.

## Nurses explore new ways of delivering patient care using I.T.

BY LAUREN MACDOUGALL

**I**nnovating since the days of Florence Nightingale, nurses continue to strive to deliver better patient care. However, this does not necessarily mean in a healthcare facility or at the patient bedside.

With the increase in the use of digital technology to manage patient information and care, many nurses have transitioned into the realm of information management and technology.

Following is an opportunity to meet some of the leaders at Nova Scotia Health Authority's Information Management and Technology (NSHA IM/IT).

**Andrew Nemirovsky, RN**  
*Senior Director, NSHA IM/IT,  
Chief Information Officer*

As the senior director of NSHA IM/IT and the provincial health authority's chief information officer, Andrew Nemirovsky is challenging traditional ideas of the role of nurses. For example, he is among a growing number of men entering nursing, which, in the past, has been

primarily dominated by women. In fact, over a recent five-year period the growth in the number of male nurses in Canada was three times that of female nurses, according to CIHI statistics.

Nemirovsky's experience both at the patient bedside and in various clinical health informatics positions throughout his 14-year career have positioned him for success in his current role. Andrew brings a combination of clinical and IT perspectives to ensure clinician workflows and improvements to patient care are paramount in the design and delivery of any new clinical IT systems.

Nemirovsky has contributed to local and national digital health associations in relation to conference planning, the writing of white papers and mentorship opportunities for new health IT professionals. He is currently in his last term of his Masters in Health Informatics as he recognizes the value that clinical informatics brings to the healthcare continuum.

IM/IT employs 15 registered nurses/LPN who support and inform the delivery of healthcare through clinical applications and systems, virtual care tech-

nology and health informatics. "Technology is critical to the modernization, sustainability and ability to provide the best care to patients," says Nemirovsky.

**Annie Gillis, RN**  
*IM/IT Virtual Care Lead,  
Nova Scotia Health Authority*  
As a registered nurse with over 30 years' experience, Annie Gillis brings a unique clinical perspective to her role as the virtual care lead for the province's Virtual

**With the increased use of digital technologies in patient care, many nurses have developed expertise in I.T.**

Care team at Nova Scotia Health Authority's St. Martha's Regional Hospital in Antigonish.

Gillis is a champion of the team's vision to bring patient care closer to home, using audio and video technology to connect patients with healthcare providers in other locations and improv-

ing access to quality, person-centred care.

Gillis provides a bridge between clinicians and the IM/IT team. She engages with healthcare providers to support them in navigating the virtual care environment and understanding the effect that using remote technologies will have on their clinical practice and workflow and the patient at the local healthcare facility or site.

As a former Telehealth site coordinator, Gillis has a strong understanding of the patient's virtual care experience at the local healthcare facility. She connects healthcare providers with the nurse at the patient site and provides support to the nurse on how to participate in a virtual appointment and how best to support the patient.

Many health service areas across the province's two health authorities, NSHA and the IWK Health Centre are offering patients the opportunity to participate in virtual care appointments, including: mental health and addictions, orthopedics, neurology, chronic pain, among many others.

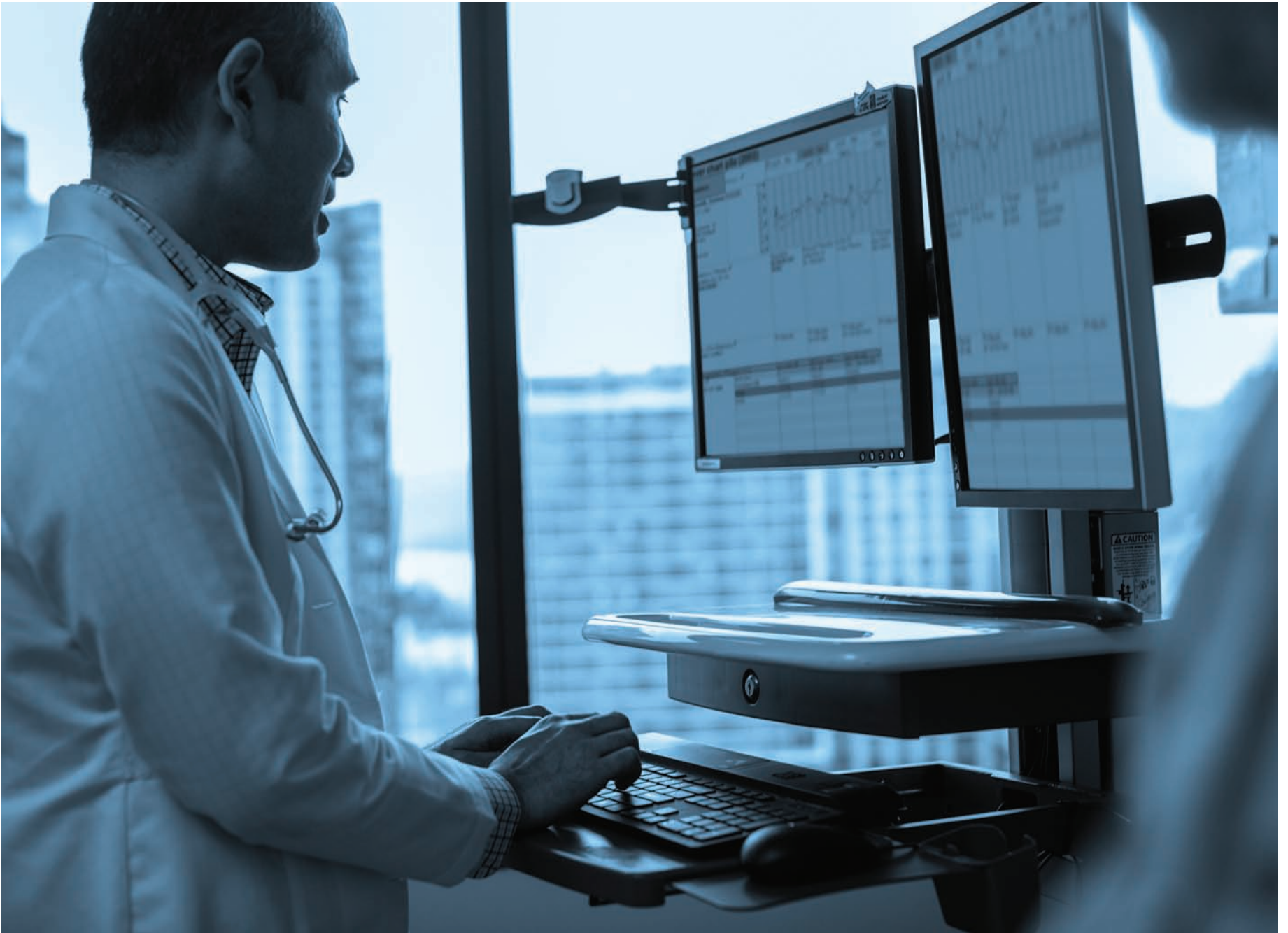
At the local regional hospital in Sydney Cape Breton, Virtual Care is being

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# This tech startup is giving hospital beds a much-needed makeover

Not much has changed for the hospital bed since it first began appearing with electrical functions in the 1950s. Since then, new and more advanced technology has been added to its frame – but the overall concept and design has remained relatively unaltered. Norwegian startup Ably Medical is on a mission to reimagine the hospital bed as we know it today, and in doing so, revolutionize the culture of health care.

**The case for a new kind of hospital bed:** Hospital beds are central to patient recovery and the administration of healthcare services. On the flip-side, they can also contribute to serious injuries, especially among older adults living with dementia. According to the Canadian Institute for Health Information, more than 3,000 cases of pressure ulcers (also known as bedsores) are reported in acute care hospitals across Canada each year. Bed rails, a safety measure designed to keep patients from falling out of the bed, can cause fatal cases of bed entrapment.

Moving patients in and out of hospital beds can also increase the risk of injuries for hospital care staff.

Seeking to mitigate the challenges caused by hospital beds, Ably Medical created a new kind of bed that leverages artificial intelligence (AI) to provide safety and comfort to both patients and caregivers. In addition to these benefits, the Ably Bed's design functions will decrease the nurse to patient ratio required to move and assist patients, ease the strain on resources and lower costs to the health care system.

**How the Ably Bed works:** The Ably Bed is a smart bed that consists of longitudinal motion springs made with built-in sensors that monitor vital signs such as heart rate,



respiration rate and weight. The data collected allows the bed to adjust to specific patient needs and forms the basis for its learning capabilities.

The bed also notifies staff if a patient is at risk of further injury or a decline in health conditions. If a patient is at risk of falling, the Ably Bed will adjust its flexible frame to 'cocoon' the individual, giving nurses time to react and prevent the fall.

