FEATURE REPORT: DEVELOPMENTS IN CONTINUING CARE – SEE PAGE 18

Publications Mail Agreement #40018238

CANADIAN
Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION SYSTEMS IN HEALTHCARE | VOL. 26, NO. 6 | SEPTEMBER 2021

INSIDE:

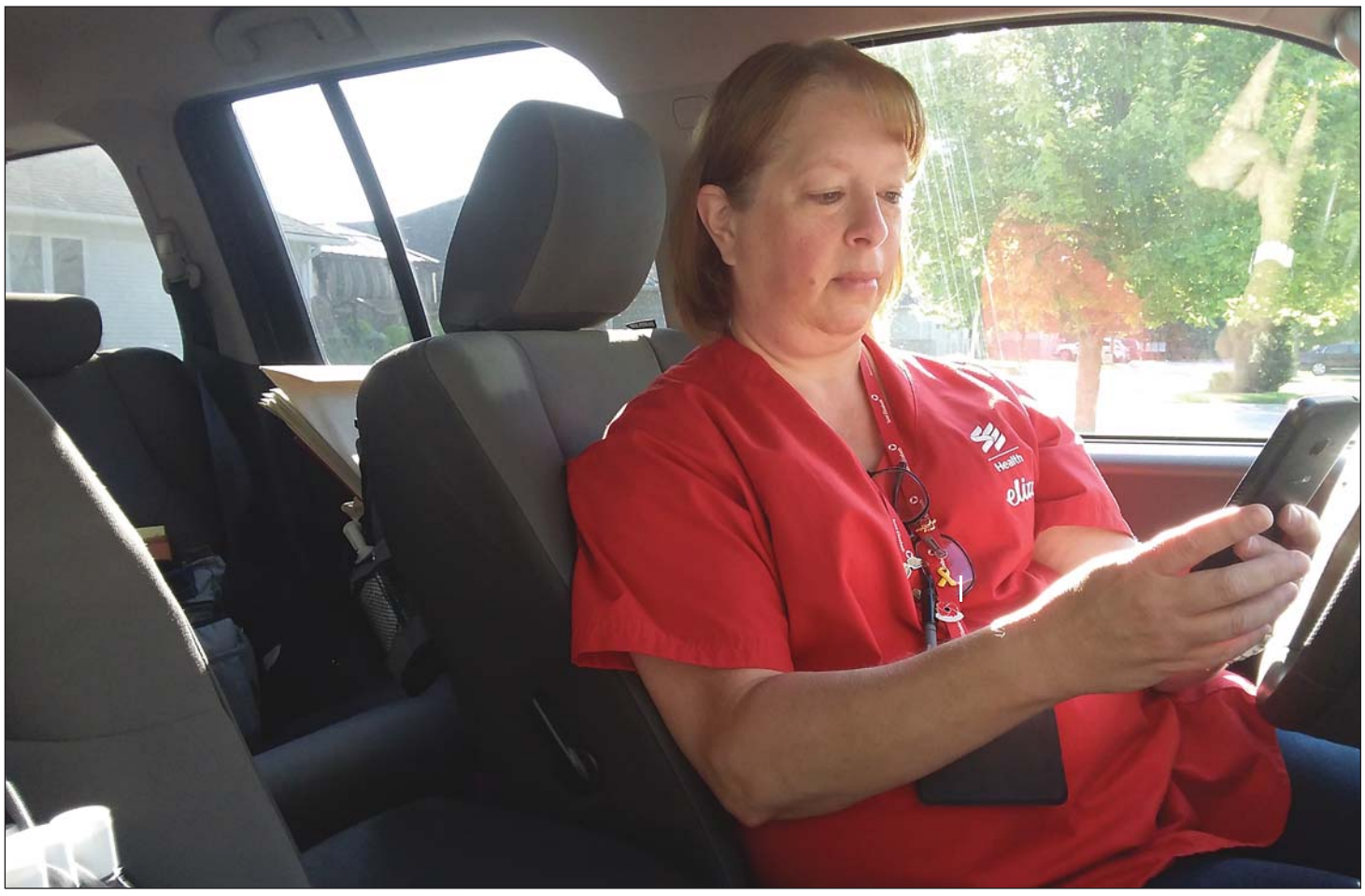

PHOTO: SE HEALTH

A home-care app for nurses, created by nurses

SE Health has created an advanced app for its visiting nurses that pulls information from a variety of sources in real-time. It provides the care-givers with virtually all the information they need. Moreover, it was created in partnership with the nurses themselves. Pictured above is Barb Gerryts, an SE Health Registered Nurse who delivers care in the Niagara region and is part of the co-design team. **SEE STORY ON PAGE 6**

CHUM recognized as Canada's smartest hospital

BY NORM TOLLINSKY

The Centre Hospitalier de l'Université de Montréal (CHUM) was recognized earlier this year as Canada's most innovative hospital in a ranking by the U.S-based magazine Newsweek of the world's top 250 Best Smart Hospitals for 2021.

Twelve Canadian hospitals made the list with CHUM finishing in 56th place, followed by Toronto General, The Ottawa Hospital, Mount Sinai Hospital, North York General and Vancouver General all placing in the top 100. Eighty-nine of the 250 hospitals were in the United States, including the three top ranked hospitals: the Mayo Clinic in Rochester, Minnesota, Johns Hopkins Hospital and the Cleveland Clinic.

The ranking was based on innovations in digital surgery, digital imaging, artificial intelligence (AI), telehealth and electronic medical records.

CHUM finally completed construction of its massive four million square foot downtown campus earlier this year. Built at a cost of $3.6 billion, the hospital boasts 772 individual patient rooms, 39 operating rooms and 65 outpatient clinics. It cares for approximately 500,000 patients annually and employs 17,000 people.

> **CHUM made a conscious decision five years ago to innovate and to improve its performance.**

"We were surprised and happy about our ranking, but to be honest, it's the result of a corporate decision we made five years ago to have an approach to innovation with a view to continuously improve our performance," said CHUM president and CEO Dr. Fabrice Brunet.

Deploying innovative technologies at CHUM goes hand-in-hand with measurement to confirm a positive impact on efficiency and patient care, not only in the department the technology is intended for, but also in other departments.

"For example, we used an AI tool to improve the flow co-ordination of patients in our OR and had an increase of 15 per cent, but we wanted to know at the same time what the impact would be on the Emergency Department and the medical specialties. This is something that is rarely done. Usu-

CONTINUED ON PAGE 2

Newsweek magazine recognizes CHUM as Canada's smartest hospital

CONTINUED FROM PAGE 1

ally, we just measure the benefit to the department in which the innovation has been implemented, but sometimes you can have deleterious side effects on other activities, and in that case, the global benefit is not the same as we expected."

CHUM began working to develop the teams and infrastructure for telehealth 10 years ago, so everyone was trained and ready when virtual care and remote monitoring were required to cope with the pressures of the COVID-19 pandemic.

"We dramatically increased our use of telemedicine," said Dr. Brunet. "We follow patients with cardiac disease, neurological disease, cancer, mental health patients and women with at risk pregnancies. We provide them with IoT connected devices and monitor their status through our co-ordination centre.

"For example, a patient who had cardiac surgery leaves the hospital after five days and goes home. If there is a problem with the wound after seven to 10 days, a picture is taken and sent to our co-ordination centre, where we either reassure the patient that it is nothing to worry about, arrange a consult with a nurse practitioner, or ask the patient to return to the hospital."

The Ottawa Hospital, which placed 79th in the Newsweek ranking, also used virtual care extensively during the height of the pandemic, noted Dr. Alan Forster, vice-president of information and quality. "Patients who have undergone surgery are being discharged early and receiving post-operative care at home with vital sign monitoring. We have also done that with COVID patients. We send them home, we monitor them from afar and can access escalation of care to a physician or have them come back to the hospital to be readmitted if necessary."

Virtual care is also offered within the hospital, allowing doctors and nurses to observe and interact with patients using cameras and vital sign monitoring devices. "It doesn't replace the personal care of a nurse going in, but it does complement it," said Dr. Forster.

CHUM has concluded that commercially available electronic medical records are deficient in not being able to capture data on the patient's clinical pathways before and after hospitalization, so it is working with hospitals around the world to develop a personalized patient electronic record that employs AI to correlate different sources of information.

Dr. Fabrice Brunet

Dr. Alan Forster

"Most of the EMRs today are very structured, which means there is a lot of data that you cannot insert into the medical record," explained Dr. Brunet.

"Let's say you have a patient with diabetes. The patient comes to the hospital and has different investigations and treatments that are recorded in the EMR, but then the patient returns home. Connected devices measure his glycemia and weight, and transmit data to our hub, but it can't be added to a conventional EMR because it's not structured for that.

"So, if you want to understand why a patient is worsening or having an episode, you will miss this information. Our hub will collect this information and add it to our data lake, along with the data from our EMR. Then the deep learning machine will make the connection between what happened before, during and after the patient's hospital stay."

Dr. Forster, who served as a member of an expert committee advising Newsweek on the criteria for ranking hospitals, credits the Ottawa Hospital's implementation of an Epic EMR for facilitating its transition to virtual care technologies.

"We were just getting used to it in January when COVID came around and in March [2020] we had to do this major shift. Epic went from being 'I can't believe we did this' to 'thank God we did this.' It has been a major benefit to our organization. Having a digital platform with a single EMR allows us to integrate other systems as required."

In addition to innovations in telehealth and digital records, CHUM is at the forefront of pioneering AI and robotics. AI, for example, is used in imaging to diagnose cancer with the help of data from other sources when the image itself is inconclusive. It's used to detect seizures, cardiac failure, at risk pregnancy and mental health disorders, including suicide risk.

Robotics are used in surgery, in CHUM's labs and in the hospital's pharmacy. Networked bedside terminals are used to interact with patients, provide them with information, connect with family, surf the Internet and watch movies.

While the Ottawa Hospital's Dr. Forster would like to see Canadian hospitals rank higher, he cautions that "any ranking is open to interpretation, especially when they are based on subjective opinions."

Innovation, he said, may indeed be more difficult in Canada's publically funded model of healthcare, but is quick to add, "the Canadian system is quite strong and has benefits that the American system doesn't have."

Dr. Brunet, on the other hand, doesn't think it's more difficult for hospitals to innovate in Canada because they are publicly funded.

"Whether you're publically funded or privately funded, you always need to demonstrate that the innovation you want to implement will improve or increase the value of your organization. Sure, we need to keep to a balanced budget, but innovation can help you improve efficiency."

CANADIAN Healthcare Technology

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

Volume 26, Number 6 September 2021

Address all correspondence to Canadian Healthcare Technology, 1118 Centre Street, Suite 204, Thornhill ON L4J 7R9 Canada. Telephone: (905) 709-2330. Fax: (905) 709-2258. Internet: www.canhealth.com. E-mail: info2@canhealth.com. Canadian Healthcare Technology will publish eight issues in 2021. Feature schedule and advertising kits available upon request. Canadian Healthcare Technology is sent free of charge to physicians and managers in hospitals, clinics and nursing homes. All others: $67.80 per year ($60 + $7.80 HST). Registration number 899059430 RT.

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Made For life

Human resources were key ingredients in building new smart hospital

BY JERRY ZEIDENBERG

VAUGHAN, ONT. – Mackenzie Health opened its second site, the Cortellucci Vaughan Hospital, north of Toronto, as a full-service hospital in June. The hospital, with capacity for up to 350 beds, has the ability to expand up to 550 beds, and it's already one of the most technologically advanced medical centres in Canada.

Uniquely, it features a smart network that "anticipates" the needs of patients and clinicians. Other advanced technologies include real-time locating systems (RTLS) for equipment and people, and devices such as infusion pumps that are electronically connected to the patient record system.

However, while the network and hospital were powered up in an instant with the flip of a switch, the opening of this "smart" hospital actually required about a decade of thinking, testing and training.

"It all started in early 2010 and 2011, when we were challenged by fiscal issues," said Mackenzie Health's president and CEO Altaf Stationwala, who participated in a webinar about the launch of the hospital that was sponsored by GetWellNetwork, the company that supplied the bedside patient engagement system offering access to the Internet, patient records and images, education and entertainment.

"We started thinking about a redesign, and we relied on the ideas of our front-line staff."

In the process, Stationwala explained, the hospital implemented a new electronic health record system – the Epic Health system – and became Canada's first end-to-end Epic hospital, one with a full range of service. It also emerged as the country's first full-service hospital with a HIMSS EMRAM Level 7 ranking, the highest on the EMRAM scale.

Throughout the webinar presentations, Stationwala and his colleagues, executive VP Richard Tam and CIO Dr. Aviv Gladman, emphasized that the support and active participation of staff and clinicians were crucial to the success of the creation of the modernization efforts – both at the existing hospital in Richmond Hill, Ont., and at the newly opened facility in nearby Vaughan.

"HR is the most precious commodity that we have," said Stationwala.

But the staff had to become aware of the benefits of the re-engineering work; they would be required to do things in new and different ways, so they'd have to adjust their work habits and ways of thinking.

