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CANADIAN
# Healthcare Technology

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PHOTO: SONIA CACOILO

# Ontario and feds fund flu vaccine production plant

In an effort to restore Canada's ability to produce its own vaccines in the event of future pandemics, the governments of Ontario and Canada partnered with Sanofi Pasteur on a facility in Toronto that will manufacture influenza vaccines. Together, the partners are investing nearly $1 billion, with Sanofi contributing additional funds for the training of research and development staff. **SEE STORY ON PAGE 6**

## Command centre in Montreal monitors an entire region

**BY NORM TOLLINSKY**

A new Command Centre at Montreal's Jewish General Hospital (JGH) is likely the first facility of its kind in Canada – and possibly in North America – to gather and display data about an integrated healthcare network.

Hospital staff in the Command Centre, or C4 as it's called, are able to oversee and expedite patient flows and transfers within West-Central Montreal's Centre Integré universitaire de santé et de service sociaux (CIUSSS).

One of five integrated healthcare networks in the city, the West-Central Montreal CIUSSS encompasses a total of 34 healthcare facilities and services, including the JGH, five long-term care homes, three rehab hospitals, community clinics, outpatient services and home care.

"Before we had the Command Centre, decisions were made in silos, and if you didn't have the right information, you had to call somebody or send an email and wait for a response," said Dr. Shannon Fraser, medical director of the Command Centre and chief of General Surgery.

> **The first-of-its-kind centre can monitor patient flow and other data at multiple facilities.**

"The Command Centre is now the hub that brings together the people with the right information to make decisions much more efficiently and much quicker, and where we're able to address any barriers or issues that come up. That didn't exist before. We were working in our own little space and when we hit a wall, we'd have to call each other. Now, we can make decisions in minutes and hours, not weeks and days."

"The concept of the Command Centre is well known in other industries, including the military, NASA and airport flight control," noted Amanda Babbit of Maisha Labs, a health tech company with offices in Montreal and Tel Aviv that provides the JGH with technical expertise.

"It has proven effective in critical situations, especially where decisions have significant outcomes and where the environment

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# Command centre in Montreal monitors integrated healthcare network

CONTINUED FROM PAGE 1

is changing rapidly. Healthcare is one of them, so our goal is to allow the team in the room to receive and react to information quickly to facilitate efficiencies where we might not have been able to before."

Screens within the Command Centre display bed board information and allow staff to drill down to individual patient data "if, for example, we're trying to direct a patient at the end of their care phase to an appropriate spot for their next phase of care," said Dr. Fraser.

Command Centre staff are able to see the number of patients waiting in the Emergency Department for acute care beds, alternative level of care (ALC) patients waiting for transfer out of acute care, patient length of stay data, and capacity information in the long-term care and rehab facilities.

Before the COVID-19 pandemic, the JGH had more than 60 ALC patients at any given time. By February 15, with the Command Centre in operation, the hospital had only 22 ALC patients taking up acute care beds.

In addition to inpatient rehab and long-term care, Command Centre staff are able to direct patients to virtual rehab at home, said Mary Lattas, associate director of Rehabilitation and Multidisciplinary Services.

With key people from different departments in the same room with all the information at their fingertips, it's much easier to match demand and capacity.

An artificial intelligence (AI) algorithm developed by Maisha Labs predicts the volume of COVID-19 patients showing up in the Emergency Department and whether they'll be admitted or discharged.

"Predictive analytics can help prevent glitches by giving healthcare teams warning of what's coming," said Babbit. "If the teams are aware in advance that they're looking at higher numbers of COVID patients, they can make preparations ahead of time.

"Another tool that predicts the flow of admitted COVID patients is based on epidemiological data. It predicts which patients are going to need elevated levels of care."

The JGH has made a special effort to sell the concept of the Command Centre to hospital staff "because when we introduce these kinds of changes, there's naturally a little bit of pushback," said Babbit.

Screens at the Montreal command centre allow staff to drill down to the patient level to obtain data.

"People are proud of what they do and aren't always that excited about change. In healthcare, everything we do really matters. It's not like working in a bank or a real estate office. The work we do literally changes peoples' lives.