Flexible motion springs in the bed's frame also help to turn patients over and alleviate built up pressure points along the body. Staff can adjust the length and position of the springs to provide leverage when repositioning or moving patients, lowering the strain on their bodies and risk of injury.

Ane Solesvik Oppedal, head of Ably Medical's North American operations, believes that the bed will increase the quality of hospital care. "It will help to maintain more dignity, more comfort for the patient, which is very important," she says.

Oppedal adds that the Ably Bed has the

potential to reduce healthcare costs because it requires less equipment and nursing support to help patients stay safe and comfortable.

**Testing the Ably Bed:** When Ably Medical needed a way to test and validate their product in a real-world setting, the Centre for Aging + Brain Health Innovation (CABHI), powered by Baycrest, extended support through their Industry Innovation Partnership Program (I<sup>2</sup>P<sup>2</sup>).

The I<sup>2</sup>P<sup>2</sup> program connects innovators to health care organizations across North America where they can derive scientific evidence and user validation, which can lead to faster procurement of their solution. The program has helped foster global organizations like Ably Medical to set up operations in Toronto, thus creating foreign direct investment into Canada.

Through I<sup>2</sup>P<sup>2</sup>, CABHI brokered relationships between Ably Medical and four Canadian healthcare organizations (Hamilton Health Services, Mackenzie Health, West Park Healthcare Centre, Southlake Re-

gional Health Sciences) where they tested the ability of the Ably Bed to prevent falls, pressure ulcers, and excessive nurse burden.

The research project is being led by Alexandra Papaioannou, executive director of the GERAS Centre for Aging Research, with CABHI's support. Under Papaioannou's leadership, front-line healthcare professionals were invited to engage in the project's design-thinking process. "What was most exciting for me as a clinician scientist was seeing how engaged staff were in the project," she says.

"CABHI supported us in all the important steps you don't realize you need for innovation," Papaioannou says of CABHI's involvement. "They helped us with everything from contracts to teleconferences and helped us engage with stakeholders."

Oppedal says having access to the Canadian market has provided valuable learnings for Ably Medical. "The work here in Canada has guided us to the stakeholders we need to involve in the process of designing and shaping what this technology will become," she says.

Ably Medical hopes to use their experience to finalize finishing touches on the Ably Bed technology before launching the bed in Canada in 2021. Oppedal believes tapping into the Canadian market positions the company for expansion throughout North America and Asia.

"We still have a lot of research to do and there are really great opportunities for us to do that here in Canada," she adds.

With CABHI's support, Ably Medical is closer to realizing their goal of re-engineering the hospital bed – and by virtue the global healthcare system – creating even greater opportunities for older adults to access the quality care they need.

## Virtual Health Visits are helping patients in BC stay well, at home

BY KRIS OLSEN

As Canada's third-largest province, British Columbia's size and terrain means many residents live in rural and remote communities, and don't have equitable access to care. In many instances a patient will avoid going to a doctor if it involves time, travel or significant cost – often at risk to their own health.

The Office of Virtual Health (OVH) is a Provincial Health Services Authority (PHSA) initiative mandated by the BC Ministry of Health to enhance Virtual Health as part of the care continuum. With a goal to bring care to patients wherever they are, the OVH leads and provides strategic direction for the overall Virtual Health initiative at PHSA and is collaborating with clinical programs across PHSA on projects that test technology solutions.

"Our work at OVH is always patient-centred, so the purpose of our projects is to test solutions to demonstrate how well the technology works for the pa-

tients' needs and how well it works for clinicians within their programs," said Kathy Steegstra, senior provincial executive director Virtual Health at PHSA.

Projects testing Virtual Health Visits are connecting clinicians with patients, wherever they are, for counselling, pre- and post-surgical assessment, as well as follow up visits for various healthcare needs, including mental health, primary care, cancer care, specialty and sub-specialty needs.

Since May 2019, several clinical programs have been testing a Virtual Health Visit technology platform called VirtualCare from Think Research, a Canadian health technology innovator. The secure platform allows healthcare providers to host virtual visits with patients over secure video, audio or chat.

"The OVH launched Virtual Health Visits using the Think Research platform in May 2019, and as of February 18, 2020 it has now been tested in 15 specialty clinical areas across PHSA. 171 patients have registered with the platform, and more than 300 visits have been completed – with a 97 percent success

rate for video connection – while over 1,100 chat messages have been exchanged between providers and patients," said Steegstra.

**How does the Think Research platform work?** There are two ways to access the VirtualCare application: via the web portal on a laptop or desktop or the mobile app free for download from the Android or iOS app store. Both providers

**PHSA has tested virtual care in 15 specialty clinical areas across the authority, using video and chat messages.**

and patients will have a unique account with a user-name and password to access the application.

Patients can be registered by their clinic or complete self-registration. Providers can request a visit with the patient when there is a need for an appointment.

In addition to provider and patient roles, there is an administrative role to support the booking and scheduling of

visits. At the time of the visit, providers and patients can connect via secure video, audio and chat. The chat function also allows for the exchange of pictures, documents, forms and links.

**Existing functionality of application matched our clinical needs:** Clinical programs testing VirtualCare are using the Think Research application as an out-of-the-box solution. "We selected VirtualCare for demonstration as the existing functionality aligned well with our project and clinical requirements," said Ying Jiang, the OVH project manager leading the initiative. "We did make a few configurations based on clinical operations requirements and specific population need. For example, we optimized the 'sex' option button to present gender-affirming language for the Trans Care BC clients."

**Using Virtual Health Visits to bring care to patients in rural B.C.** BC Emergency Health Services' community paramedicine program is using the Think Research platform to support aging patients with chronic conditions who have limited access to care due to mobility issues or

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# Virtual platform gives spinal cord injury patients access to home care

BY NEIL ZEIDENBERG

The VIRTUAL Integrated Platform for Spinal Cord Injury (VIP4SCI), a two-year-old pilot project for Spinal Cord Injury Ontario (SCIO), recently received the go-ahead for a rollout across Ontario.

Developed by ForaHealthyMe Inc., a virtual care solutions provider, VIP4SCI allows spinal cord injury patients to communicate more easily with doctors and social service providers. Instead of travelling for their in-person appointments, which can involve difficult wheelchair transport,

patients can stay home and see their care providers using videoconferencing.

Other useful features are integrated into the system, including email, scheduling, a medication management system, spinal cord injury assessment tools, a journal to help track goal setting, along with tele-

health services, which are critical for spinal cord patients who need to access health expertise remotely.

"We wanted to offer better support to our clients, allowing them to live independently while providing improved access to Primary Care," said Dr. Stuart Howe, CEO of Spinal Cord Injury Ontario (SCIO). Access to care providers in-home has many benefits, like reducing the need for unnecessary travel.

Over 36,000 Ontarians are living with and managing a spinal cord injury. For patients living in remote regions of Ontario, a virtual consultation with their health-care provider can save three or more hours of driving and eliminate 250 km or more of travel.

As well, family members and regional community support staff who accompany patients are also spared from a day of travel.

The technology was fully customized to the patient's needs. "ForaHealthyMe built it keeping in mind how a person with an SCI can interact with software," said Dr. Howe. "Some have limited mobility and use sip/puff or a joystick to navigate screens."

By understanding a patient's circumstances, the solution was designed to be as accessible as possible. "This demonstrates the flexibility of the technology we've developed – that we can work with a client, understand the problem they're trying to solve and how technology can help to address those gaps," said Courtney Cole, CEO of ForaHealthyMe. "Then we work with the partners to develop the solution and deploy."

There are many patients with similar mobility and communication challenges that can also benefit from in-home patient/provider tele-consultation. Patients with ALS or multiple sclerosis are two examples.

And thanks to changes in government legislation, Ontario is helping physicians make better use of remote consultation, and to be able to bill the province for payment.

For the pilot in 2018, 50 patients with a spinal cord injury were selected in different regions of Ontario where a regional service coordinator was close by. For patients to participate, they had to be tech-savvy enough to use a computer or tablet and manage the connectivity.

On average, the SCIO and the company provided about three-hours of training for each person. Overall, it took about eight weeks to complete the training.

And according to Cole, 100 percent of those patients said they wanted to continue using it. Based on some of the data and user feedback, further improvements were made to the solution and it's now even easier to use.

"We added a new component, access to tools for family caregivers," said Cole. "That includes community-level support, engagements with other family caregivers through messaging and discussion boards, but also through use of video tools for peer-to-peer engagement."

Now, with the go-ahead for expansion, the technology can be extended to more patients. "Over the next year we'll be recruiting more of our clients and encouraging them to use this technology," said Dr. Howe.