"It was all about our staff and change management, and how they understood the benefits of what we were doing," he said.

Dr. Aviv Gladman, the hospital's CIO and an ICU physician, observed that 10 years ago, when this process began, nobody knew what a "smart" hospital even was. "Even today, many can't answer the question, and we're still being asked, 'what is the point?'"

He explained that the investment in smart technologies is all part of the quadruple aim of improving the patient experience, the provider experience, improving clinical outcomes and reducing overall costs.

Underlying this effort are several major building blocks, including a very robust network, effective electronic records, a unified communication system, and a real-time locating system.

"The RTLS is really an activity-based service," he said. "It anticipates what someone is trying to do and anticipates problems before they happen."

The system senses, for example, when clinicians enter and exit patient rooms. Their hand washing activities are monitored by the sensors at hand hygiene stations, and reports are created at each shift, serving to prompt them to wash their hands before and after touching patients.

We know, of course, that handwashing is the most basic foundation of good healthcare; the system assists with hand hygiene compliance.

On another front, the system will be able to detect when patients need pain medication, faster than before, so that it can be delivered more quickly to suffering patients.

These are all components of the "smart" hospital.

As well, virtual care has emerged as a major ingredient in the healthcare mix at Mackenzie Health, just as it is in other centres. The COVID-19 crisis had much to do with it.

> **"HR is the most precious commodity that we have," said Mackenzie Health's President and CEO Altaf Stationwala.**

Before the new site opened as a full-service hospital in June, it was operated as a COVID-19 hospital – starting in February 2021 – to help relieve the pressure on other hospitals. Over 500 patients were transferred from other hospitals during a four-month period.

During that time, Mackenzie Health operated a "virtual" COVID-19 clinic, enabling remote assessments of patients who might have contracted the novel coronavirus.

"This resulted in 850 prevented admissions and the savings of $8 million," said Dr. Gladman.

The work with COVID-19 patients, and infection control, spurred a great deal of virtual care, with the hospital caring for patients in their own homes through the use of remote technologies.

"Virtual care had already started before COVID hit, but it accelerated because of the pandemic," said Dr. Gladman. "We were well-positioned technologically, and our goal was a hospital without walls."

Dr. Gladman said remote monitoring will continue after the pandemic ends. The new systems will be critical for this purpose: "We're using workflow automation and rules to manage the patients, without relying on people," he said. "Otherwise, it's too much data to manage."

Automated systems can monitor patients, sending alerts to doctors, nurses and other clinicians when human attention and intervention is needed.

He noted that some patients and visits don't fit the virtual model, and in-person care is really needed. As well, video is not always required for virtual care. "Some patients want just a phone visit," he said.

Richard Tam emphasized the need for testing and training when building a smart hospital. He noted that when the modernization effort began at Mackenzie Health, an "innovation unit" was created, consisting of an actual unit in Mackenzie Richmond Hill Hospital.

There, the new systems could be tested and modified. One smart solution, he recalled, consisted of software that would automatically handoff the care of patients between nurses as they ended and started shifts.

"They didn't have to remember to give a phone to the next nurse on the shift," Tam said. "The system would automatically reroute the calls to the new nurse's phone."

Another benefit of this system was unexpected. Without the overhead alerting system, there was less noise. "The patients and visitors noticed that it was calmer on the floor, and very quiet – unlike most other hospitals. That was an 'aha' moment."

When talking about lessons learned in designing and building a smart hospital, Tam had some words of advice. First, he may have to be altered or tweaked – or even completely revamped – to work properly.

He said a real focus of both Mackenzie Health hospitals will be on eliminating "never events", those events that should never take place to patients in a hospital – such as falls or surgical infections.

"That will be version 2.0 of the smart hospital," he said. In jumping to this level, he said more intensive partnerships with vendor teams will be needed.

When it comes to vendor relations, and the healthcare system in general, Stationwala had his own advice. Not only has he been deeply involved in the planning and creation of smart systems at Mackenzie Health, but he has observed the activities of other hospitals and has advised many of them.

Just as hospitals rigorously assess vendors, he said that solution providers should be careful about diving into projects without assessing the readiness of the hospitals.

"Vendors should be vetting healthcare organizations to ensure they are ready and set up for success from a human resources and change management perspective. Without this foundation, we've seen implementation can be very challenging and more likely to fail," Stationwala said.

For its part, Mackenzie Health conducted years of regular training and information sessions for staff, clinicians and patients. And it implemented the new electronic records system years before it embarked on the construction of a new hospital.

"We deployed the new EMR five years before building the new hospital," said Stationwala. "We knew that we couldn't do both projects at the same time."

Altaf Stationwala, President and CEO

Richard Tam, Executive VP

Dr. Aviv Gladman, Chief Information Officer

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New app for visiting nurses was co-designed by the nurses themselves

BY SARAH QUADRI

Linda Keirl, a Windsor, Ontario-based Registered Practical Nurse (RPN), is living her best life. She's getting the right information securely, in real-time, and delivering exceptional care and service to patients in their homes.

Her longtime employer, SE Health, a not-for-profit social enterprise and one of Canada's largest home-care organizations, is helping her to do that.

The organization recently launched a new app and digital platform, MySE Life, that is making it easier for Keirl and her colleagues to keep doing what they love: bringing hope and happiness while working with purpose and helping each client to realize their most meaningful goals for health and well-being.

"It's my SE life on my mobile phone and it's as simple as it sounds," said Keirl, who claims she is "far from tech savvy" and has been nursing for almost five decades.

She has called SE Health home for close to 20 of those years – after she was inspired by the organization's "wonderful palliative care delivery that is client and family focused" and wanted to give that same experience to her clients.

"This amazing app has my entire client caseload and their information, including addresses, medical and visit history, and treatment plans, all in one place – and it's very user-friendly," said Keirl. "As a frontline RPN, I'm thrilled to be part of a co-design team that's allowing us to reimagine client-centered care in new and innovative ways to promote the continuity of care for our clients and families."

While other apps and programs for visiting nurses may contain patient information in digital form, MySE Life differs in that it pulls real-time information from a variety of databases, including SE Health's own patient records and the public health system, such as Ontario's community health system.

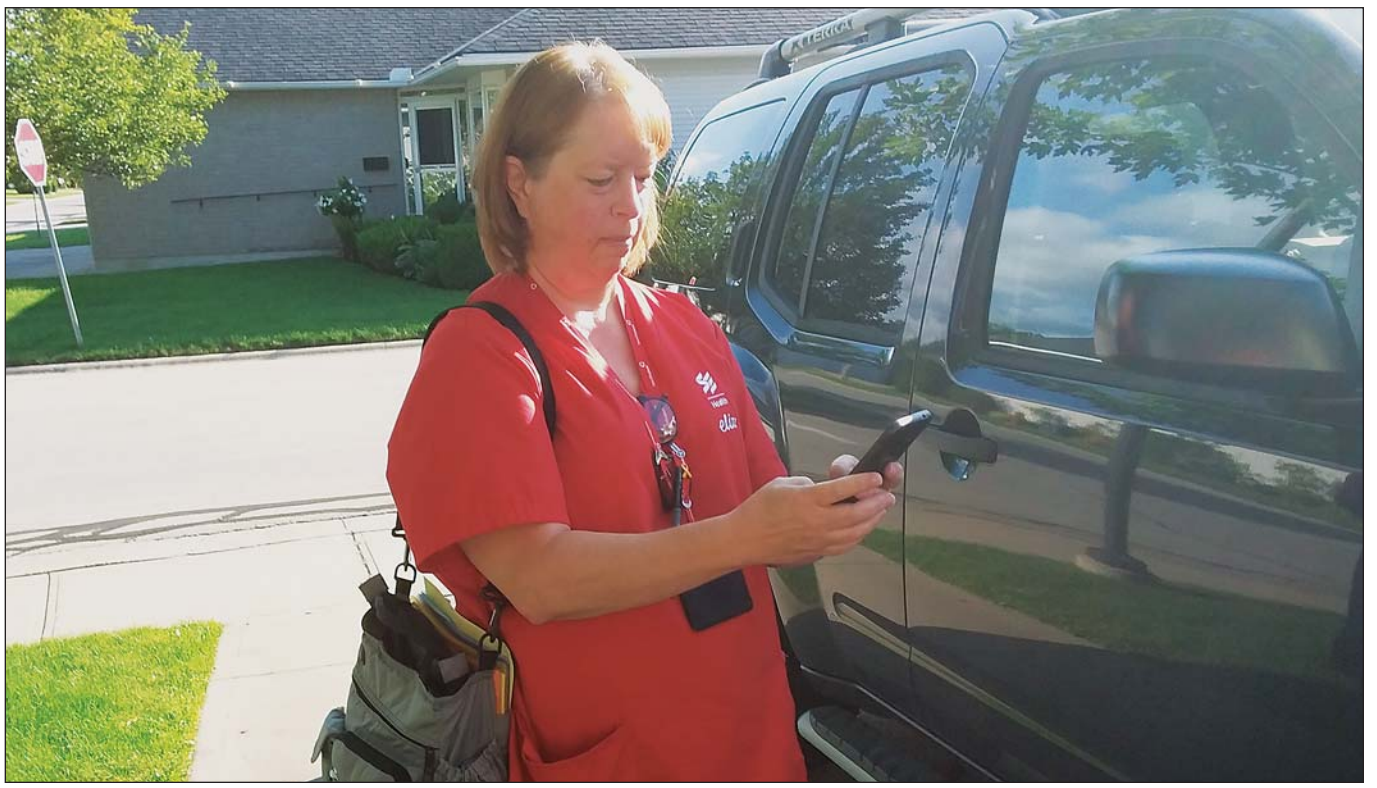
Planning for the application began last year, during the first wave of the pandemic. Microsoft Teams enabled several SE Health groups, including digital transformation and operations professionals, as well as nurses, to form one team and to explore and understand how nurses are delivering care.

They discussed the tools they have and those they didn't have but needed. They also outlined how care could be enhanced for clients and nurses at the same time – for example, by cutting down the number of emails nurses receive and by maximizing the use of new and leading-edge digital tools and practices.

Before the introduction of the application, nurses received their caseload information weekly by email. It was a lengthy PDF document containing their schedules and numerous important details about their clients.

The information was auto-generated and it wasn't always up to date in the ways it needed to be. It would also take nurses many hours to read. Getting up-to-date information, in a format that was easier to read and understand, was a priority.

This was another important feature delivered by MySE Life.



Barb Gerryts, SE Health Registered Nurse.

"Empowering our nurses in this exercise was important for two reasons: engaging our people and showing our confidence in them, and ensuring the success of the application itself," said Nancy Lefebre, SE Health's chief clinical executive and senior vice president Knowledge and Practice.

"It also supports our new model of care at SE Health that takes us back to our foundations of caring where nurses are autonomous leaders and are supported by their incredible teams in a primary nursing model."

She added that the pandemic continues to show us that home is the safest and best place to be and that people want to live and die at home. SE Health is committed to listening to its employees and giving them the tools they need.

Empowering nurses to participate in the app development ensured the success of the project.

"The co-design of this application makes this endeavour exceptional in every way," said Arslan Idrees, chief digital transformation officer at SE Health. "From start to finish, we are following the design principle 'for nurses, by nurses,' right down to the descriptions and names.

"Utilizing new, cutting-edge UX [user experience], we are connecting the legacy infrastructure with the new 21st century experience, putting the legacy technology behind the curtain to allow SE Health to lead in the digital world. Even better, we are giving the nurses an 'Uber-like' experience without changing the back-end ecosystem and we've done this at lightning speed."

Typically, as Idrees continued, an organization would "purchase software and adjust people and processes to fit a solution."

But in this case, the end users (nurses) are "driving the vision of the application. And clinical and technical staff are working together in an agile manner to reimagine the future with incremental releases, allowing the application to improve their daily lives.

"The co-design opportunity is like magic," added Barb Gerryts, SE Health Registered Nurse who delivers care in the Niagara region and is part of the co-design team. "During our meetings with the development team, we put together 'wish' lists. We kept the suggestions coming and the development team kept saying "yes!"

"We even had input into the font design and size," she added. "As a small group of nurses, we come to the table with the same profession but with different points of view and geographical locations. One of our goals was to leverage that location piece and create an app that works well in all communities.

"We also quickly saw the importance of combining our daily service plan with our caseload plan and getting the information in one place on nurses' phones so it is easy for us to navigate."

Before the app, nurses would have to go to a different app or location to find a family physician's telephone number, to read the history of their client, to look for details about the client's last visit or find the client's address. Now, that's all changed.

"It's in real-time," exclaimed Gerryts with excitement. "If I make a change to my day, it's live and the updates have been made. It used to take one or two hours for the information to show up previously. It's already helping us to work smarter. The information has been in so many places but the app brings it all together."

"It's making my life easier and I'm safer on the road as a result. I am also feeling more involved in my day-to-day tasks," said Allison Hanchett, SE Health registered nurse in North Simcoe-Muskoka and part of the co-design team.