"You can help someone get healthy, or not, so whenever we come in and say, 'Hey, we have a fancy new tool, we want to change everything,' it's normal for there to be pushback. By bringing them into the Command Centre and saying, 'We have some ideas, what do you think?' That's how we drive holistic change."

Clinicians who might be uncomfortable with patient transfer decisions are able to see the big picture.

"We can explain that a patient can still rehab on an outpatient basis," said Lattas. "We don't need to keep them as an inpatient because we have patients waiting in acute care, including stroke patients who shouldn't be waiting for more than two days for their stroke care. We have to be mindful of that and ensure access for everybody. When it's presented in that manner, they understand better and accept the change."

To help free up beds, the JGH is also operating a virtual ward pilot project for cardiology patients. Using smartwatches and patches from Biobeat, an Israeli health tech company, the hospital is able to remotely monitor patients who may be at high risk for complications.

The devices measure blood pressure, oxygen saturation, heart rate, respiratory rate, temperature and stroke volume, allowing staff in the Command Centre to keep an eye on patients beyond the walls of the hospital.

If there is an issue, clinicians can intervene to prevent an Emergency Department visit or hospitalization.

The Command Centre, or C4 as it's called, initially operated in the hospital's boardroom, but relocated to a permanent space in early April. Funding was provided by the Jewish General Hospital Foundation.



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# Eastern Ontario health network introduces bilingual Patient Portal

Serving the Greater Ottawa area, the six healthcare organizations that make up the Champlain Association of MEDITECH Partners (CHAMP) knew that connecting with patients in their native language was essential to achieving positive outcomes.

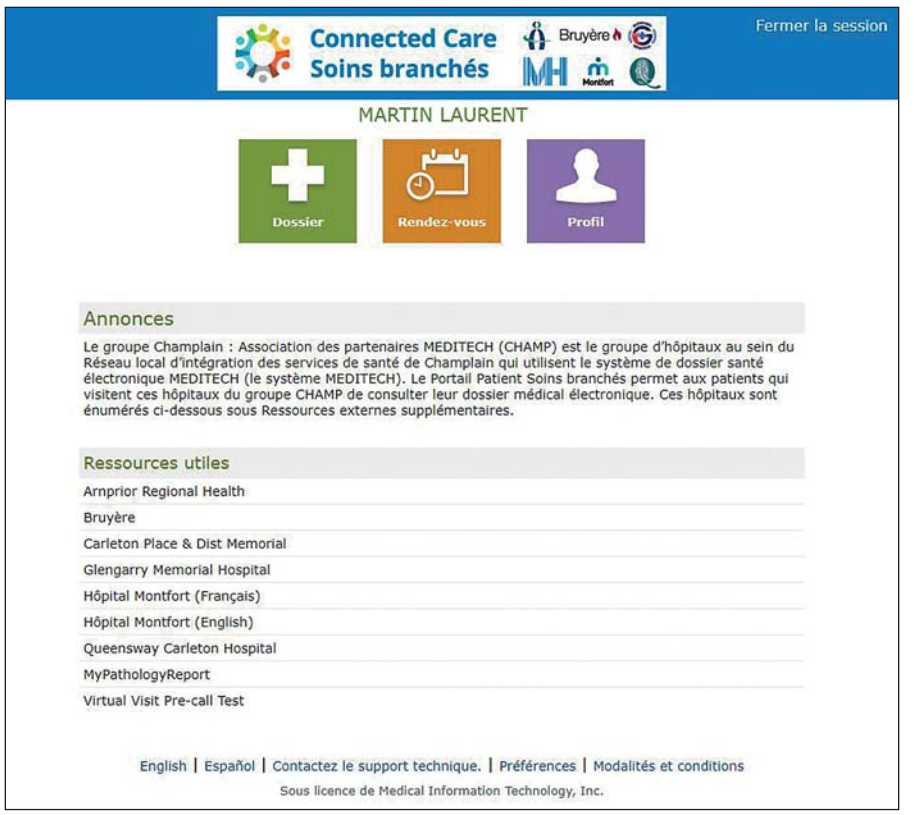
As several of the organizations, including Bruyère, Hôpital Glengarry Memorial Hospital, and Hôpital Montfort, have a large percentage of patients who identify as Francophone, it was imperative that their patient portal could serve both the French-speaking and English-speaking communities.