Both the Centre for Family Medicine in

CONTINUED ON PAGE 15

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# Virtual medication reconciliation on discharge coming to hospitals

To support small and rural hospitals with patients transitioning from hospital to home, Northwest Telepharmacy Solutions (NTS) is launching their Virtual Medication Reconciliation on Discharge (VMRD) program to several hospital clients across Ontario.

The VMRD program will build on evidence-based literature supporting the role of a hospital pharmacist involved with medication reconciliation and counseling on discharge, including follow-up with patients in their homes within 72 hours of transition out of the hospital.

“Recent studies have shown a significant decrease in hospital readmission and ER visit rates following discharge when a pharmacist conducts discharge medication reconciliation and provides patient counselling,” says Kevin McDonald, pharmacist, founder, and Director at NTS.

“We have a unique opportunity to use our skills and expertise to be more actively involved with patients and their providers to help reduce the number of unintentional medication discrepancies which occur during transition to home.

Use of virtual technologies for video chats – or simply a phone call – offers a tremendous opportunity to improve care and reduce strain on the healthcare system overall.”

NTS has been providing remote hospital pharmacist services for over 15 years and currently services more than 60 hospitals across Canada, 24/7, 365 days a year.

NTS’s delivery model helps provide access to remote hospital pharmacists during the day to free up on-site hospital pharmacists to be more involved with clinical decisions; during the evening to extend pharmacy service hours; and overnight to help



Delivering innovative telepharmacy: Christina Adams, Kevin McDonald (on robot screen) and Paula Newman.

review in real-time physician orders entered in computer prescriber order entry (CPOE) models.

As hospitals transition to more sophisticated medication and care tracking tools such as CPOE, electronic medication administration records (eMARs), bedside medication verification (BMV) and a host of other technological upgrades, the role of the pharmacist to ensure accuracy and safety around the clock increases.

Ontario Health has released their Quality Statements for Transitions between Hospital and Home with emphasis on patients having their medication reviews on admission, on discharge, and once they are home. The medication reviews would include medication reconciliation, adherence, and optimization, as well as ensuring patients know how to use their medications.

Currently most hospitals are challenged

to hire and fund pharmacists to provide a comprehensive Medication Review with Reconciliation program at admission, transfers of care, and discharge seven days a week despite the growing evidence to have pharmacists actively involved in the process.

Recent studies utilizing hospital pharmacists to teach patients at the bedside the medication uses (and changes) that occurred during their hospital admission with follow up by phone or video call after discharge to ensure understanding of those changes were the key factors to reduced hospital re-admission at both 30 days and 180 days by 30 percent.

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 technology prior to the patient leaving the hospital, our pharmacists can converse and educate the patient all while reconciling their discharge medication list.”

To test the feasibility of delivering a VMRD program, NTS first conducted a pilot study at Lady Dunn Hospital in Wawa, Ont., where pharmacists interviewed patients that were at high risk of a medication-related adverse event upon hospital discharge using a telerobot – real-time mobile videoconferencing.

Following a discharge medication review by a pharmacist, each patient was provided with an accurate discharge medication list and counselled on their medications.

“We found the virtual interview was a positive experience for 80 percent of the patients,” says Paula Newman, Research Specialist and clinical pharmacist at NTS. “78 percent of patients had at least one error in their discharge medication list which was caught by the pharmacist before the interview even happened. Most of these errors on the discharge medication list were a missing medication.”

“Implementation of the discharge medication reconciliation program using a telerobot demonstrated remote hospital pharmacists are able to assess medication therapy, resolve medication-related issues and communicate with patients and their providers about their medications while in hospital before discharge.”

Starting in the spring 2020, NTS will be delivering the VMRD program at five hospitals across Ontario with the goal to expand to over 15 hospitals by end of the year, including larger sites.

## First-ever, full-service digital pharmacy expands across Canada

BY NEIL ZEIDENBERG

The store-front pharmacy has remained the standard for acquiring patient medication for over 100 years. But presenting a physical script to a pharmacy and then waiting for dispensing isn’t always convenient – especially when there are delays due to zero refills or wrangling over insurance coverage.

A solution is making its mark here in Canada. PocketPills is Canada’s first full-service digital pharmacy that pre-packages medication into convenient sealed packets; processes the orders from a distribution centre, and then ships it directly to customers’ homes on a monthly basis. Medication packets are sorted by dose, date and time.

Available in most provinces already, in 2020, PocketPills aims to expand their footprint into Quebec and Nova Scotia, and to offer same-day service.

Besides the cost of the medication, customers pay a \$7 dispensing fee and nothing for delivery. Refills are managed directly with a patient’s doctor so pa-

tient’s never run out of medication.

“Our customers are people from all walks of life: men, women, caregivers, etc. And being an online platform, PocketPills is more connected to the patient,” said Harj Samra, co-founder and COO of PocketPills. “It’s especially helpful to patients with chronic conditions requiring multiple medications.”

To start, customers create an account online or download the mobile app, and then provide their current pharmacy details. Finally, PocketPills will transfer all refills and renew any prescriptions.

Patients and caregivers can connect directly with a pharmacist by phone, email or live chat. All customer information is fully encrypted to ensure privacy.

PocketPills solves four key problems for consumers. Cost; Convenience; Adherence and Accessibility.

Cost: The price of drugs is increasing at a higher rate than inflation. PocketPills can help to choose the most clinically appropriate medication – name brand or generic. “We’re leveraging the technology we have to run operations efficiently and pass on those savings to all

payers. That equates to about 10 to 15-percent,” said Samra.

Convenience: Being available online means PocketPills can cater to people whenever, and wherever they are. Moreover, clients can check the status of their orders; inquire about a medication’s side effects, or the risk of taking a combination of medications together.

Adherence: People not taking their

**A chat feature lets customers speak with a pharmacist for advice and answers to commonly asked questions.**

medication, or taking it incorrectly, costs the economy billions in lost wages, absenteeism and disability each year. “It’s common in people with chronic conditions taking a variety of medications, and/or multiple doses,” said Samra. “We look after refills and any changes to prescriptions directly with a client’s physician so they never miss a dose.”

Accessibility: A chat feature lets cus-

tomers speak with an actual pharmacist for advice and answers to commonly asked questions, whenever they like – from anywhere in Canada. “For a family caregiver, PocketPills offers knowledge and peace of mind to them whenever it’s needed,” said Samra.

The company launched in October 2018, and has quickly expanded throughout the provinces and territories. Orders are processed in one of three centralized pharmacies and sent to customers direct via Canada Post, UPS or FedEx usually by the next business day – at no charge to the customer.

By downloading the app, customers can track the status of their shipments online. And if medication drop-off is attempted and there’s nobody home, the driver will leave a delivery notice card at the door and it will be held for pick-up at either a secured mailbox or the closest Canada Post location. It will never be left unattended at a customer’s home.

“Amazon is doing something similar in the USA, and they’re doing tremendous business. There is huge potential for people in Canada as well.”





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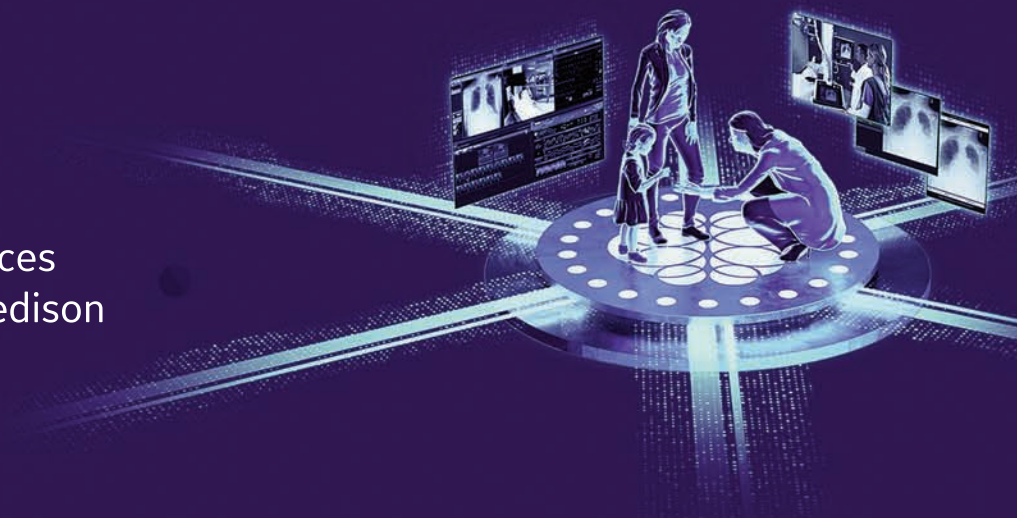
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# Cloud-based AI is being used to improve health outcomes and processes

A great example of AI supporting physicians can be found at Vancouver General Hospital.