"This feeling enhances care for our clients because we know that we can positively make changes and then see the changes that are being made. I feel so lucky to have been chosen as part of this group to offer input and to make a difference. The app is modernizing home and community care and it's liberating to make these changes during challenging times when we couldn't meet in person. It makes me feel like anything's possible."

Idrees noted that the MySE Life provides the information that nurses need on-demand, and that everything has been designed for the small screen – the smartphone. "Nurses are seeing everything scaled to their phones, always with the most relevant information, such as the client code, showing first. It also works in offline mode," he said

Now that the application is up and running – available to all SE Health nurses since the end of July – Idrees says "by decoupling the legacy infrastructure from the front end, it's allowing us to realize our goal faster, without losing continuity. This 'fit-for-purpose' approach will enable us to continue innovating while the infrastructure catches up, enhancing care for our clients at every turn."

For Keirl and her colleagues, they are already providing feedback on the second iteration of the application and are thrilled with the possibility of SE Health expanding this type of initiative to include other staff, in the areas of Personal Support Care and Rehabilitation, in the future.

"I'm so proud to work for an organization that's listening to its people and building trust with us every chance they have," said Keirl. "As nurses, we've been involved from the ground up and SE Health wants us to feel confident and comfortable with the app; they are supporting teams through training and at every stage of implementation. This is truly my SE life and I can't wait to see what's next."

Sarah Quadri is Director, Corporate Communications, at SE Health.

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Expanding a health-tech company can be done in a variety of ways

BY JERRY ZEIDENBERG

TORONTO – It's not easy to grow a successful technology company in the healthcare sector – purchasing cycles are notoriously long at hospitals and other medical centres. And often enough, entrepreneurs have difficulty just getting a foot in the door.

In a session aimed at helping innovators open those portals, a panel of entrepreneurs and a hospital executive commented on different strategies for success during an online discussion at the MaRS Impact Health conference in June.

Jennifer Sheils, chief information officer at Horizon Health, in Saint John, N.B., said that selling to healthcare organizations has traditionally been challenging, but that recently, things have changed. "We've had some disruptors, like COVID," she said. "Our risk tolerance has changed. There's a new appetite to engage with industry."

That's because the pandemic forced healthcare organizations to go virtual as soon as possible. For a while, going online was the only way to deliver services safely. And many healthcare facilities could only do it with the assistance of tech companies as partners.

Now, healthcare facilities across Canada are more open to allying with the private sector, including young and innovative companies, to implement new technologies.

Significantly, Sheils mentioned that a growing number of healthcare organizations are joining the CAN Health Network (https://canhealthnetwork.ca/), which links healthcare facilities with entrepreneurs to help them refine and scale their innovations. Once they've proven themselves with a few hospitals, the network then helps them grow even further, connecting them with additional members.

As the companies have already been vetted by hospitals, and the innovations have been shown to be reliable and useful, it's easier for innovators to make additional sales to other members of the network.

Sheils noted that Horizon Health itself recently joined the CAN Health Network. It will be working with entrepreneurs to validate new technologies and solutions and to help entrepreneurs grow their businesses. "We're enabling direct access to our clinicians," she said. "We will then support and handhold our customers throughout our network."

In Atlantic Canada, there are eight other organizations that have joined the CAN Health Network; Sheils and Horizon Health are acting as the leaders in this region and will be actively fostering the rise of local companies. Innovators will be directed, as well, to other hospitals and healthcare organizations across Canada.

"It's the first national project and approach of its kind," said Sheils, referring to the effort of nurturing and promoting technology companies in conjunction with the healthcare sector. "In Atlantic Canada, we've leveraged learnings from Ontario and the Western edge."

The CAN Health Network has members in Quebec, Ontario, northern Canada and the West. They include Vancouver Coastal Health, the Saskatchewan Health Authority, Trillium Health Partners, the University Health Network, Horizon Health and the Vitalité Health Network, the Francophone health system in New Brunswick.

Meanwhile, another panelist, James Bateman, CEO and founder of Medchart, described another way of growing a Canadian tech business: expanding to the United States.

While doing a PhD at the University of Toronto, Bateman launched Medchart in answer to a nagging problem – how to consolidate the medical records of patients that are scattered in different places. Bateman and a partner created a method and platform for bringing records together and making them easily accessible to patients, as well as their families and caregivers.

Of late, the company has also been working with legal firms and insurance companies that need access to patient records, with permission from the patients and their families.

While the company grew steadily in Canada, after creating an office in Dallas, business skyrocketed. "In the last year, we went from 50 employees to 150," said Bateman. "Eighty percent of our business is now led by U.S. customers."

Indeed, many entrepreneurial experts maintain that to quickly grow a business, Canadian start-ups should expand to the U.S. as soon as possible.

"For us, when we started in 2016, we were told that it's never too early to work in the U.S.," said Bateman. "It's a heavy lift, but it's worth it."

He said the team decided on Dallas as a U.S. headquarters because of its central location. "FedEx and Amazon are here, because everything funnels through Dallas … If you do anything coast-to-coast, it really makes sense."

While expanding to the U.S. can lead to growth, it's not always necessary, stated Michael Wilson, CEO of Edmonton-based DrugBank. That's especially true if a business is web-based, like DrugBank, which is an online database that provides a wealth of information about drugs, including drug-to-drug interactions. (https://go.drugbank.com/)

"You don't have to be in the United States," said Wilson, "thanks to virtual tools," such as Zoom and Teams. He said that DrugBank has had "incredible scaling" recently, with business done around the world using virtual meetings.

James Bateman, CEO of Medchart

Jennifer Sheils, CIO, Horizon Health

Michael Wilson, CEO, DrugBank

"We have customers in 20 countries, with most of them in the United States and Europe." While DrugBank makes a large portion of its data available for free online, full versions of the data for more intensive users require paid licences. As well, the DrugBank database can be integrated with an organization's own solution through the use of an API, under licence. It is these users, including research facilities, who have powered the growth of the company, which was spun-off in 2016 from the University of Alberta lab of Dr. David Wishart.

"With virtual meetings, it's easy to get connected with people," said Wilson. "That includes Canada, which is a big place."

VR enables diagnostic-imaging professionals to share patient's experience

BY BEN MAYCOCK

A study published in the Journal of Medical Imaging and Radiation Sciences suggests that the use of virtual reality (VR) may be effective in eliciting empathy in medical radiation technologists (MRTs). Researchers concluded that VR may provide an effective tool for healthcare workers to experience the perspective of care recipients.

"As Medical Radiation Technologists, we are interested in the intersection of care and technology," said lead author Megan Brydon, picture archiving and communication system (PACS) application specialist in diagnostic imaging at IWK Health, in Halifax. "We started this project in 2019, pre-pandemic, and now the idea of learning empathy in a virtual environment has taken on a new relevance."

Researchers looked at studies investigating VR experiences in immersive VR environments, where participants assumed the role of a care recipient, and non-immersive VR environments where the participants assumed the role of a care provider in a simulated care setting.

The two types of studies helped researchers gain an understanding of what it is like to have a specific disease or need and to practice interacting with virtual care recipients.

"The wonderful part of research is that is lets us bridge the gap between an idea and reality," said co-author Jessica Kimber, a CT/IR/general imaging technologist at IWK Health. "Through this project, we were able collate a lot of data to determine that virtual reality can elicit empathetic behaviours in a variety of settings and with a range of patient experiences."

> **VR is helping technologists to empathize with patients in the diagnostic imaging and radiation departments.**

Research has shown that empathy, the ability to put oneself in the shoes of another, gives healthcare professionals the ability to provide appropriate supports and results in making fewer mistakes.

It also helps increase patient satisfaction and enhance patient outcomes, resulting in better overall care.

Empathy is essential to patient-centered care and crucial to the development of therapeutic relationships between carers and care recipients. Currently, there is a need for the development of effective tools and approaches that are standardizable, low-risk, easily repeatable, and could assist in eliciting empathetic behavior.

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Virtual solutions, pharmacists enhance clinical care for First Nations

BY GLENYS VANSTONE

While government and private health plans often include coverage for prescription medications, there is virtually no funding for comprehensive clinical care by pharmacists.

Seeing the lack of these services in many isolated, First Nations communities in Canada, The North West Company (NWC) decided to step in and make a positive, progressive difference.

Several healthcare banners of NWC joined forces in 2021, endeavouring to improve health literacy and diabetes care for Indigenous individuals, starting with the community of Cross Lake, Manitoba.

Kevin McDonald, director of North West Telepharmacy Solutions (NTS), said: "As many Canadians with chronic conditions are on multiple medications, it is the knowledge of pharmacists that is going to really make the difference to the healthcare system and for patients. Pharmacists are able to optimize pharmaceutical care, and for people in remote communities, this is a service that is clearly needed."

The venture involves a virtual pharmacist with the NTS banner partnered with NWC community pharmacy retailer North Mart Pharmacy. Together, they're proving medication management reviews and remote follow-ups for the diabetic patient community of Cross Lake, Manitoba.

Cross Lake is a Cree First Nation reservation with a population of approximately 8,000. As of today, studies suggest eight out of every 10 individuals in First Nations communities will develop diabetes in their lifetime.

Patients who have an appointment with their family doctor in Cross Lake are identified by nurses in the clinic about a week beforehand. They are offered the chance to speak with the virtual pharmacist from NTS about their medications before visiting the doctor.

By the time the patient goes to see the doctor, the pharmacist has already made suggestions for improving therapy.

"There is a huge opportunity to stop medications that may no longer be necessary", says Glenys Vanstone lead virtual pharmacist with NTS for this initiative. "A medication that may have been the right choice when the patient is 50 may be causing side effects and problems when they are 65. This process is called de-prescribing".

Furthermore, an encounter provides an opportunity to inquire about smoking cessation and stress management. Many interventions have involved smoking cessation counselling, smoking cessation medication starts, and follow up.

Once the medication review is completed and a document is sent to the clinic office and pharmacy, the community pharmacist may follow up on any outstanding recommendations, including addressing smoking cessation support, blood pressure monitors and glucose monitoring.

In several cases the community pharmacist has offered alternative solutions or recommendations to drug-related problems identified by the medication review.

The community pharmacy has found the medication review program to be over all positive for their clients.

So far, the feedback from clientele has been very positive. Some comments include:

"I'm really glad you called me. I didn't know what my medications were for. Now I feel okay to take my medications."

"I really like the questions you ask; you are right on – really awesome pharmacy we have here in Cross Lake."

"No one has every talked to me like this about my health before."

Amdocs (a banner of NWC that provides physician care to remote communities) medical director, Dr. David Folk, said "There is so much need for comprehensive healthcare services in the northern communities. The opportunities of a collaborative care model with pharmacists and physicians is tremendous for the care of patients. It is wonderful to finally have the technologies and acceptance to run this virtual care program in Manitoba – and hopefully into northwestern Ontario soon".

For its part, NWC is collecting results regarding patient satisfaction and quality of life, medical team satisfaction, community pharmacy satisfaction and the overall benefit of the medication review program.

Zoom and Teams dominate virtual platforms for healthcare in Canada

Across the globe, COVID-19 forced provider organizations to explore new ways to safely meet with and care for patients. While regulations may shift in the post-COVID world, most countries are unlikely to roll them back completely, meaning telehealth is here to stay. For this study, titled "Global (non-US) Virtual Visit Solutions 2021," the healthcare-technology market research firm KLAS interviewed 113 organizations outside the US about their current state with and future plans for virtual visit technology.

90% have adopted virtual visit technology, and in total, they mentioned using or considering the commercial video visit platforms, public telehealth platforms, or video conferencing platforms of 56 different vendors. At the onset of the COVID-19 pandemic, organizations rolled out technology in a matter of weeks, and most plan to re-evaluate these solutions in the near future. What types of platforms and which vendors are being used and considered most often?

Microsoft Teams and Zoom are the most broadly adopted solutions overall and were the solutions most commonly adopted in response to the pandemic. Many organizations already had some degree of familiarity with these platforms, facilitating quick rollout for out-patient/follow-up visits or for telespecialty consults.

Microsoft Teams has a particularly strong presence in Europe and the Middle East, while Zoom has gained most of their non-US traction in Canada. Both platforms have recently made progress with functionality and integration and are likely to continue being adopted.

Healthcare organizations also implemented other video conferencing solutions like Cisco and Google Meet, though to a lesser extent. Telehealth platforms made available through regional public health authorities – such as Attend Anywhere in the United Kingdom and Ontario Telemedicine Network (OTN) in Ontario, Canada – have been frequently deployed in the regions where they are offered.

However, scalability or functionality challenges have led to some replacements. Teladoc Health received more mentions than any other non-EMR virtual care platform (they were brought up in three different regions). MEDITECH and Philips were the most frequently mentioned EMR-centric virtual care platforms. 39 other vendors were mentioned (as in use or considered) by just one interviewed organization apiece.

Of the types of virtual visit technologies measured in this report, EMR-centric virtual care platforms are least often used or considered. In lieu of waiting for EMR vendors to develop integrated offerings, most healthcare organizations opted to roll out already available video conferencing platforms, non-EMR virtual care platforms, or region-specific public platforms.