BY DR. SHEZ PARTOVI

When it comes to advancing the health of Canadians, there's no question that artificial intelligence (AI) and machine learning will be driving care innovation in 2020. From personalizing the patient health journey to accelerating precision medicine, AI and machine learning tools are supporting clinicians with data-driven insights to improve health outcomes and the patient experience.

Cloud computing is a key enabler, creating an environment in which it's easier to experiment with new innovative solutions. By simplifying the path to building and deploying advanced AI, analytics, and machine learning tools, we're creating a future for Canadian healthcare that thrives on the intelligent use of data to improve care.

A great example of AI supporting physicians can be found at Vancouver General Hospital (VGH). Working with researchers at University of British Columbia, VGH used AWS technology to develop a new machine learning model that speeds diagnosis of pneumonia on chest X-rays and reduces time to treatment.

This AI tool is brilliantly embedded into the clinical workflow. When a patient comes to the VGH Emergency Department with symptoms of pneumonia, the ensuing chest X-ray is immediately analyzed by the AI tool even before a radiologist sees the study.

If the algorithm suspects pneumonia, it flags and escalates the study to the top of the radiologist's worklist. This means the radiologist reviews the films much earlier than if it were simply placed in the worklist in the order it was taken. Quicker review means quicker diagnosis and faster treatment for the patient.

This system was built using two solutions from Amazon Web Services. The first, Amazon Comprehend Medical, makes it easy to use machine learning to extract relevant medical information from unstructured text, like medical charts or doctor's notes. The second solution, Amazon SageMaker, provides

all of the components used for machine learning in a single toolset so models get to production faster, with less effort and at lower cost.

We see AI being applied in three areas to advance care: predicting patient health events, personalizing the health journey and promoting interoperability.

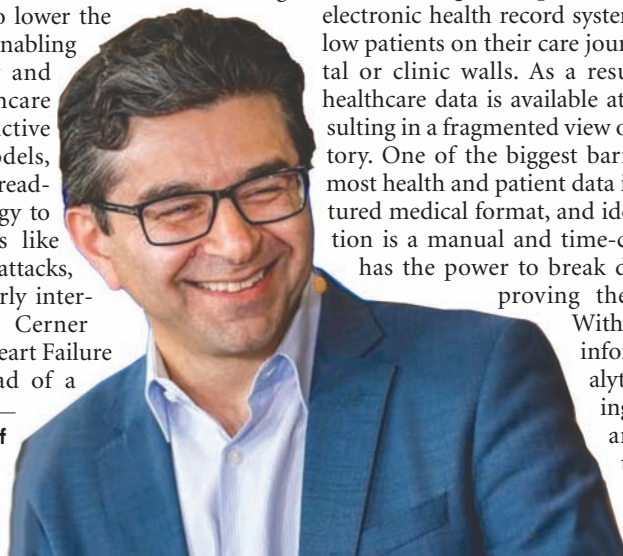
**Predicting patient health events:** We're seeing a renaissance in healthcare as organizations leverage machine learning technologies to uncover new ways

**Aidoc's always-on, decision-support software analyzes CT scans on AWS to flag acute abnormalities, prioritize urgent studies and expedite patient care.**

to enhance patient care, improve health outcomes, and ultimately save lives.

As the industry shifts towards value-based care, AI and machine learning, paired with data interoperability, will improve patient outcomes while driving operational efficiency to lower the overall cost of care. By enabling data liquidity securely and supporting healthcare providers with predictive machine learning models, clinicians will be more readily able to use technology to forecast clinical events like strokes, cancer or heart attacks, opening the door to early intervention. For example, Cerner can detect Congestive Heart Failure about 15 months ahead of a

**Dr. Shez Partovi is director of worldwide business development for healthcare, life sciences and genomics, Amazon Web Services (AWS).**



clinical manifestation – all done with the power of AWS's machine learning services. Pairing this predictive tool with real-time integration to individual health records can support provider decision making in real-time. Future projects will look to improve pre-procedural decision and interventions for chest pain using a cardiovascular prediction model.

**Personalizing the health journey:** For many healthcare organizations, creating a frictionless and more personalized experience for patients is top of the list. We are living in a consumer-centric world where our best experience anywhere is what we expect everywhere. For example, Aidoc's always-on, AI-based, decision-support software analyzes CT scans on AWS to flag acute abnormalities, prioritize urgent studies, and expedite patient care.

To date, Aidoc has analyzed more than 3.2 million cases at more than 300 medical facilities around the world. At one major U.S. medical center, the Aidoc solution reduced patient ED visits by an average of 59 minutes and overall hospitalization time by 18 hours.

**Promoting interoperability in healthcare:** Most electronic health record systems (EHRs) do not follow patients on their care journey beyond the hospital or clinic walls. As a result, only a portion of healthcare data is available at any point of care, resulting in a fragmented view of a patient's health history. One of the biggest barriers right now is that most health and patient data is stored in an unstructured medical format, and identifying this information is a manual and time-consuming process. AI

has the power to break down this barrier, improving the patient experience.

With access to all available information, advanced analytics and machine learning can enhance medical and scientific insights tied to patient outcomes in an accurate, scalable, secure, and timely manner.

## How AI and analytics can contain the next pandemic

BY STEVE BENNETT

A toddler in Guinea, on the west coast of Africa, plays with some bats in a tree stump. In the next two and a half years, at least 11,000 people from half a dozen countries in Africa – along with isolated cases in Europe and North America – will die from the Ebola virus, “the largest, most complex and most severe” pandemic of modern times, according to the World Health Organization (WHO).

Three out of four new diseases in humans have jumped from other species, says the Centre for Disease Control (CDC). Migration patterns, international travel and novelty of diseases can spread pathogens like

avian flu or the current coronavirus across the world in weeks. Fortunately, the huge volumes of data we collect on a day-to-day basis can help limit the exposure of such pandemics, and even predict them.

Analytics and artificial intelligence technologies – machine learning in particular – can mine and manipulate these stores of data to contain these outbreaks in the four phases of these disease events.

Prediction. Human population is growing almost unchecked, and as we spread to other habitats, we interact with new species, and in different ways. The exotic animal market is increasing in size and diversity. These two factors combine to create more opportunities for animal-borne dis-

eases to jump to humans. Scientists studying the risks of global viral pandemics say there are as many as



Steve Bennett

800,000 unknown animal viruses. By integrating data about known viruses, animal population and migration patterns, and human demographics, travel patterns and cultural practices, AI can predict hotspots where new diseases could emerge. That helps governments and public health non-

governmental organizations (NGOs) prevent new outbreaks, or at least prepares them to respond.

Detection. When animal-borne viruses make the jump to humans, possibly becoming airborne contagions, time is of the essence. As we've seen with the current coronavirus epidemic, and its cousin Severe Acute Respiratory Syndrome (SARS), the speed and accessibility of human travel can spread a virus like wildfire. A man on Air China Flight 112 spread SARS to 20 people as far as seven rows away on a three-hour flight; epidemiologists had previously estimated it would require an eight-hour flight to infect just those in adjacent rows.

As Director of the National

CONTINUED ON PAGE 22



# What AI adoption really means for Canadian healthcare organizations

BY LAURIE LAFLEUR

There's no question, artificial intelligence in healthcare is an exploding market, expected to reach more than \$35 billion by 2025 with an impressive annual growth rate of more than 50 percent! It's no surprise that this emerging technology – which has been successfully leveraged across a number of other industries to deliver massive improvements in terms of operational efficiency and cost savings – has captured the attention of healthcare executives across Canada and the United States, as it holds huge promise for improving the cost, efficiency, and quality.

So then, why isn't AI deployed at every hospital? Certainly, it's not due to lack of interest, with more than 60 percent of CIOs reporting that they are actively pursuing AI strategies (an 88 percent increase from 2018). In fact, many are flocking to vendors, chequebooks in-hand, ready to take the plunge and meaningfully invest in AI.

Unfortunately, AI is not an off-the-shelf purchase and there are misconceptions regarding what it takes to successfully adopt and deploy it in clinical practice. This article discusses the most common misconceptions and answers the question “what does it really take to realize the benefits of AI in my organization?”

**AI isn't an 'off the shelf' purchase:** Many organizations think they can pick an AI application and simply integrate it into their environment, in no small part due to flashy vendor marketing. Unfortunately, this is false.

There is a plethora of AI algorithms available, ranging from clinical to operational use cases, including predictive analytics, automated image analysis, critical results detection and follow-up,

evidence-based decision making, and much more.

Each AI algorithm focuses very narrowly on a specific purpose, clinical condition, or diagnosis, and each has its own unique way of delivering and presenting findings to the responsible clinician.