However, many EMR vendors have since released virtual care platforms in response to the pandemic, and organizations are taking note (though often not yet adopting). Of the 10 MEDITECH EMR customers in this sample, 4 use the vendor's virtual care platform, and 1 is considering it.

> **Both Teams and Zoom have recently added new functions and integration features, and will likely see increased use.**

Of the 16 Cerner Millennium customers, 2 considered but did not select Cerner's virtual care platform, and 1 of the 9 Epic EMR customers considered but did not select Epic's virtual care platform. A number of regional EMR vendors were mentioned once apiece: Adaptive TechSoft, ChipSoft, CompuGroup Medical, Dedalus, Maincare Solutions, Philips, and YASASII. Among interviewed organizations who are using an EMR-centric platform, 83% plan to stay. As organizations using any platform type re-evaluate their long-term plans, they intend to give more consideration to EMR-centric platforms, particularly for the benefits of tighter integration.

Ontario Telemedicine Network (OTN), Ontario's provincial telemedicine platform, predates the pandemic and suffered from significant performance issues when usage ramped up because of COVID-19. As a result, regulations were relaxed to allow healthcare organizations to use other platforms for virtual visits. Many quickly opted for cross-industry solutions like Zoom, mainly for its low price point and the ability to set up EMR integration. According to the KLAS report, Microsoft Teams was also widely considered, though less often adopted because of cost concerns or the perception it wouldn't meet needs (e.g., integration).

Other Canadian provinces also relied heavily on cross-industry solutions (including Cisco). MEDITECH Expanse customers often looked to MEDITECH's integrated portal offering to meet their virtual visit needs. This adoption in Canada makes MEDITECH the most widely used or considered EMR-centric platform in this research sample.

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

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

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

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

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

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

The XERO/Microsoft Teams app can save valuable time over the course of a week, month or year. Agfa HealthCare estimates that with a time saving of 10 minutes per consult, an average hospital could save 75

days of productive time per year. The app can also be life-saving, if a patient has COVID-19 and needs to be placed in quarantine before infecting someone else.

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

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Panelists say EHR, healthcare in general, are facing drastic changes

BY JERRY ZEIDENBERG

Healthcare systems around the world are on the verge of a redesign. And if we in Canada want to improve the health of our populace, we're going to have to keep pace.

That will involve a radically different way of thinking about health.

"We're stuck in this paradigm of the patient visit, where everything is about the visit," said Zayna Khayat, PhD, a panelist who participated in a June webinar entitled, "Maintaining Human Connections in our Increasingly Virtual World."

The webinar was sponsored by TELUS Health and included Dr. Dominik Nowak, a family physician and chair of the TELUS Medical Advisory Council, and Daniel Martz, Vice-president of Virtual Care at TELUS Health.

Khayat went on to say, "If you stop using the visit as the only thing that counts in healthcare, then the visit becomes a minor point in the patient's healthcare journey."

Instead, it's the social determinants of health that are important in the long run. But to a great extent, we're not tracking these elements in patient records or taking them into account during the delivery of care.

Khayat, a strategist with home care specialists SE Health, noted that this is going to change, and that we're going to be putting a great deal more work into addressing the social and environmental factors that determine a person's health.

Already, she commented, leading-edge systems in the United States like the Cleveland Clinic are building this approach into their business strategies. In addition to continually improving the short-term medical encounter, to improve the quality of care they're also addressing the foundations of health, such as housing, income levels, racism and other social problems.

Dr. Nowak pointed out that 80 percent of a person's health is directly related to social needs. "It's not your biology or genetics that count as much as the social determinants. It's your housing, food security, social connectedness and social purpose," he asserted.

Daniel Martz

Dr. Dominik Nowak

Zayna Khayat

Daniel Martz provided another way of looking at this problem. "In broad numbers, we spend $300 billion a year on healthcare in Canada, but only 10 percent of that is spent on the medical visit – so we're being myopic in focusing on this."

Martz noted that we should be paying more attention to nurses, social workers, case managers and orderlies. "All of these people make the visits happen," he said.

What's more, these are people who should be included "virtually" in the system, to enable better care through the use of technology.

Martz outlined the steps that can be taken to virtualize and improve the patient care process:

- We can create "virtual doorways" in which patients can obtain attention for their needs, medical and social. And they should be treated with empathy and compassion, right from the start.
- The public should be able to access a range of services once in the door, including preventative services, resolution of their medical and social needs, and monitoring of a broad range of chronic diseases.
- The entire experience, including medical and social interactions, should all be logged into a shareable, longitudinal record.

It's that record which is key, because it forms the "single point of truth" that can be accessed by teams of caregivers. Additionally, it's the patient who must own the record, and who must be able to grant permission to share it with others. "Those are the two enablers of team-based care," Martz said.

Khayat emphasized that in the future, the data that's contained in the electronic record will be much different than it is today. Only 10 percent of the data is likely to revolve around things like medications, lab tests, diagnoses and medical history. Instead, it will be made up of non-traditional sources of information, such as socioeconomic, genomic and environmental data.

This data will likely be analyzed by computers as well as people. Already, AI and machine learning systems are examining data collected in smartphones, something that most people use every day.

"We all carry a supercomputer in our pockets, the smartphone," commented Martz.

"I recently realized that all the steps that

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Whole person care builds on the momentum of virtual care adoption

BY DR. JOBY McKENZIE

Although the technology already existed to enable a more modern healthcare experience, the COVID-19 pandemic accelerated the adoption of virtual care and remote patient monitoring. This pivotal global moment opened minds to the impact technology can have on building a better healthcare experience and made virtual care a trusted, go-to approach for many.

A Canada Health Infoway survey found that seven in 10 Canadians turned to virtual care during the pandemic and 91 percent were satisfied. Virtual care wasn't created to replace in-person care. It isn't an "either/or" proposition but rather an "and." This hybrid model is the future, and it has the potential to support and augment health systems and care providers to everyone's benefit.

We simply can't let the elastic band snap back to the past. We must seize this momentum to invest in and establish systems delivery using a virtual whole person care approach.

This means moving beyond putting patients and medical providers on a screen together for a typical urgent care visit. Our path forward at Teladoc Health is to enable virtual care across a person's entire health journey supporting primary care, mental health and specialty care as well as chronic disease management, whether in hospital or at home. We leverage digital technology and harness data from health signal devices and apply machine learning/AI to deliver whole person care.

As a multinational healthcare technology company, our clients in Canada include large Canadian insurers and banks and we have been privileged to partner with them for decades to deliver health services through employer benefits and individual health insurance products. Amongst our hospital and health system customers, we are innovating with Vancouver Island Health Authority where we have evolved its health system utilizing virtual technologies.

Island Health's adoption of our Solo platform, branded as BC Virtual Visit, is an example of successful systems integration. In February 2020, Island Health began introducing its new app. The pandemic put it into overdrive. After one year, more than 4,500 staff and clinicians across 170 clinics and programs were on-boarded to BC Virtual Visit, conducting close to 28,000 virtual visits with patients across the region.

These visits included primary care appointments and prescription refills, community health services assessments and follow-ups, diabetes education sessions, mental health visits and specialist appointments.

The platform improved patient experience particularly for those with profound challenges and for whom travelling is exhausting. Overall satisfaction rates were 99 percent for providers and 98 percent for patients. Highest user groups were ambulatory care clinics, particularly in neurology and mental health and substance abuse. Access to mental healthcare is a need that has been amplified by the pandemic. A Teladoc Health survey shows that of the Canadians who sought mental health services during the pandemic, 40 percent would not have received it if virtual care was not an option. And 91 percent of those who did receive virtual care reported an improvement in their well-being with more than a quarter reporting a "breakthrough."

Dr. Joby McKenzie

This September, to complement our services which already include navigation guidance to help patients connect with mental health clinicians, we have launched myStrength. This new Cognitive Behavioural Therapy self-serve app allows users to access personalized mental healthcare on their schedule and provides expert support for a broad spectrum of mental health conditions, including anxiety, depression and bi-polar as well as coping tools for parenting, work stress, sleep and COVID-19.

MyStrength also provides virtual coaches who support achievement of goals through motivational interviewing, tailored content and asynchronous text messaging.

The federal government is investing $150 million in virtual solutions over the next two years knowing how important these solutions are to Canadians, to our health and for the sustainability of our health system. We look forward to contributing to the Canada Health Infoway Alliance and are proud to be included in this group to drive innovation to transform healthcare and empower people to live their healthiest lives.

Dr. Joby McKenzie is Managing Director, Teladoc Health Canada

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CANADIAN Healthcare Technology

Texas speeds access to images by switching to Agfa HealthCare's Enterprise Imaging

Images previously siloed in different repositories are now quickly accessible by radiologists and other physicians.

BY NORM TOLLINSKY

A year-and-a-half after the installation of an Agfa HealthCare Enterprise Imaging platform, radiologists at the University Health System in San Antonio, Texas, continue to benefit from significant efficiency gains and increased functionality.

The decision to abandon its previous PACS in favour of enterprise imaging was motivated by a desire to bring all in-patient hospital imaging together on one platform.

"The hospital's IT department complained that they had 30 to 40 vendors that all wanted to provide imaging services for specialties like dermatology, ophthalmology and cardiology," said radiologist Dr. Kal Clark. "There were also ultrasounds done in the ER by ER docs. Where did those images go? So, it was all about integrating those images and having one vendor. Now, the ER doc can see our images and we can see the ER doc's images, in a patient-centric context."

Indeed, radiologists and other physicians are now more easily able to access all types of diagnostic images, saving them time and eliminating the trouble it took previously.

In addition to the benefits of reaching the images they need, the Agfa EI system also offers radiologists some notable workflow enhancements. Dr. Clark cites the example of how Agfa EI helps with the reading of post-operative head CT scans or images of critical patients with bleeding in the brain.

In these situations, "We need to assess if the patient is better, worse, or the same," he explained. "The problem is that these patients are in the ICU and are fairly sick, so when they get scanned, they may not be able to co-operate with the technologist's instructions about how to hold their head straight. As a result, I'm comparing images of the head in different positions.

> **Radiologists are seeing a 20 percent gain in efficiency, some of which are made possible simply by accessing the right tools.**

"Agfa uses 3D registration to morph the second image into the same format as the first one, so it appears that both were scanned the same way. I don't have to do any mental processing to correct for the patient's change in orientation. I just click a couple of buttons."

The ability to look at images in different orientations also speeds up the interpretation of problem studies for which the radiologist is missing specific views. "With Agfa, it's just a couple clicks away to reconstruct that myself, whereas before it was kind of clunky. I had to call the tech and ask for the missing image. Now, it takes me 10 seconds. I don't have to make that phone call and wait. It was a headache. I don't have that headache anymore."

Overall, Dr. Clark estimates that radiologists are seeing a 20 percent gain in efficiency, some of which are made possible simply by accessing the right tools.

There are also some increased revenue opportunities for 3D reconstructions. "For example, if I want to see what the skull looks like in 3D, I can do a 3D rendering that some insurers will pay more for. Agfa has some built-in tools that allow you to do that. Before, I would have to launch a new application, a third-party tool. Agfa has integrated it into their system, so it's very accessible and quick to do. Before, I wouldn't have the benefit of 3D reconstructions because of the extra time it would take me to load up a new system."

Dr. Clark added, "Agfa has a richer framework that allows me to manipulate the images to do 3D reconstructions natively in the application, and it has some billing opportunities because it has lowered the threshold to attempt these types of analyses. Before, there was a hurdle."

Significantly, hanging protocols – the series of actions performed to arrange images for optimal viewing – are among the biggest sources of frustration with PACS.

Dr. Clark offers the analogy of trying to find a pen on a messy desk. "If your pen is over in the cup with all the other pens, you can find it very quickly. But many PACS are like a totally cluttered desk. You can't find anything, so every time you open a study, you have to search for the image you want to look at first and sift through the series or sub-components of the study to find what you're looking for.

"All of the PACS companies are competing on how to improve the radiologist's workflow and how to organize the desk so the radiologist can work faster. With Agfa, it takes me just 40 seconds to arrange all the images the way I want to look at them."

Dr. Kal Clark

Another aspect of workflow that concerns radiologists is the work list.

Currently, many PACS companies are content to list studies to read and to let the radiologist sort through and prioritize them.

Now, AI companies are taking advantage of the opportunity to automate the process, "spending massive amounts of money to reorder the work list," according to Dr. Clark. Even electronic health record companies are getting in on the act, using data from their systems to prioritize the sickest patients.

"Agfa EI is clearly built to be interoperable. Our Service reps have developed a curated list of AI companies that they trust and will be able to integrate with," said Dr. Clark.

Another Agfa enhancement that has proved particularly useful during the COVID-19 pandemic is the remote collaboration screen sharing capability that allows faculty radiologists to teach residents and collaborate on studies without having to huddle over the same screen.

"You just click on a button, select the resident and up pops the study. You can interact with it, chat with the resident in a chat box, and move your cursor around to point something out. You can also switch presenters. It allows me to be anywhere and collaborate with any other faculty member or resident."

Dr. Clark was especially pleased with Agfa's approach to training, which relied on the designation of a physician champion, who is more familiar with the day-to-day requirements of the radiologists than an outside trainer.