The result is a myriad of alerts, icons, reports, and other artifacts that must be audited and reviewed by an already overworked clinical team. AI is still in the ‘wild west’ phase of innovation with few defined standards to support a consistent and seamless workflow for end-users.

To address this issue, Integrating the Healthcare Enterprise (IHE) is taking steps to create standards surrounding the integration, encoding, and presentation of AI results. In the meantime, a careful and phased approach to AI adoption that prioritizes the unique challenges and objectives of the organization and does not compromise on clinical workflow integration will help to ensure smooth and successful adoption and happy clinicians.

AI needs to be validated against your unique data environment – even if the application is already Health Canada or FDA approved.

Needless to say, quality assurance and change management are top priorities within healthcare organizations to ensure the continued safety and efficacy of care delivery. Introducing AI into clinical practice is certainly no exception, and in fact presents several unique and complex challenges.

First, even though an AI algorithm was validated against massive datasets, and even if it has been cleared by a regulatory body, it still needs to be validated against each local dataset that it will run against. No two hos-

pital organizations are the same, and therefore each has a unique data fingerprint.

Moreover, differences in technology ecosystems, image acquisition techniques, clinical documentation practices, and even the characteristics of the serviced patient population introduce variability and that can and will negatively impact AI accuracy.

And worse, it's common (even expected) for changes in data structure and semantics to shift over time due to a number of factors such as process changes, introduction of new systems or equipment, or changes in the patient population – referred to in data science terms as ‘data drift’.

Careful evaluation of the quality, completeness, and consistency of local datasets is an essential first step for ensuring accurate AI results. More importantly, establishing robust controls and tools to validate AI performance in clinical practice – before go-live and in perpetuity thereafter – is critical to confirm that the AI delivers on its promised benefits and ensures quality is monitored and maintained.

**Machine learning doesn't happen on its own – it needs a teacher:** Finally, many clinicians believe that AI will learn and improve on its own (hence the ‘learning’ component of machine learning). This again, is a misconception. While technically possible, there needs to be a feedback loop that teaches the AI when corrections are necessary. Ensuring these loops are non-invasive

to clinicians' workflow is essential for adoption and continued efficacy.

For models designated as Class II medical devices (or higher), these feedback loops do not result in real-time changes to AI behaviour. Rather, this information often needs to be fed back to the algorithm developer, who will supervise and validate the model's adaptations and adjustments before releasing a new, approved version for clinical use (which again will need to be re-validated against the local dataset).

There can be a huge return on investment for healthcare organizations who are willing to invest the time and effort into providing feedback and corrections that refine and improve AI performance. Managing expectations up-front regarding how corrections will be made and applied is a huge factor for successful adoption, as well as ensuring the AI vendor has designed feedback loops and workflow integrations that facilitate a seamless and efficient user experience.

So, what does it really mean to deploy AI in a healthcare organization?

The benefits of AI need no explanation – with seemingly limitless applications that promise to improve the quality, efficiency, and cost of care delivery the return on investment is clear. Successful adoption and deployment of AI in clinical practice requires a careful and thoughtful approach that begins with understanding and improving the quality of the underlying dataset.

*Laurie Lafleur is a healthcare information technology consultant with nearly 20 years of relevant experience in software engineering, product marketing, and strategy.*



Laurie Lafleur

## Spinal cord patients access home care

CONTINUED FROM PAGE 10

Waterloo, Ontario – a group that coordinated the patient-provider appointments during the pilot, and Toronto Rehab Institute – that conducted research on the platform will be re-engaged as the technology is rolled out.

In addition, SCIO is now working with the Parkwood Institute in London, Ontario to look at how VIP4SCI can be used to support in-patients as they transition back into the community. Parkwood Institute specializes in the treatment of patients with spinal cord injuries.

Unfortunately, in-home consultations can't resolve every patient problem, such as a non-routine check-up where a primary care provider requires physical examination. For this, patients and their families would need to make the drive to their doctor. “The main benefit is it reduces the difficulty of going for routine healthcare. It also reduces wait times to see a specialist or primary care provider; saves transportation costs, and improves the doctor-patient experience,” said Dr. Howe.

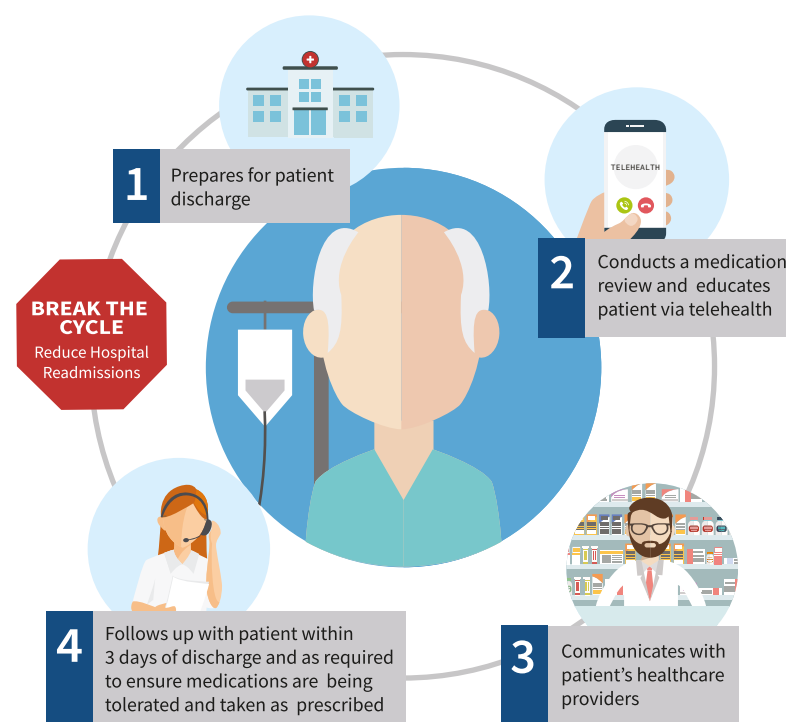
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# Point-of-care labs are transforming hospital care and reducing overall costs

POC testing allows results to be obtained much more quickly, and for patient care to occur more rapidly.

BY JERRY ZEIDENBERG

**P**oint-of-care technology for lab testing has come a long way, but there's still a fair bit of resistance to it in North American hospitals. That's due to a lagging perception that POC testing is more expensive than traditional benchtop testing – it no longer is, when all factors involved are considered. The hesitation is also a matter of ingrained habits – in many cases, people don't like to change their ways.

"My team had a really hard time letting go of printed results – but we made the decision not to have printers and I've never regretted that," says Patti DeJulio, Clinical Director, Respiratory Care Services at Northwestern Medicine Central DuPage Hospital, outside Chicago. DeJulio was tasked with replacing benchtop lab analyzers several years ago and made the decision – unique for the time – to go instead with point-of-care lab test devices from Siemens Healthineers.

DeJulio gave a talk in December at St. Joseph's Healthcare, Hamilton, at a day-long conference on point-of-care lab technology, sponsored by Siemens Healthineers. She outlined how her centre became one of the first hospitals in the United States to incorporate point-of-care labs enterprise-wide, for blood gas testing, using Siemens's EPOC technology.

She noted the devices use Bluetooth to send results from the bedside directly into the hospital's EPIC information system. That initially confounded some members of the staff, who were used to print-outs.

But the direct transmission of results eliminated the need for manual transcription and reduced errors. No wonder DeJulio doesn't regret this decision. There have been added benefits.

Her hospital formerly used four benchtop analyzers for blood gas results, processing some 2,000 samples a day in this way. Typically, blood gas analyzers are used to determine pH, blood oxygen, carbon-dioxide, hemoglobin, electrolytes and metabolite lev-

els. Nurses and other healthcare professionals would rush blood sample tubes from the bedside, in many cases, to a benchtop analyzer to obtain results.

The analyzer might be located far away from the patient – necessitating a dash through the hallways.

Frequently, however, the machine would be out of commission, due to the frequent need for calibration. "Now we're running through the hallways again looking for another machine," said DeJulio.

And she's wasn't alone, she said, "In having the experience of dropping or breaking a sample and having blood drip down your hand."

After the hospital acquired nine EPOC analyzers, this mad scramble was no longer an issue. Blood gas



results are obtained much faster, which is better for the patient and the hospital. Moreover, with the EPOC devices, there are no labels needed for samples, no sharps are required, and misidentification of patients rarely ever happens.

With faster results, she said, treatment can start faster – a major plus for the patient.

DeJulio cited studies of POC devices in the emergency room which showed how faster diagnosis and treatment had led to quicker turnaround times – resulting in higher efficiencies for EDs.

Once implemented, the DuPage Hospital staff liked the POC systems better than traditional benchtop analyzers, too. And an unexpected benefit occurred with team morale during cardiac arrest incidents.