The 50 faculty and 50 to 60 trainees are not equally proficient with technology, but after a year and a half, said Dr. Clark, everyone is comfortable with the Agfa EI system and taking advantage of its productivity enhancements.

Outpatient radiology services, which are outside the University Hospital System, are still managed by a conventional, third-party PACS, and there are no plans to replace it at this time.

"With Agfa, we can integrate a lot of hospital-based imaging into the enterprise imaging solution. Hospitals can really take advantage of the power of the platform," noted Dr. Clark.

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VIEWPOINT

Canadian app developer targets brain health with new, multi-dimensional solution

The system works by using AI, pharmaceuticals, and alternative therapies to provide personalized solutions.

BY DR. SUNNY MALHOTRA

Nurosene is a company dedicated to providing fundamental tools and strategies to improve neurocognition and mental wellness. Created in 2020 and launched publicly in May 2021, Toronto-based Nurosene is headed by CEO Ranjit Bath, an influential and driven leader with more than 20 years under his belt in various health, wellness, and technology companies.

Nurosene is a solution to the mental health deterioration brought on by the COVID-19 pandemic. The company aims to offer new solutions to the way diseases are treated and to enhance mental wellness.

Its solution works by utilizing artificial intelligence (AI) technology, pharmaceuticals, and alternative therapies to provide personalized, actionable, and adaptable functional strategies to improve brain performance and overall health. Through research and development, they have employed an evidence-based and data-driven 4x4 model of human behavior: four therapeutic fundamentals to target the four different human structures that unify the body, brain, and mind.

The spinal cord, peripheral nerves, cerebral cortex, and brain stem all function harmoniously to create a complex yet dynamic functioning system that allows the integration of physical and neurocognitive abilities to be processed as one unique being through the activation of multiple neural networks.

These abilities are nurtured by four therapeutic fundamentals: movement, nutrition, cognitive training, and recovery. Movement is critical for both physical and mental wellbeing as it affects multiple aspects of the body.

From the simplicity of blood flow to the complexity of immunity, it holds importance for every functioning unit within the human body.

Nutrition fuels the various processes in our bodies to work more efficiently and effectively and can positively impact these mental and physical states.

No doubt, the brain is the most complex human organ – it is fundamental to creating movement, having feelings, and cultivating thoughts. Recovery is the time needed to rest that allows these processes and structures to strengthen, fine-tune, and improve mental and physical health.

These fundamentals work to provide support for and nurture the human brain, body, and mind so that mental well-being is improved, and in turn, so is overall physical health.

> **The Nuro app is designed to target the neurobiology of the brain to activate specific neurological networks that promote and maintain brain health.**

Nurosene has applied this 4x4 model to the creation of a technological app called Nuro to help the community develop and practice better brain health and better behavioral habits.

The Nuro app is designed to target the neurobiology of the brain to activate specific neurological networks that are important in promoting and maintaining brain health. It focuses on three requirements of a healthy brain; blood flow/oxygen, glucose, and activation of networks.

Dr. Sunny Malhotra is a US trained sports cardiologist working in New York. He is an entrepreneur and health technology investor. He is the winner of the national Governor General's Caring Canadian Award 2015, NY Superdoctors Rising Stars 2018 and 2019.
Twitter: @drsunnymalhotra

These requirements are separated into different activities within the app that include breathing techniques, exercise activities, activating neuronal networks through focus-based activities, space to journal, relaxation activities, and advice in articles about glucose control, general nutrition, stress reduction, etc.

Each therapeutic element is its' own category, with a multitude of activities or articles given underneath that support that particular fundamental element.

The app allows one to set reminders to complete activities or read pieces of their choosing and can track when an activity or article is complete for the week, allowing adaptability into a daily routine. It also allows one to choose from "stacks" that combine activities from each of the elements tailored to individual needs to promote better brain and physical health on a personal and individual basis.

In addition, Nurosene has procured supplements to provide nutrients and combat stressors that can be used in conjunction with the app. By targeting brain health through these basic fundamentals, the app aids in developing better human behavior over time as these activities also support healthy habits.

The Nuro app is only one of many solutions to come that Nurosene has developed to improve mental health. Nurosene strives to produce new and advanced solutions to diminish mental illnesses and promote better mental wellbeing in widespread communities.

Although Nurosene is still in its early stages of growth, it offers promising solutions backed by evidence-based science to providing personalized and adaptable strategies to improve brain performance and overall health.

Effective form of community telehealth awaiting provincial funding

BY DR. KEITH THOMPSON

This pandemic has accelerated the use of virtual care to maintain continuity of patient care, all while reducing face-to-face encounters within our healthcare systems.

Primary Care has proven to be an integral part of caring for patients in the community, in particular care at home. Yet until now, we have not seen robust integrations of primary care physician workflows in the home care sector.

Certainly, there have been numerous programs for early hospital discharge appearing, such as Remote patient monitoring (RPM) and Telehomecare programs launched as pilots. Still, many of these programs have been coordinated and supervised by hospitals as post-discharge platforms.

Programs leveraging access to ER physicians to attend patients in long-term care settings as virtual visits, or the use of community paramedics to attend medically fragile patients living at home, are both examples of using virtual care.

In these scenarios, allied health professionals can act as an extension of the primary care teams within the circles of care in the community. Equipped with the right tools and training, allied health professionals – such as nurses and PSWs – can be effective partners of primary care doctors in the home care setting.

As an example of this in the London, Ontario area, we can look at PSS Medical and Complex Care in Community. This non-profit organization, established in 1988, cares for people with complex needs, including significant physical, medical and/or developmental disabilities. In small group homes, it helps these people reach their full potential in the community. Aspects of this care include:

> **Physicians using remote instruments can bring exams right into the home, aided by nurses and PSWs.**

- 24/7 Supportive Housing;
- Specialized care for people considered medically fragile, and/or technologically dependent, including those living with chronic mechanical ventilation (CMV);
- Day and overnight respite;
- Family resource/passport funding; and
- Recreational programs PHSS operates over 60 accessible locations in neighborhoods across the province.

The medical challenges include compromised immune systems, time consuming appointments, and transportation challenges. Anxiety and fear are all components of the challenges facing this population. Moreover, accessing medical services in a time of COVID restrictions have made that access even more complicated.

The costs of staff attendance and transportation for these individuals within London, Ontario could be up to $315. By contrast, physicians coming to the home to encounter their patients at PHSS will bill OHIP the house call assessment fee ($45.15)

CONTINUED ON PAGE 22

SigMail offers secure messaging for healthcare providers and patients

BY DR. DUNCAN ROZARIO

Over the past 25 years in surgical practice, I have had numerous patients who preferred to send an email over any other form of communication, and through all these years, my standard answer has been that email is not secure.

A lesser-known fact is that the College of Physicians and Surgeons of Ontario, the Canadian Medical Protective Association, and the Information and Privacy Commissioner of Ontario require personal health information (PHI) to be sent via secure or encrypted methods. While email is the lifeline of most businesses, we do not have modern secure virtual ways to share PHI in the healthcare industry.

In the modern era when artificial intelligence and machine learning are shaping the contours of our society, Canada's healthcare industry has been heavily reliant on older technologies. Currently, family physicians, specialists, and hospital communication teams across the Canadian healthcare sector depend largely on faxes.

Dr. Duncan Rozario

In an attempt to drive change in the industry, I collaborated with Arjun Jasuja, CEO of the Sigma Group to form a core team with technology and healthcare visionaries, to ultimately create Sigma HealthTech (www.sigmahealthtech.com).

Our first product, SigMail, is an end-to-end secure encrypted and integrated messaging, video, and scheduling platform that allows healthcare providers and medical offices to communicate with each other, and their patients, putting patients in the centre of their healthcare.

As digital transformation shapes the healthcare sector, it is imperative that healthcare visits are securely translated into virtual visits where appropriate, a change that is spearheaded by platforms like SigMail. We need to use multiple channels of interaction in an integrated fashion to ensure we use the right method for the right patient at the right time.

SigMail provides medical offices with a virtual front desk to provide secure messaging and video communication with their patients and allows them to send and receive referrals and consultations securely.

Asynchronous communication with secure messaging is up to five times more efficient than synchronous methods such as telephone or in-person visits, and provides a clear return on investment in time and resources for patient and provider. Additionally, SigMail's shared inbox model optimizes workflows and allows patient communication to be managed by the entire care team, not just physicians.

This platform enhances patient and caregiver experience, optimizes workflow and increases the efficiency of communication.

With an intuitive email-like front-end and a secure back-end, SigMail easily integrates secure messages into office Electronic Medical Records (EMR) to track patient symptoms, treatment outcomes, side effects and case histories and creates a central database by eliminating data silos.

As we start the next chapter of our growth strategy, we are also expanding to enterprise-level health information systems such as Meditech and EPIC. SigMail has been selected as a Vendor of Record for Virtual Visits Solutions by Canada Health Infoway and has met the mandatory requirements to be listed on the Virtual Visits Verification solutions website of Ontario Health.

Dr. Duncan Rozario is a general surgeon and the Chief of Surgery at Oakville Trafalgar Memorial Hospital. He is the Chief Medical Officer of Sigma Healthtech, which has been created to improve communication among patients and care teams. He can be reached at: drozario@sigmahealthtech.com

Innovation in the home sector provides new solutions for patients and caregivers

Bayshore has launched a digital platform, and AlayaCare is improving caregiver retention rates using analytics.

BY DIANNE DANIEL

With the vast majority now choosing to age in place, there's no place like home for Canadian seniors. And as home care providers and family caregivers work to keep them healthy, safe, and comfortable, digital health technologies are paving the way forward, transforming the home-care delivery model to create a better experience for both those receiving care and those providing it.

"About two-and-a-half to three years ago we saw an opportunity as an organization to invest heavily in the future to build out a platform and suite of digital products," said Kevin Webster, COO at Bayshore Healthcare, a provider of home and community health care services with more than 14,500 staff members delivering home care to roughly 350,000 Canadians annually.

The goal, said Webster, is to create "a connection to people receiving home care that's broader than just the phone; that their caregivers and other members of the family and potentially other members of the circle of care can tap into … that ultimately creates a care opportunity that's less fragmented and more convenient."

The company's three-year strategic investment in a digital platform was led by a team of innovative digital architects under the direction of Bayshore director of Business Transformation Dheeraj Paul. The result is the launch of Bayshore Digital Experience Platform (Bayshore DXP), a scalable, web-based platform built on Amazon Web Services that is designed to drive patient experiences for multiple home care scenarios, starting with senior care but eventually broadening to include palliative care and other chronic care pathways.

As it evolves, the platform will offer plug and play capability, enabling data to be collected from sensors, Fitbits, Apple watches and other wellness devices. For example, and it will also connect to remote monitoring and other digital services.

The first experience to launch on the platform is MyBayshoreCare, a secure digital patient hub initially rolled out to 2,200 pilot users in B.C., Alberta and Ontario that enables family members to access their loved one's senior care schedule, communicate with their care team, book virtual visits, and receive updates or reminders.

It also provides information about the care team, including photos of staff so elderly clients can see who will be visiting, as well as billing information and the ability to pay online.

"Now that we have over 2,000 people using this – especially in the frail and elderly space – we have this enormous incubator to start to look at, understand and test what are the features and functionality these individuals find most important," said Webster, adding that the goal is to get more than 50 percent of all Bayshore patients connected digitally over the next three years. "We've come out of the gate," he said.

Hamilton, Ontario, resident Bettie Vangils Kloet is among the early MyBayshoreCare users. As decision maker and power of attorney for both of her elderly parents, Vangils Kloet was finding the phone calls to coordinate and manage care "exhausting." Her father resides in a long-term care facility and her mother, whose diagnosis of dementia is worsening, lives alone in a condo in Owen Sound, Ontario.

"It's been a challenge to manage everything at a distance, but applications like this have made it easier," she said, noting that access to the digital hub has lightened her load.

Vangils Kloet's mother currently receives three visits from a Bayshore caregiver each week and she expects more to be added in the future. When she needs to change the schedule or send a message to the caregiver, she logs into MyBayshoreCare. If she needs more direct contact or an immediate response from the caregiver, she uses a cellphone.

One feature she'd like to see added to the app is the ability to confirm that any messages she leaves for the caregiver have been seen and read. She appreciates the visit reminders that automatically populate her calendar and the most valuable feature, she said, is the wellness update.

"I know when my mom's caregiver is scheduled and within five minutes of the end of her shift, I know reliably that I can go onto my phone and read the report," said Vangils Kloet, adding that the note might include a medication update or a mention that her mom's hair was washed and styled, for example. "That is immensely comforting. I know what happened. I know that mom is well and that she's safe," she said.

Overall, adding a digital element to her mom's home care experience is providing "peace of mind" and she already has several thoughts on what features could be added, such as a connection to a medical alert bracelet or the ability to communicate with the local county paramedic program.

Bayshore's vision is based on building a future-facing platform that will evolve as home care needs grow and evolve, and as technology shifts. Though the digital strategy was launched long before COVID-19 became a household term, the pandemic is helping to speed adoption of the technology, said Webster.