In the benchtop analyzer days, when team members were busy with different tasks to revive an MI patient, one member would typically be asked to take a blood sample to an analyzer – leaving the group for up to 10 minutes. "You don't really feel like you are part of the team when you're away for 10 minutes in that situation," said DeJulio. But with POC labs, "it can be done right there."

When DeJulio and her colleagues at the DuPage Hospital were mulling the purchase of POC labs, they too assumed the costs would be higher than for traditional analyzers. But when they compared three years of costs for their existing analyzers versus the projected costs of the point-of-care systems, they were pleasantly surprised to find that POC was actually less expensive.

Those costs included everything from capital costs to the ongoing expense of supplies, maintenance and training. "There was a significant cost saving in going to POC," said DeJulio.

She is a firm believer that point-of-care technology is not only less expensive, but more effective. It's also helping her hospital deliver higher-quality care. A case in point is in the area of sepsis. "A lot of people die from sepsis, and we have to get better at treating it," said DeJulio.

She noted that treating sepsis patients quickly is extremely important. Before the use of POC technology, she said the lab at her hospital had a hard time turning around lactate tests – a key indicator of cardiovascular compromise – in less than 30 minutes. That was holding back the rest of the care team, which had a goal of diagnosing and starting treatment of sepsis in 60 minutes.

Once point-of-care units were used to diagnose lactate levels in suspected sepsis cases, however, the turnaround time dropped. "We get the lactates done really quickly," said DeJulio. At the same time, "mortality dropped dramatically," she noted.

## Point-of-care testing of anti-coagulants to be expanded this year

**A** point-of-care labs project in Peterborough, launched by Dynacare at a family health team site, has been so successful it will expand this year to four more clinics. The project makes use of portable Roche lab technology to test for Coumadin levels, and enables doctors on site to make faster decisions about patients.

"They can make decisions in a more timely fashion," said Dr. Jenisa Naidoo, Dynacare's chief scientific officer and VP of Clinical Development and Quality Assurance. "If the patient's medication needs to be adjusted, physicians can make the changes immediately."

Testing is done through a conven-

tional blood draw at the doctor's office, but the results are obtained in minutes, instead of in days. "We have a technologist in the clinic who manages the technology," said Dr. Naidoo. "It's very quick."

Dynacare is offering a similar service at several long-term care centres in the Greater Toronto Area. Many seniors are on blood anti-coagulants such as Coumadin, and having a point-of-care service renders decision-making faster and easier.

Often, a doctor makes rounds at seniors' residences and nursing homes once a week; having results available at the point-of-care makes it possible to adjust medication levels right away.

The technology is now very reliable, she said, and Dynacare technologists do regular checks to calibrate and ensure quality. "We've

**Having results available at the POC makes it possible to adjust medication levels right away.**

done a lot of validation of the technology," she noted.

Expansion into other provinces hinges on government regulations. Each province has its own rules and regulations regarding lab testing, but Dr. Naidoo believes that POC

will steadily be accepted across the country.

On another front, in rural Manitoba, Dynacare has been offering a point-of-care service for faster testing of blood glucose levels. Using a technology called Pixel, remote patients can take their own blood samples – a few drops of blood collected by finger-prick – and then send it by mail to the lab.

While the results are not instantaneous, the system is allowing patients to regularly measure their A1C levels in the absence of a collection point.

"It allows us to do more screening for diabetes in rural communities," said Dr. Naidoo.



# Niagara Health Navigator app puts patients at the centre of their care

BY STEVEN GALLAGHER

Steve Pavlovic doesn't hesitate to respond when asked where the launch of the Niagara Health Navigator app ranks over his nearly 20-year career in healthcare innovation.

"For me it's one of the most exciting things I've been part of," says Pavlovic, Niagara Health's Chief Information Officer. "The philosophy of this app is really changing the way the ecosystem of technology and healthcare has been developed over the last two decades."

Niagara Health, a multi-site hospital organization with a growing number of community-based services in Ontario's Niagara region, released the Navigator last fall. The made-in-Niagara digital solution makes it easier for patients and families to access health information, navigate the healthcare system and connect with their care team.

The app's launch was a proud moment for Pavlovic and his team at Niagara Health. But it's what the future holds for the app – which is available as a free download on a smartphone or tablet – that has Pavlovic even more excited.

The first release included features that allow users to see Niagara Health's Emergency Department and Urgent Care Centre wait times in real-time, provide feedback on the app, learn about the organization's programs and services and how they can thank a Niagara Health team member or express a concern.

In February 2020, Niagara Health released version 1.1 of the Navigator, providing users more healthcare content to support their well-being. New features include information on healthcare options in Niagara and how to seek mental health and addictions support, a direct link to the Ontario Caregiver Organization website and updates on the planning for the new hospital in South Niagara.

The plan is to gradually roll out features on the Navigator in what Pavlovic calls a "commonsense approach."

Getting feedback is critical to the app's development. Niagara Health, which has had more than 3,000 downloads of the app, is encouraging users to provide their input to ensure the Navigator meets the needs of its patients, their families and members of the Niagara community.

As Niagara Health Navigator grows and evolves, it will increasingly put patients at the centre of their care.

Future releases will provide users with real-time access to their health information, including booking appointments and checking test results, using a private and secure single sign-on identity management system, which would be a first in Ontario.

Mark Rajack, Project Director, Partnerships and Innovation at Niagara Health, says being part of the Navigator development team has been a rewarding experience.

"A lot of the changes happening in healthcare and the vision that the Ontario Ministry of Health has, it so closely aligns with the vision that we have for the Navigator and the benefits that can come out of it for the community," Rajack says.

"There is a potential that we are setting a model that can be used across the province. So to me to be part of that experience and work with like-minded individuals on something that can be so impactful, it's just amazing."

Pavlovic, who thanked technology partners IDENTOS Inc. and nCipher for helping to bring the Navigator to life, echoes Rajack's comments.

"This really shifts the paradigm of how we want to provide care," he says. "The conversation to me is not about the technology; it's around the patient experience. How can we remove anxiety? How can we make sure we are providing better care and how can we streamline care? That's where our clinical

community will really guide us to focus on the app releases in the future. We're creating an ecosystem that will allow our community different pathways to different services."

*Steven Gallagher is a Communications Specialist at Niagara Health.*

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# Investment firm Hg Capital acquires a majority stake in Intelera

After a relatively short search, Intelera has found a new majority stakeholder, Hg Capital. The London, UK-based investment firm has already invested over \$1B in the healthcare and life sciences sector, including firms such as Rhapsody + Corepoint (healthcare data interoperability), Allocate Software (healthcare workforce management) Evaluate (Pharmaceutical commercial information and advisory) and Medifox (ambulatory care services). The deal was expected to close by the end of Q1 2020, providing Intelera with a substantial new investor and war chest. So, what will Intelera do with the new funds and what challenges lie ahead?

Intelera has been one of the success stories of the imaging informatics market in recent years. While still relatively small, the Montreal-headquartered firm has been steadily gaining market share, a product of the relatively early evolution of its portfolio towards a platform-based solution to support enterprise radiology IT. This has brought success in the outpatient imaging and private radiology reading group segment in the US, Australia and New Zealand, while also supporting a disruptive entry into the US and UK acute hospital market.

In the short-term, the focus will remain along similar lines, especially given the changing shape of imaging services in the US, the largest single market for imaging IT globally. The provision of imaging services in the US is in a period of transition; increasing scan volumes, limited reading resources and declining reimbursement on account of changing care models is causing many large health systems to re-evaluate their imaging services.

We see three major trends that Intelera will be looking to leverage:

- Greater scrutiny on operational efficiency and workflow for imaging and diagnostic radiology services by large health systems and acute hospitals;

- Consolidation of the approximately 14,000 private radiologist reading groups into much larger regional and national entities, many of which have acquired or are acquiring outpatient imaging centres; and
- Growth in use of teleradiology services.

The firm is well positioned in the near-term to capitalize on these trends; the late 2018 acquisition of Clario has added capabilities supporting organizations measuring and tracking the operational performance of imaging service lines, which will only start to be realized this year following a period of integration.

This will be a useful asset for one of the key battlegrounds for the market this year – radiologist productivity. Given the fierce competition for deals and growing tendency for competitors to “race to the bottom” on price to win customer share, being able to prove clear return-on-investment (ROI) over the contract term helps differentiate the offering.

The platform-based portfolio and relatively early move offering SaaS contracting will also play well with the outpatient and small community hospital market, ensuring a degree of budget predictability. Intelera already has reference customers established at some of the largest regional and national radiology reading groups.