"There's definitely an openness to engage with technology for care. It's become much more acceptable, and people are looking for ways to make it easier," he said. "COVID aside, expectations are shifting and changing."

Another area where digital innovation is transforming the home care space is on the provider side, as more agencies turn to technology to solve operational challenges. One company working to bring leading-edge tools to the back office is AlayaCare, which offers a cloud-based software-as-a-service home care platform that supports clinical documentation, integrated scheduling, billing and payroll, and virtual care. It also provides a caregiver app and a family portal.

AlayaLabs, a research-funded arm of the company, is where a dedicated data science team is currently focused on using data insights to help clients solve three of the biggest problems facing the industry: employee churn and retention; scheduling optimization; and reducing adverse events and hospital readmissions. Working with validation partners, the team listens to their challenges and then comes up with a hypothesis that is tested, validated, and eventually rolled out as a product feature.

"A lot of our clients are very forward thinking," said Head of AlayaLabs Naomi Goldapple. "They really want to go out on the bleeding edge with us."

Recently, the team worked closely with Integracare Inc., a senior home care services provider based in Mississauga and Toronto, Ontario, to tackle the problem of employee churn and retention. According to Goldapple, the U.S. employee churn rate in home care was as high as 82 percent in 2018 and in Canada, it typically hovers around 40 percent, but is currently a bit higher due to the pandemic.

When the AlayaLabs team researched why turnover is so high, they found the number one reason is that caregivers don't get enough hours. Additional contributing factors include the amount of travel between visits, the quality of the visit, and the lag time between hiring and first visit in the field. The hypothesis was that workers who are satisfied will stick around longer.

Integracare president and CEO Lee Grunberg had already developed an employee satisfaction algorithm and was manually pulling data from AlayaCare into a spreadsheet to develop caregiver satisfaction scores specific to his company. What he needed was an automated approach.

Using the factors considered to drive employee satisfaction as metrics, AlayaLabs built a model to pull data from Integracare every day to assign a satisfaction score for each employee. The information is

ILLUSTRATION: LINDA WEISS

displayed on the company's AlayaCare home page as in interactive dashboard.

"Every day you can look at your bottom 10 percent of scores and see what you can do to improve their satisfaction," explained Goldapple. "Maybe that's calling them up and saying, 'How's your schedule? Do you like it?' or maybe it's trying to find them more hours or finding out if they're not getting the shifts they want and trying to fix that."

After implementing the dashboard, Integracare improved overall employee satisfaction by 30 percent, moving 22 percent of high-risk employees to 'green' or engaged status within in a month. Though he acknowledges his company isn't immune to the challenge of recruiting and retaining caregivers, Grunberg does believe in the power of analytics to help solve it.

"I think we're doing significantly better than most home care companies and a large part of that is the fact that we have the tools that AlayaCare has automated for us," he said, noting that the dashboard projects employee satisfaction four weeks out. If it appears an employee may be unsatisfied with their schedule in a month's time, for example, care managers and schedulers intervene to prevent caregiver dissatisfaction and as result, reduce turnover.

Grunberg decided to partner with AlayaCare shortly after purchasing the business in 2016. He says operating on a digital platform gives him the ability to use data to run reliability and punctuality reports, and to evaluate caregiver performance feedback to ensure he retains the highest quality caregivers in the industry.

"We were on a Microsoft Access database and a paper system, and I knew it was nowhere near robust enough to allow us to grow, nor did it have the reporting capabilities I was going to need to be able to improve the quality of care we provide to clients," he said. "Having a software platform that allows our clients, caregivers and care managers/schedulers to all be able to communicate and evaluate care plans, risks, medical history and schedules allows for much improved communication and communication yields better care."

Meanwhile, what started out as an experiment on behalf of Integracare is now an employee retention dashboard that all AlayaCare customers can use, each one adapting it to reflect slight differences in what they believe drives churn within their organization. In addition to measuring employee satisfaction, the dashboard also provides the capability to monitor monthly, yearly, and year-to-date turnover.

Applying data science, the AlayaLabs team found higher turnover rates in employees under 30, whereas employees 45 and older are likely to be more committed. They also discovered that if an employee is routinely clocking in late, it usually indicates they are getting disenchanted.

Another hypothesis was that sloppy or cryptic notes might be an early indicator for a disgruntled employee. Though they didn't find the correlation they were looking for, they did discover that important information is often missed in caregiver notes.

"We realized that sometimes the clinical supervisors are too busy to read all of the notes in a timely fashion, and that some very important information there should be a red flag," said Goldapple. "… We said let's train our system to go in and see if it can accurately tag these as red or yellow flags and we will bubble up those notifications to clinical supervisors so they can act on them."

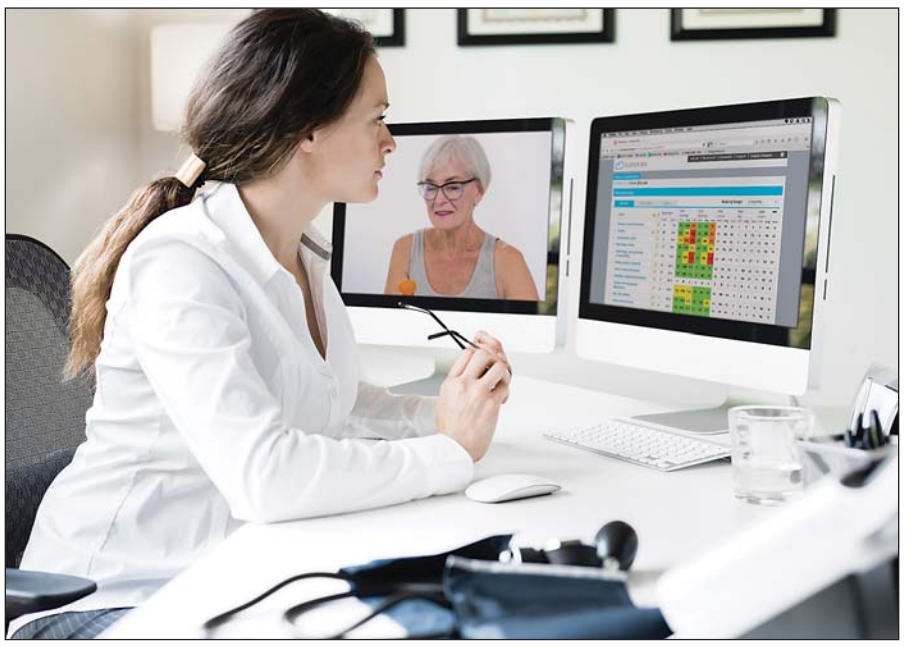
The capability is currently being piloted to help reduce adverse events and hospital readmission rates among patients receiving home care. Red flags might be anything to do with a fall, cardiac issues, or an oozing wound, for example, and yellow flags could be behavioural or dietary changes.

"People who would normally go into a care centre for rehabilitation are preferring to go home, but they are going home ill or with a chronic condition, so the level of 'hospital at home' is becoming more of a thing," said Goldapple, adding that digital solutions will be important as home care continues to expand.

Bayshore's Webster agrees: "As more acutely ill individuals end up staying at home, some of this technology is going to be critically important to ensure they get the right care, and cost-effective care as well."

Remote patient monitoring helps hospitals alleviate surgical backlog

BY ELLYN WINTERS-ROBINSON



Diana Brozovic's surgery at Hamilton Health Sciences' (HHS) Juravinski Hospital and Cancer Centre (JHCC) to remove a cancerous tumour from the outer wall of her stomach had gone well, and she had been discharged to recover at home.

However, about a week after returning home, Diana began to feel unwell. It turns out she had a postoperative complication – a small gastrointestinal bleed that needed to be repaired.

Every year, more than 200 million adults like Diana across the globe undergo major non-cardiac surgery. Of these, between 15-20 percent of individuals undergoing surgery end up returning for emergency treatment or hospitalization within the first 30 days.

Fortunately for Diana, her post-surgical complication was caught quickly by HHS' Surgical Transitions program, a virtual care initiative launched in partnership with St. Joseph's Healthcare Hamilton (SJHH) during the pandemic to connect patients from the comfort of their homes with their healthcare team by just the touch of a screen.

When she was discharged after her surgery, Diana was sent home with the Cloud DX Connected Health kit, a remote automated monitoring (RAM) solution that includes a tablet computer paired with equipment to capture critical vital signs and weight.

Patient data captured by Cloud DX flows back to the hospital's virtual care team of nurses and doctors who remotely monitor the patient from the joint hospital command centre.

The virtual care regimen includes a daily patient vital signs review, nurse video visits and assessments, surgical wound photography and review, medication error detection and correction, and pain assessment.

Together, the nurses and physicians review the patients' recovery daily, and nurses escalate care when the attention of a physician is needed. Upon discharge from the program, the patient returns the device to the command centre.

The surgical transitions program operates seven days a week, 14 hours a day, so patients recovering from home receive near round-the-clock care.

The Surgical Transitions program is anchored by the HHS and SJHH Divisions of Perioperative Care. It's based on the latest Canadian research, led by a team of surgical care researchers at the Population Health Research Institute (PHRI), a joint institute of HHS and McMaster University.

The research trial, called "Post-discharge after surgery using virtual care with remote automated monitoring (PVC-RAM)", ran over the course of 2020 to evaluate the effect of virtual care and RAM technology on unplanned hospitalizations and emergency department and acute care visits.

There were 900 patient participants in the trial, across eight hospital locations in Ontario and Alberta, including HHS, SJHH, London Health Sciences Centre, The Ottawa Hospital, Kingston Health Sciences Centre and University of Alberta Hospital.

"We can cut post-operative deaths and complications in half with continuous monitoring in patients' homes and surgical wards," said Dr. P.J. Devereaux, cardiologist and perioperative care physician at HHS, and co-principal investigator of the trial.

In Diana's case, the HHS virtual care team noted a drop in her blood pressure and called to check in. They recommended she go for tests in her home community, about an hour away from Hamilton.

When the results were in, they then instructed her to go to the emergency department at the JHCC where she underwent a procedure to swiftly and efficiently resolve her gastrointestinal bleeding.

"Since our program has everything documented on the patients, we were able to connect with the team at the JHCC to ensure they were prepared for Diana when she arrived," said Mikeera Dobson, a registered nurse with the virtual command centre and Brozovic's lead nurse.

Like many hospitals across Canada, the pandemic has resulted in significant surgical backlogs. The Financial Accountability Office of Ontario estimates that Ontario hospitals expect to face a backlog of 419,000 elective surgeries and 2.5 million diagnostic tests by September 2021.

The report predicts it will take more than three years to eliminate the backlogs at a cost of $1.3 billion. HHS alone postponed more than 5,600 non-urgent/non-emergent procedures since April 12 and SJHH has postponed more than 5,700 non-urgent/non-emergent surgical procedures during this same time at the height of the third wave.

Patient data captured by Cloud DX flows back to a hospital command centre, where it is monitored by clinicians.

"It is our goal that the innovative Surgical Transition program will provide support to post-operative patients as they transition home, simultaneously decreasing the need for returns to the Emergency Department and readmission," said Dr. Rahima Nenshi, the clinical lead for Perioperative Care and the director of Acute Care Surgery at SJHH. "This will support the ramp up of surgeries that have been delayed and are so desperately needed."

To date, the Surgical Transition program has served surgical patients from various care pathways at both SJHH and HHS. This program improves the patient experience, increases accessibility to care, gives peace of mind and helps support patients and their families in the comfort of their home environment.

"It's been amazing to see the difference this program has made in our patients' lives," says Dobson. "Not only can we catch complications early, like with Diana, but in many cases, we can prevent patients from even having to go to the emergency department altogether."

Diana Brozovic couldn't agree more.

"Being part of this program was a huge security blanket for me," she said. "Having the resources available as well as the support of the medical team was terrific. I could ask questions when I needed to, and I even got familiar with vitals. I felt very well cared for and can't thank the team enough."

Ellyn Winters-Robinson is CMO at Ignition Communications Inc.

BC and Canada fund resource centre for indigenous health

VICTORIA, BC – Ongoing efforts to make healthcare systems culturally safe and accessible for all First Nations Peoples, Inuit and Métis peoples in B.C. and across Canada are being strengthened with the creation of a ground-breaking repository of resources at the National Collaborating Centre for Indigenous Health (NCCIH).

"This project will go a long way toward addressing the issue of Indigenous-specific racism in our health system, but also can serve as an important model and training opportunity for the rest of Canada," said Adrian Dix, BC's minister of health. "We are proud to collaborate on something so integral that will deepen our understanding of cultural safety and awareness, and ensure our systems are safe for everyone."

The NCCIH is based at the University of Northern British Columbia in Prince George.

New public funding will support the NCCIH to grow the first-ever collection of cultural safety and Indigenous-specific anti-racism tools and resources.

Indigenous Services Canada is providing $520,000 over five years to support this initiative nationally and the Government of British Columbia is contributing $550,000 to enable B.C. health system partners to create tools, strategies and resources to enhance culturally safe service delivery and practices across the health system.