Opportunities in the acute segment will be harder to come by; while there is a growing focus on outsourcing imaging services (both in terms of image acquisition and diagnostic reading), few acute hospitals have taken the plunge yet. Moreover, contracts in this segment are more complex and influenced by a broader criterion, including capability in advanced visualization, artificial

intelligence, modality fleet management and professional services. Here Intelera is up against some of the giants in Healthtech, including GE Healthcare, Philips, Siemens Healthineers, Canon Medical Systems and Fujifilm Medical. Further intensifying competition, incumbents such as Agfa Healthcare, Change Healthcare and IBM Merge also have a significant customer base in the hospital segment.

However, as one of the earlier movers to an enterprise radiology focused portfolio, Intelera does have the opportunity to disrupt; the penetration of Sectra into a number of US acute hospital deals and Visage Imaging into the academic hospital segment in the last three years has shown the

**Increased bundling of hardware, software and services will exclude pure-play imaging vendors from some deals.**

market leading incumbents do not have the market locked-down.

Artificial intelligence is also a growing differentiator in purchasing decisions; while most customers don't expect vendors to be offering a full portfolio of AI-based image analysis tools yet, there is growing expectation to see a clear pipeline and strategy for integration or orchestration of AI into imaging IT products.

Intelera has already taken a first step with the launch of Odyssey, an “AI-Augmented workflow” triage tool that selectively and adaptively routes images to a range of clinical AI algorithms (utilizing Zebra's AI1 algorithm bundle). Boldly, the firm has also offered the new tool on a one year subsidized “try before you buy” option.

Combined, we think the progress made

in portfolio development fits well with current and near-term customer trends; therefore, we expect to see Intelera continue to gain momentum and market share in the near term.

The long-term outlook for Intelera is perhaps the most uncertain. We see definite potential based on current market trends and historical performance of the firm to support continued growth in the near and medium-term. This would put the firm into the \$100m-250m revenue range in the coming years.

However, the outlook for imaging IT software vendors in this “mid-tier” is unclear, especially given the impact of long-term market trends we are already observing. These include:

- Increased consolidation of health networks into larger systems and focus on simplifying IT system supply chains;

- Growing focus on “enterprise imaging”, especially for combining IT systems and imaging content from multiple different clinical departments (including cardiology, pathology, surgery, emergency medicine, endoscopy etc.);

- Increasing market competitiveness due to longer and larger deal sizes; transforms large imaging IT software deals from software transactions to longer service-based partnerships;

- Bundling of products (imaging hardware, clinical devices, monitoring systems, IT platforms and professional services) into long-term managed services deals; and

- The race for artificial intelligence integration and orchestration for image analysis, with strong competition for asset acquisition of leading independent AI software vendors.

Some of these challenges can be addressed with strong strategic partnerships and selective acquisitions of specific assets to meet the enterprise imaging and artificial intelligence trends. However, with larger and longer-term deals in several mature markets, there will be fierce competition and focus on layering on professional services and operational support to ensure customer retention.

We see this driving greater polarity in the competitive market, with large multinational healthcare technology and large imaging IT vendors more able to take near-term profit margin cuts to secure long-term deals, especially in the acute hospital sector. Moreover, increased bundling of hardware, software and professional services will also exclude pure-play imaging IT vendors from some deals.

As a mid-tier vendor, this will be a challenge for Intelera. It will need to secure the financial firepower to compete with the largest healthcare technology vendors in large, acute-hospital sector deals in the United States. Instead it may become more reliant on existing customers, strategic partnerships and the outpatient and ambulatory sectors. While the directional shift suggests that imaging services are also gradually moving from the acute sector towards the outpatient and private sector, how pronounced this trend will be will have a bearing on the long-term success of the firm.

For further information, contact Simon Harris, Managing Director & Principal Analyst, Signify Research Limited. [simon.harris@signifyresearch.net](mailto:simon.harris@signifyresearch.net), [www.signifyresearch.net](http://www.signifyresearch.net)

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# Biotricity launches pain management product with NeuPath Health

**B**iotricity Inc., a medical diagnostic and consumer healthcare technology company, announced that it has launched its innovative pain management product with CPM Centres for Pain Management, a subsidiary of NeuPath Health, Canada's largest provider of chronic pain management services. This is Biotricity's first expansion into the larger chronic care/pain

management market, where it hopes to address gaps in technology solutions for patient diagnosis and management.

NeuPath Health is the largest service provider in Canada for the highly fragmented chronic pain management market and operates chronic pain management clinics across Canada under two leading brands: CPM Centres for Pain Management and InMedic Creative Medicine.

NeuPath Health is focused on using innovative technology solutions to improve patient outcomes. (<https://chronicpainmanagement.ca>)

"All of us at Biotricity are excited with the launch of our pain management application," said Dr. Waqaas Al-Siddiq, Biotricity Founder and CEO. "The ability to commercially launch a product, with a partner like NeuHealth, gives us great

confidence. This new product will provide incremental recurring revenue on a per user basis, similar to our current Bioflux platform technology, enabling us to drive revenue growth."

The company's pain management product is comprised of a software suite with applications for both patients and physicians. Patients can track progress while quantifying and managing their pain.

Physicians are enabled to monitor patient progress remotely and intercede with treatment adjustments while gaining deeper insight into the interplay between pain management and treatment. They will also be able to test different solutions for chronic pain management with quicker feedback. The software is a platform that will be continually expanded to serve other segments beyond pain management.

Chronic pain has been linked to numerous physical and mental conditions and contributes to high healthcare costs

**Chronic pain and the opioid epidemic are key government concerns, driving new guidelines and innovation.**

and lost productivity. In 2016, according to The Centers for Disease Control and Prevention, an estimated 20.4 percent of U.S. adults had chronic pain and 8.0 percent of U.S. adults had high-impact chronic pain.

Chronic pain and the opioid epidemic are key government concerns, driving new government guidelines and recommendations focused on innovation. These considerations will be a part of the company's continued development of its pain management application.

"The rollout of our pain management software is the culmination of extensive research and development, and the start of Biotricity's foray into chronic disease markets outside the cardiac space," said Dr. Al-Siddiq. "With a high focus on innovation, NeuPath Health is an ideal first customer, providing us with important feedback as we continue advancing our technology."

The decision to work with NeuPath Health was the culmination of an extensive search to partner with an organization that is focused on providing groundbreaking solutions to its patients for pain management. Working with NeuPath has provided Biotricity with a customer and, most importantly, large-scale access to patients and pain management physicians in Canada. Biotricity will use an outcomes-based approach to customize its solution software for the U.S.

For its part, Biotricity is a modern medical technology company focused on delivering innovative, remote biometric monitoring solutions to the medical and consumer markets, including diagnostic and post-diagnostic solutions for chronic conditions and lifestyle improvement. Biotricity's R&D continues to focus on the preventative healthcare market, with a vision of putting health management into the hands of the individual. The company aims to support the self-management of critical and chronic conditions with the use of innovative solutions to ease the growing burden on the healthcare system. To learn more, visit [www.biotricity.com](http://www.biotricity.com).



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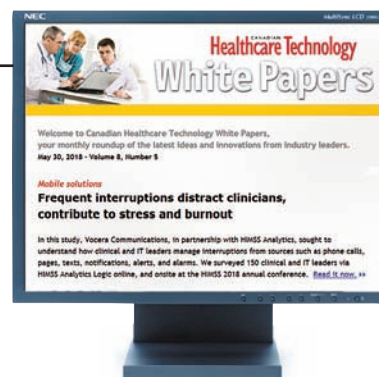
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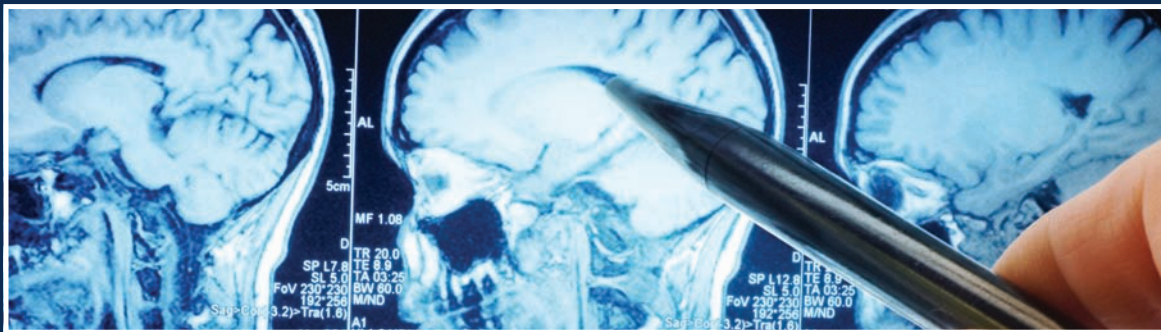


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Due to global concerns related to COVID-19 Coronavirus, we have made the decision to not proceed with the planned in-person meeting, but to host MIIT 2020 as a virtual meeting.

# Nurses are exploring new ways of delivering patient care using IT

CONTINUED FROM PAGE 6

used to deliver wound care services to patients. After one year, the number of patient appointments, on average, tripled from four in-person visits to 12 virtual appointments during the weekly clinic – a 300% increase. Virtual technology enabled patients to be seen more quickly and reduced the need for lengthy, uncomfortable ambulance trips from the patients' home communities. Between 2018 and 2019, virtual clinical appointments increased from 5,606 to 7,966 – a rise of 42 percent.

Virtual Care has been available in Nova Scotia since 1998 and in recent years has been expanded to include a desktop application for NSHA and IWK Health Centre healthcare providers (HCPs).

The following virtual care (video conferencing) technology is available in Nova Scotia:

- Telehealth Unit: A facility-based piece of equipment used for video conferencing. Available at all NSHA healthcare centres and some community partner locations. Facility-based telehealth units can connect to each other as well as to RealPresence desktop/mobile users.

- RealPresence: Video conferencing software is available for install on NSHA devices. Connects with telehealth units and/or other RealPresence desktop/mobile users.

- Virtual Visit: A patient appointment using a web-based videoconferencing solution to connect healthcare providers with patients in their homes, or other location of their choice, using an electronic device.

Nova Scotia's Virtual Care team is continuing to collaborate with clinicians and other partners to increase the number of services that use remote technologies to enhance both the patient experience and health outcomes. The team is also continuing to explore ways to leverage new and existing technologies to enable the expansion of virtual care across Nova Scotia.

**Mary Eileen MacPhail, RN**  
*Clinical Informatics Lead,  
One Person One Record – Clinical  
Information Systems Program,  
Nova Scotia Health Authority*  
Mary Eileen MacPhail is a Registered Nurse and informatician with NSHA in Halifax.

Throughout her nearly 30-year career in healthcare, she has had a passion for health informatics.

Mary Eileen has been an integral member of the Nova Scotia Nursing Informatics Group (NSNIG) for the past 20 years and is also an active member of the Canadian Nursing Informatics Association. Nova Scotia's Nursing Informatics Group describes nursing informatics as how all nurses manage the information they collect so that it is meaningful and contributes to quality patient care (reference). "By developing nursing informatics networks, we are building on the work of other nursing informaticians to develop standards both locally and nationally," says MacPhail.

In her role as a clinical informatics lead, Mary Eileen supports the integration of technology into practice. From design to education to delivery and evaluation, she is the liaison between NSHA's clinical and

technical worlds. Her goal is to ensure changes bring process improvement whether through better and/or easier data capture, improved patient care, access to clinical information or improved reporting.

In her role with the One Person One Record (OPOR) Clinical Information Sys-

**Nova Scotia's virtual care team is continuing to collaborate with clinicians to increase the number of services using telehealth.**

tems Program, Mary Eileen supports an interprofessional team and numerous working groups responsible for the development, adjudication and implementation of governance, evidence-informed best practice and standardization within the OPOR Program.

To increase awareness among clinicians

and other stakeholders about the benefits that technology and health informatics can have on the delivery of care and patient health outcomes, Mary Eileen hosts a monthly Let's Talk Informatics series. These workshops build a culture of evidence-informed decision making within Nova Scotia's healthcare system and are accessible to attend either on-line or in person.

Technology is a key enabler in the delivery of patient care by supporting healthcare providers, ensuring they have the information they need to make patient care decisions. Having access to timely, comprehensive information that provides more of a complete picture of a patient's health history, symptoms and test results can lead to better patient health outcomes. For more information about Nova Scotia Health Authority, visit [www.nshealth.ca](http://www.nshealth.ca).

*By Lauren MacDougall is a Senior Advisor with the Nova Scotia Health Authority.*

## Virtual health visits are helping patients stay well, at home

CONTINUED FROM PAGE 8

environmental factors. The project launched last July in the rural community of Boston Bar, B.C., where community paramedics visit elderly patients' homes to help them have a virtual appointment with a physician at the clinic in town.

The Virtual Health Visits save patients a trip to the clinic, or even further afield, to the nearest hospital 45 minutes away in Hope, B.C.

"Our target patient regions have aging populations with higher-than-normal prevalence of chronic conditions. Patients have limited access to care because of an inability for them to travel due to poor health, geographical and environmental factors," said Chris Michel, community paramedicine mentor with BCEHS, and initiative champion.

Case Ambrose is a community paramedic who assists elderly patients during the appointments in their homes, and sees the value of Virtual Health Visits first hand.

In a typical Virtual Health Visit, Case goes to the patient's home and connects with the patient's physician using a laptop.

As the physician watches, Case performs an assessment by physically examining the patient and taking the patient's vitals. Using a Bluetooth stethoscope, the sound of the patient's heartbeat and breathing is relayed to the physician through the Think Research platform. Case can also be responsive to the doctor's commands.

"Patients rave about it," said Case. "And they're getting medical care, whereas oth-

**Metrics from the platform are consistently positive, and 95% of patients says virtual visits are as good as in-person visits.**

erwise they may not make the trip [to the hospital]."

The BC Centre for Disease Control (BCCDC) is another clinical program benefiting from Virtual Health Visits as they are helping overcome the challenges of B.C.'s geography and the inherent long (and often costly) commutes.

The BCCDC provides clinical services for numerous communicable diseases and

has a provincial mandate around the prevention and treatment of these infections.

"We recognize the importance of health equity in our service delivery, but factors such as geography create challenges," said Devon Haag, digital public health manager for the BCCDC. "Virtual Health has great potential to help reduce these inequities and improve the accessibility of care across B.C."

**Virtual Health Visits are showing value:** Metrics from the platform are consistently positive.

Patients give Virtual Health Visits a high rating: 93 percent satisfaction rate for efficiency; 95 percent of patients think Virtual Health Visits are better or the same as in-person visits, and 97 percent of patients strongly agree that Virtual Health Visits were easy to navigate. "I didn't have the expense and time off from work to travel to Vancouver, as well as hotel fees. Big savings!" said a patient.

"So many factors are working together to make our projects successful," added Ying Jiang. "The OVH provides support to clinical programs as they integrate Virtual Health into patient care delivery. Program leaders, healthcare providers and administration staff combine efforts and learn from each other."

**Payment for physicians integrated into program's services:** Virtual Health is not a separate system of care – it is integrated into a clinical program's services, so physicians don't bill separately for Virtual Health Visits. B.C. has had billing codes for video visits in place for several years now, so fee-for-service providers can be compensated for Virtual Health Visits.

**Impact on the healthcare system:** For appointments that don't require an in-person visit, Virtual Health Visits mean patients can stay in the comfort of their homes without the need for travel, and that translates to saved time and saved costs. With a goal to drive adoption, PHSA is moving closer to making Virtual Health a mainstream care delivery option for the citizens of B.C.

*Kris Olsen is a Communications Officer with the Provincial Health Services Authority.*

## The next pandemic

CONTINUED FROM PAGE 14

Biosurveillance Integration Centre at the Department of Homeland Security (DHS), I oversaw the development of pilot projects that used machine learning to mine social media data and near-real-time emergency medical service and ambulance data for anomalies in flu symptom reports.

AI did a better, and weeks faster, job of predicting an out-of-the-ordinary disease event than traditional disease reporting. The sooner an outbreak is identified, the sooner protocols can be put in place to halt the spread and treat the sick.

Response. AI can help shape response to an emerging epidemic in two ways.

First, AI can integrate reams of data to help slow or halt the spread of the

disease event. At DHS, we leveraged travel and flight data, population data, even data from the Australasian Flyway, a migratory route used by birds to travel from China to Alaska and Canada, to predict outbreaks of new types of flu.

Years after the Ebola outbreak, a USDA travel census model showed the

**Machine learning can help policy-makers decide how to prevent future outbreaks using "what-if" scenarios.**

exact county in Texas – right down to the likeliest hospital – in which an Ebola case was likely to have appeared.

In addition, deep learning, another AI technology, can improve existing treatments and speed the development of

new ones. For example, chest X-rays of coronavirus patients can be used as input to create AI models that speed diagnosis.

Creating new vaccines and antiviral medications is time-consuming and subject to much trial and error. AI can examine data from similar viral diseases to predict what types of vaccines and medications are likely to be most effective.

Last year, the first fully AI-developed vaccine was created in Australia, saving years and millions of dollars.

Recovery. Once an outbreak is contained or has ended, machine learning can help policymakers to decide how to prevent similar outbreaks by performing "what-if" analyses to simulate the impact of policies and initiatives.

*Steve Bennett, PhD is the Director of the Global Government Practice at SAS.*





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