The public online library includes videos, communication resources, research papers, training materials and educational platforms that will enhance this work. Resources already available include:

- the recently produced video, Healing in Pandemic Times;
- the booklet, Creating a climate for change: Cultural safety and humility for First Nations and Aboriginal Peoples in British Columbia; and
- Land for healing: Developing a First Nations land-based delivery model – First Nations Mental Wellness Framework.

Adrian Dix, Minister of Health for British Columbia.

"This collection of critical information will help to guide and inform the best efforts of all healthcare workers to address and stop stigma and discrimination against Indigenous peoples in health systems," said Margo Greenwood, academic leader, National Collaborating Centre for Indigenous Health.

Ensuring cultural safety, recognizing Indigenous knowl-

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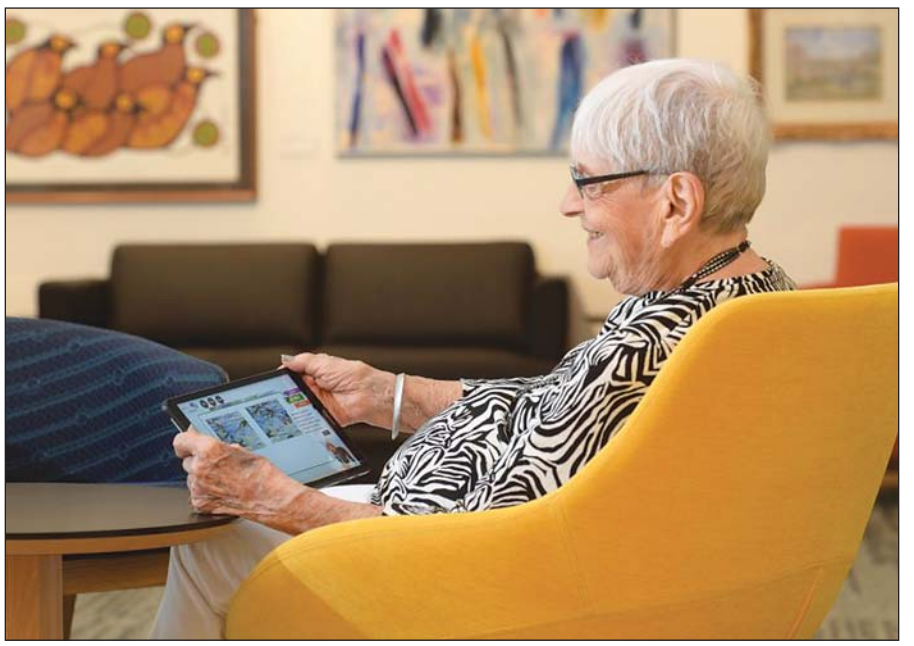
Apps and digital platforms helping seniors stay engaged in long-term care

BY ARIELLE RICKETTS



Innovators around the world are addressing the challenges of long-term care facilities – including the mental health of residents and their overall quality of care – by leveraging health-tech solutions.

For example, to help residents living with dementia better communicate with caregivers and loved ones, Dr. Ana-Inés Ansaldo, a professor at the School of Speech Pathology and Audiology at the University of Montreal, created the COMPAs app. COMPAs, which stands for COMmunication Proche Aidant, works like an online treasure chest to store images, music, and videos from significant moments in a person's life.

Family members and caregivers can use these special items in the app to spark genuine, person-centred moments of engagement with their loved ones who may be experiencing verbal communication challenges because of advanced dementia.

After receiving support through the Centre for Aging + Brain Health Innovation (CABHI)'s Spark Program for early-stage aging and brain health solutions, Dr. Ansaldo and her team quickly expanded the app to introduce it to 11 long-term care homes in Montreal.

As some safety restrictions begin to lift in long-term care homes across the country, the COMPAs app will be especially helpful for residents and family members reconnecting after months of physical distancing.

Verbal communication is a significant challenge for more than 64 percent of residents living with dementia in long-term care today. Behavioural and psychological symptoms, such as agitation and aggression, are also common among people with dementia.

These symptoms can be caused by changes in environment, misperceived threats, or disruptions in routines. While medication is often used to curb behavioural and psychological symptoms, significant evidence suggests that non-pharmaceutical interventions, like CABHI-supported MindfulGarden, may be a gentler and more effective tool for alleviating negative mood and behaviour changes.

MindfulGarden is a unique digital platform that de-escalates agitation among people living with dementia in hospitals and long-term care settings. The device works by intuitively responding to a patient's individual distress level.

When a patient exhibits distress cues in their voice, heart rate or gestures, MindfulGarden reacts by displaying soothing images of iridescent butterflies and blooming flowers on a TV-like monitor, which helps to redirect the patient's anxiety. The higher the anxiety level, the more responsive the images on screen become.

As part of their COVID-19 response plan, co-founder Mark Ross and founder and CEO Catherine Winckler worked with healthcare providers to launch MindfulGarden on tablets and provide training to caregivers in hospitals and long-term care homes.

With support from CABHI, life enrichment platform Linked Senior is using technology and education to create meaningful moments of engagement for older adults in assisted living, memory care, and long-term care environments.

With their social engagement app Celo Basic, the company is helping healthcare providers connect residents to their unique interests and hobbies – whether that's running, reading, or listening to music. Celo Basic provides residents with personalized recreational activities, such as evidence-based brain and fitness games, life-long learning opportunities, music therapy, and spiritual programming.

ArtontheBrain, another recreational activity app designed for older adults, presents high-quality visual art from world-class museums, like the Museum of Modern Art, in an interactive online environment. ArtontheBrain offers older adults a way to stay informed and connected while maintaining their social and cognitive health. Powered by Baycrest and supported by CABHI, this scientifically validated intervention also helps to build the relationship between older adults and their circle of care through a virtual platform.

For many residents, mobility challenges can negatively impact feelings of independence and autonomy. A lack of mobility can also reduce a resident's ability to interact with others.

Canadian startup Braze Mobility has created a solution to help change this. Their

CONTINUED ON PAGE 23

Technology can match mental health clients with care providers

While anxiety, depression and other mental health challenges have troubled an increasing number of people during the pandemic, finding the right therapist to talk to has not been easy. A therapist who might help one client may not be a good fit for another. So how does one locate the right therapist or mental health group?

To help solve this problem now and in the future, Toronto-based Layla has created a service that combines online intake, an algorithm that assists with matching, and a consultation call with a care coordinator to ensure that individuals and couples are connected with the right therapist.

"At Layla, we believe human connection plays a fundamental role in helping create hope for the future and to unlock the benefits of psychotherapy," said Charan Litt, director of Layla Therapy. "We've seen this first-hand in matching clients to therapists and supporting them in their psychotherapy journey, both in-person and virtually.

According to Litt, Layla is the first tech-powered service that bridges the gap between those in need of mental healthcare and those who provide it.

As an initial step, clients go through Layla's simple digital intake form where they provide responses about their presenting concerns, how they're feeling and their preferences. An algorithm then secures a therapist match based on the information shared, taking into consideration specific needs around language, culture, life experiences and therapy style.

A call with a care coordinator ensures that the match makes sense.

Layla has supported several thousand clients since starting in 2019 and has close to 100 partner therapists. The company was launched by Samer Abughannam, who is now its CEO, after he noticed the fragmentation of mental health services in Canada, and the difficulties that people were having access to the right care – himself included.

An internal tech team built the software that's used for online intake as well as the algorithm for matching clients and therapists. Layla now employs 25 people, about half of them involved in product development.

"At least half of the team is involved in some capacity in product development. For us, the product and clinical service go hand in hand," Abughannam said.

At the moment, Layla is connecting clients to real therapists and counsellors. For the most part, they consist of video sessions that allow patients to see therapists over the Layla app, with minimal phone sessions. In some instances, texting has been used.

While person-to-person encounters are currently the basis of successful therapy, there has been much speculation in the industry about whether therapeutic sessions could be computerized in the future.

> **Layla bridges the gap between those who need mental healthcare and those who provide it.**

Can artificial intelligence, for example, be used to model a therapist or counsellor?

"When it comes to counselling and building a therapeutic relationship, it's a matter of feeling heard by your therapist," said Litt. "Each client has their own unique experiences and needs that require tailored guidance from their therapist. While machine learning and natural language processing could play a role in the delivery of homework and feedback, the real question is: can robots make you feel heard? Which raises another key question: What makes people feel heard?"

She explained that it's not a simple answer. "It requires empathy, active listening and adapting to create a safe environment for patients to feel heard and understood," said Litt. "This experience strengthens the bond between therapists and patients to ensure an effective outcome."

She observed that this emotional experience would be hard for robots to replicate, and even if they could, what happens when the robot gets it wrong? Would it complicate the trauma or make complex cases even more difficult?

Yet, it's possible that for some people, a robot or computerized therapist might actually be beneficial.

"For a specific group of people, such as patients with social anxiety, robots could be a great starting point, by giving patients the option to start with a robot and then gradually move to human therapists. This could create a new form of gradual exposure therapy."

In the meantime, Layla has been using its hybrid mix of technology and people to connect clients with mental health concerns to the professional sources of help they need. For more information, see: https://www.layla.care/

Use of healthcare apps expanded by 25 percent during the pandemic

BY ROSALIND STEFANAC

When Toronto pharmacist Michael Do saw how much his patients were struggling to remember when to take their medications and what they were used for, he decided to create an app that would do the work for them.

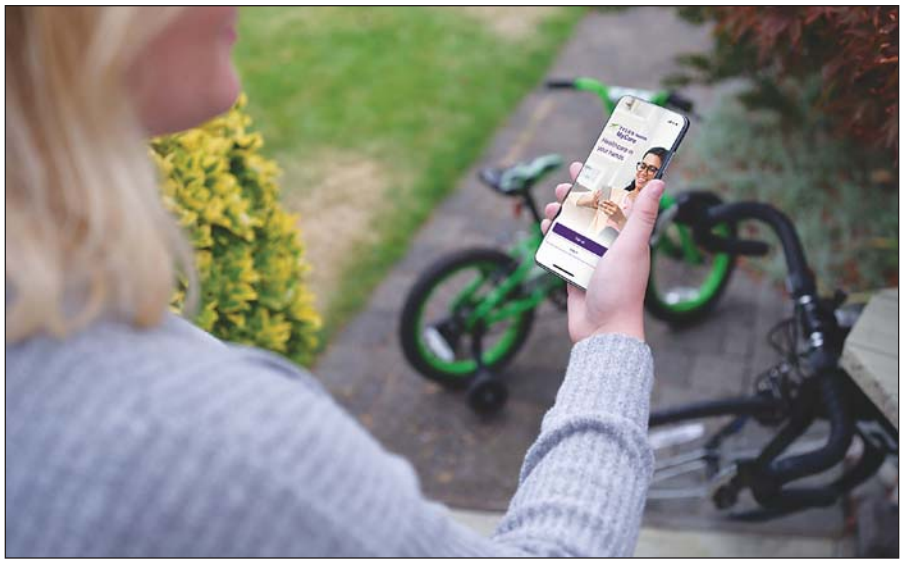
"One of our core duties [as pharmacists] is to educate patients and ensure they're using their medications appropriately… however, I realized that it didn't matter how hard we worked at the pharmacy, we still had patients that ended up at the hospital," he said. "We needed a better support system that might start at the pharmacy but would extend to and support patients at home."

He launched the MedEssist app in 2018, which allows patients to see pictures of what their medications looks like and get reminders for how and when to take them.

Do said younger patients prefer the app for refilling medications quickly and for the daily med reminders, whereas older patients like using it as an electronic medication record and as a communication tool with their pharmacist. "For older patients, MedEssist is often recommended to them by their pharmacist whereas younger patients are more proactive in downloading [the free app] after seeing one of our posters at the pharmacy," he said.

These days, as more and more Canadians aim to get better control of their health, they're turning to mobile apps as a convenient way to access credible health information. After all, they can use health apps to track their insulin levels, symptom progression and body temperature. The Apple Watch can even track atrial fibrillation based on heartbeat data.

This year, TELUS Health MyCare App has added features that sync data from other activity trackers and wearables to help gauge mood and activity levels, as well as giving users the ability to track their symptoms and determine how healthy they are by using AI technology. Users can also use the app to book a video appointment with a local physician or mental health counsellor.



But it's not just patients benefiting from mobile apps. Physicians, nurses and other healthcare providers can also access this data in real-time to quickly make a diagnosis, identify changes in vital statistics and analyze sudden symptoms. MedEssist recently launched the pharmacist dashboard app which is helping pharmacies conduct flu and COVID-19 vaccinations seamlessly by taking care of appointment bookings and organizing patient data.

According to HealthWorks Collective, there were more than 97,000 health and fitness apps available for mobile and tablet devices in October 2020, with the mobile health apps market expected to exceed US$111 billion by 2025.

It's no surprise then that mobile app and web development programs (see for example, coursecompare.ca for online courses and programs in this area) are booming as a result. In fact, research published by the Organization for the Review of Care and Health Applications (ORCHA) noted there has been a 25 percent upsurge in mobile health app downloads during the pandemic.

Chris Engst, director of TELUS Health MyCare

Chris Engst, director of TELUS Health MyCare, said accessibility has always been important to patients when it comes to health care, but COVID-19 has taken that up another notch making mobile apps all the more appealing.

"I think with COVID-19, you just saw this massive change in people's perceptions, both from the provider and patient side, to say is this just becoming a normal way to access healthcare," he said.

"We also have very stringent safeguards in place not only to protect data, but to be very clear with patients about what we use that data for – and I think that's very important."

With the rise of mental health issues, he said another key aspect of apps like TELUS' is the ability to quickly connect users with mental health resources and counsellors.

"Roughly 15 percent of our physician cohort are mental health related, and we're investing heavily in mental health services because people are really struggling now," said Engst. He also points to the fact that 60 percent of patients using the app don't have a family doctor, which means the mobile service is helping fill a real healthcare gap across the country.

"During the pandemic, apps and technology are becoming more and more important within healthcare because they are solving important problems that can't be solved otherwise," said Do.

With so many patients needing to access healthcare virtually and even to book their COVID-19 vaccine online, he believes the healthcare app trend will only continue to expand globally.

"The need to have a verified vaccination record on hand is going to expose everyone to having healthcare records on their phones," he said.

Community telehealth

CONTINUED FROM PAGE 16

plus a travel premium of $36.40 and attendance premiums during the day of $27.50 and up to $66 if after 5pm.

This means the minimum cost of the physician to attend is $109, a visit that could be done virtually using peripheral examination tools and if allowed under the OHIP – resulting in a charge of only $45.15 to the provincial health system.

The ROI for visiting complex needs patients at home is clear, but the challenges are both funding, workflow adoptions and training of staff that supports the virtual care assessments on the patient side.

The medical assessments required for PHSS often go beyond video only, and as such iTelemed has been working with these patient partners to demonstrate the "test of change" in workflows associated with the medical visits traditionally performed as face-to-face in office or by physician house calls.

Incorporating stethoscope, otoscope and oximeter equipment into a telemedicine tablet able to operate on cell phone or WiFi connections within PHSS residential homes, this equipment allows the patients to be assessed with near bedside quality fidelity, but without the risk of transportation or time needed for physicians to travel to the residence.

The virtual house calls may be cost effective and convenient, tick all the boxes of the quintuple aim for healthcare, but the cost of equipment, cost of WiFi or cell phone connections and added training of staff, are additional cost layers for serving individuals at home.

These are costs that may be covered easily if this model of care produces outcomes such as saved visits to the ER or admissions to hospital for complex needs patients as the costs of transportation alone are a heavy financial burden to PHSS. The partnerships that have formed around this project are far reaching. iTelemed, based in London, supplies our telehealth technology. In turn, it has formed alliances with Fanshawe College Corporate Training Solutions, also in London, Ont., to train caregivers on the equipment.

The physicians involved in the program have created the preliminary medical directives and have met with PHSS staff to review the training required to make for ease of workflows when encountering patients at home.

Together, PHSS, iTelemed and Fanshawe College CTS are mapping the workflows, technical supports, and patient workflows using the mobile kits.

> **Securing sustainable funding for the technology and for physician services has been challenging.**

They're developing an accredited training program that will be controlled by PHSS as a "train the trainer" model.

A significant advantage of this approach is that the support staff work with the PHSS individuals, know them intimately, and there is a pre-existing relationship of trust between all the members of the circle of care team.

The technology provided by iTelemed can now be the supplement and a means of improving the integration of community-based care with primary care providers.

This program is currently on hold until funding can be secured to fully evolve the training.

The other challenge is how to secure sustainable funding for both the technology and physician services required. Currently, the MOH does not allow house calls to be billed as an insured service if performed virtually using peripheral technologies.

The challenge is for policy planners and provincial healthcare funders to transition from hospital-based services to community-based services that are integrated with primary care.

This would be a cost-effective and medically effective way of delivering care to our most vulnerable and marginalized populations. The digital divide can be solved by partnering with programs such as PHSS and Fanshawe College CTS, leveraging not only technical and allied health training, but creating sustainable digital health ecosystems that will be long lasting.

Panelists say EHR, and healthcare in general, are facing drastic changes

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I've taken in the last five years have been tracked," he said.

"And there are now systems that can analyze your smartphone interactions to tell if you're having a mental health breakdown, with 87 percent accuracy."

Health data and the systems that can analyze it are valuable, our panelists agreed. But organizations must invest in the technology, if they wish to benefit their patients.

On this score, Khayat said organizations should take the initiative and not wait for governments to lead the way. "If you do that, your grandchildren's grandchildren will still be waiting."

Indeed, she observed that digital innovation is becoming crucial to supporting improved healthcare delivery. "If you don't have an IT IQ [intelligence quotient] in your organization, you're not going to survive."

To continually improve, Khayat said that organizations should focus on using technology for "evolving their core processes". But they should also try to make bigger leaps with "completely new stuff".

These highly innovative projects, however, should probably be done as separate "skunk works" that can operate independently. In this way, they are protected from more conservative forces in organizations that seek to preserve old ways of doing things.

She noted that countries and organizations that tend to be most successful in healthcare technology are not afraid of launching ambitious projects. "The secret sauce is in BHAG, or Big Hairy Audacious Goals," she quipped. In the Netherlands, she said, the government set out to enable people with chronic diseases to contact their doctors in any way they choose – email, text or video – within four years.

They also set a target of having these patients monitored at home, eliminating the need for in-patient visits for 80% of chronic care patients.

Finally, they set a four-year goal of enabling the population to access their health records, as well.

While these were government-led projects in Europe, she is skeptical that Canadian governments could drive such innovation. Instead, she said that healthcare organizations themselves would be better off leading such projects.

> **The secret sauce can be found in BHAG, or Big Hairy Audacious Goals. They are projects that achieve a lot, quickly.**

Dr. Nowak noted that innovation is on the march in Canada, especially when it comes to using networks in new ways. He has been delighted to see for example, how the UHN is including referring physicians in medical rounds of in-patients, so that someone very familiar with the medical history of the patient is available to interact with the medical team on the premises.

What he'd like to see happen in future, moreover, is for electronic networks be created for people before they are sick, so they are already tied to organizations that can support them when illness strikes.

This will also keep people out of hospitals, by giving them more support in their own homes and communities. "Hospitals and doctors offices are not places that anyone wants to be," he said.

BC and Canada fund resource centre for indigenous health

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edge and supporting Indigenous-led health services are central to achieving the goal of eliminating anti-Indigenous racism in healthcare systems.

The governments of British Columbia and Canada say they remain committed to working with provincial and territorial governments, Indigenous partners and all those who work in healthcare to increase safety and respect for Indigenous peoples in Canada's healthcare systems.

"Congratulations to the NCCIH for the work it is leading to create this much-needed repository of tools and resources to address anti-Indigenous racism and promote cultural safety," said Marc Miller, federal Minister of Indigenous Services. "I am proud to support this work as we continue to take steps to address anti-Indigenous racism in Canada's healthcare systems. First Nations, Inuit and Métis have the right to be served by a first-class healthcare system without fear of discrimination or racism, no matter where they live."

Added Patrick Weiler, MP for West Vancouver – Sunshine Coast – Sea to Sky Country: "For decades, anti-Indigenous racism in healthcare has had a detrimental impact on the health and well-being of Indigenous communities. The NCCIH repository project is an important step forward in ensuring more inclusive delivery of healthcare. Through understanding and collaboration across all orders of government, projects like this will continue the vital work of ensuring cultural awareness, safety, and respect in Canada's health systems, and all institutions."

For its part, the Government of British Columbia's Budget 2021 allocated $45 million over three years to support Indigenous-specific anti-racism initiatives.

> **The NCCIH is working to attain greater respect for Indigenous peoples when they seek help in the healthcare system.**

In Budget 2021, the Government of Canada committed to provide $126.7 million over three years to take action to foster health systems free from racism and discrimination where Indigenous peoples are respected and safe.

Digital platforms help seniors stay engaged

CONTINUED FROM PAGE 21

novel wheelchair sensor system helps users navigate their world by providing audio, visual, and vibration feedback when obstacles are nearby. Since launching in 2016, the CABHI-supported company has made waves in the aging and brain health world as an evidenced-based solution providing individuals with mobility impairment a chance to regain mobile independence.

While the pandemic has accelerated the development of healthcare technologies created for long-term care settings, it's clear that this trend will last for years to come. As long-term care policies change and adapt to the times, we can expect to see even more healthcare technology radically improve the way we care and support older adults in Canada.

Visit www.cabhi.com to learn more about these and other CABHI-supported innovations supporting older adults in long-term care.

Arielle Ricketts is a Marketing & Communications Content Specialist at the Centre for Aging + Brain Health Innovation (CABHI).

Female engineer's mechanical assistive device wins Dyson Award

TORONTO, August 25, 2021 – In North America, there are over 58 million people of all ages experiencing limited hand mobility, hand and arm weakness and difficulty grasping and controlling objects, because of a medical condition or injury. This includes people living with Cerebral Palsy, Multiple Sclerosis, Muscular Dystrophy, and even those recovering from spinal cord injuries and strokes.

Performing daily activities like writing, drawing, painting, and accessing technology become very difficult or even impossible. As a result of the physical limitation these individuals experience a loss of independence, self-expression, social exclusion, and frustration.

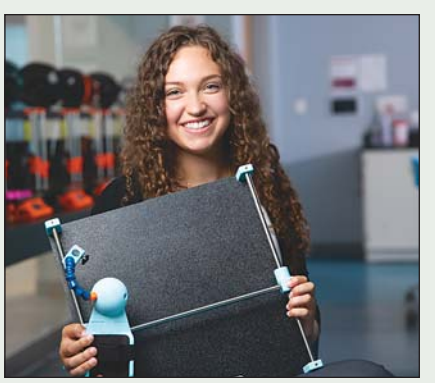
McMaster University biomedical and mechanical engineering student Lianna Genovese was inspired to innovate towards solving a real human problem and directed her energy into creating solutions that supported people with limited hand mobility in their hobbies and passions.

At 18 years old, Lianna channelled her natural entrepreneurial spirit and engineering knowledge to develop Guided Hands™: a mechanical assistive device that enables anyone living with limited hand mobility to write, paint, draw and use a touch-screen device. This innovation has been awarded the national James Dyson Award, a design award that seeks to celebrate and inspire the next generation of engineers.

Lianna says, "I met a woman named Elissa who lives with Cerebral Palsy, and after hearing her story about losing her ability to paint – a talent and passion she had lost due to the progression of her condition, I knew I had to find a solution. I wanted to help give her back her passion and contribute to a better quality of life."

Inspired by the mechanics of a 3D printer, Guided Hands uses a simple sliding system composed of linear shafts and ball bearings. The unique system promotes controlled and guided hand movements in all directions (horizontal, vertical and swivel hand motions), as the user holds a handpiece custom to the size of their hand and level of hand impairment.

The handpiece is connected to an arm attachment that holds various writing utensils (paintbrush, pen, marker, stylus, etc.) and is designed to use the patient's gross motor skills in their shoulder to perform activities rather than relying on fine motor skills in the hand which are often compromised.



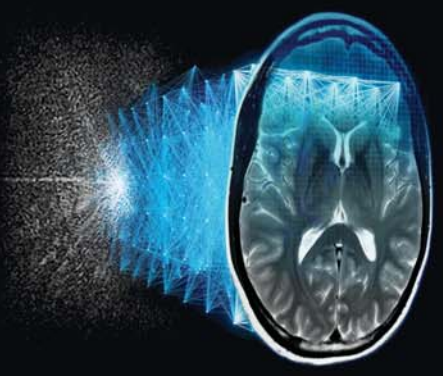
Lianna Genovese

The first prototypes of Guided Hands consisted of pipe cleaners, straws and a sponge. Lianna immediately had Elissa test the prototype and provide feedback to inspire many iterations.

Over the past two years, Lianna has connected with over 150 patients of varying medical conditions, neurologists, and occupational therapists across Canada to help inform her design and perfect the device.

Lianna says, "It was important to me to test Guided Hands in real world scenarios and get in-person feedback. After meeting with a little girl named Bella, a child with Cerebral Palsy, and witnessing the smile on her face as she wrote, coloured, drew and played games on an iPad, I knew I had found my passion.

"I realized that what started off as a school project could become a real-world solution that could help change the lives of many people."



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AIR™ Recon DL is a Canadian innovation! Dr. Marc Lebel, Lead Scientist for Neuro MR, came up with a new way of leveraging deep learning to reconstruct MR data without any noise or ringing present in the resulting images with no loss of details or introduction of artifacts. This allows our customers to reduce their scan acquisition times by 30–50% relative to the original scan times.

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- Can enable prescription changes to shorten scan time
- Images display less noise

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- Improves lesion conspicuity
- Improves diagnostic confidence
- May help reduce the number of repeat series

90% said:

- May allow for prescription changes to increase spatial resolution
- Images are easier to read, can be read quicker and lead to reduced eye fatigue

4 out of 5 radiologists agree:

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