In order to meet the needs of their entire patient population, the partnership initiated a project to develop a French language version of their MEDITECH portal.

"Even though the content of the Electronic Health Record is sometimes in English – for continuity of care with our community partners – offering our patients a French interface was non-negotiable," said Hôpital Montfort CEO Dr. Bernard Leduc. "By collaborating with MEDITECH, we were able to make this option available."

Led by MEDITECH's Patient Engagement team, the French portal project was initiated in June of 2020 and through its agile development method took less than six months to complete. The EHR provider drew from its experience developing a Spanish portal, which is currently in use.

MEDITECH's development process entailed creating a tool to import French translations into the EHR, as well as working with its French speaking staff members to review the translations, and manually translating some of the portal content.




"When our portal went live in January 2021, it was available in both French and English, which is essential as part of our mandate to serve our entire community," said Dr. Leduc. "It's a convenient tool to help them monitor their conditions, while also strengthening their connections with providers and with our healthcare organization."

As the CHAMP members are on a shared system, any of their Patient Portal users may select French or English as their primary language. They can use it to view results and provider notes, and to register and check in for appointments through the portal.

"This was an exciting project for us to develop with Hôpital Montfort and CHAMP," said MEDITECH Vice President Leah Farina. "Healthcare organizations are continually looking for ways to engage with patients and the Portal is often the first opportunity to connect. We are pleased to be able to support CHAMP's efforts to reach their French speaking population."

CHAMP is a cluster of hospitals that partnered to deliver enhanced patient care with Expanse, MEDITECH's web-based EHR. In addition to the organizations listed above, CHAMP also includes Arnprior Regional Health, Carleton Place & District Memorial Hospital, and Queensway Carleton Hospital.

As MEDITECH is Canada's most widely used EHR, development of a Francophone patient portal was seen by the company as part of its ongoing commitment to support the unique needs of Canadian healthcare. Learn more about how MEDITECH is connecting communities across Canada by visiting https://ehr.meditech.com/global/meditech-canada.

# St. Joseph's found an effective tech solution for COVID-19 screening

**BY HILLARY MAXWELL**

As the global pandemic took root early in 2020, St. Joseph's Care Group (SJCG) – a multisector healthcare provider located in Thunder Bay, Ontario – faced a widely shared dilemma: how do we efficiently screen those entering our facilities for COVID-19 exposures and symptoms?

"We needed a solution that would be easy-to-use, quick to deploy and reliable. It had to be accessible to our clients, visitors, as well as our 2,400 staff, for use at multiple sites across our city," said Tracy Buckler, SJCG's president & CEO.

As it turns out, the solution was at their fingertips.

The organization had already been using REDCap (Research Electronic Data Capture) a secure, web-based software platform designed to support data capture for research studies.

It provides an intuitive interface for validated data capture; audit trails for tracking data manipulation and export procedures; automated export procedures for seamless data downloads to common statistical packages; and procedures for data integration and interoperability with external sources.

Not-for-profit institutions with appropriate technical infrastructure (i.e., the ability to manage server installation, maintenance, and user support) are eligible to join the REDCap consortium to gain free access to the software (projectredcap.org).

At SJCG, the Centre for Applied Health Research (CAHR) had joined the REDCap consortium in 2012, and was using the software to collect and manage research and evaluation data.

It was also used as a platform for SJCG operational activities, such as learning modules, event registration, and consent forms.

So, when the pandemic evolved, it was easy to see how REDCap could accommodate the screening challenges that lay ahead. Staff within Communications, Engagement & Client Relations and the CAHR were able to quickly deploy a suite of four tools to screen the organization's staff, visitors, clients, residents, and tenants.

Each tool comprises a series of online survey-type questions, requiring around a minute to complete to generate a real-time pass-fail result before entering a building.

When the tool's URL is saved to the home page of a smart device, it functions much like an 'app', meaning end-users may utilize a personal device to self-screen, and display their result at a screening checkpoint.

Quick response codes posted outside all facilities and posted publicly online make the tools easily accessible. Checkpoint screening staff at each site use tablets to complete screening for anyone who does not have access to a smart device.

The tools use adaptive logic to support screening guidelines, which can vary by factors such as job type (e.g., clinical vs. non-clinical), location (hospital vs. long-term care homes), sector (varying legislative requirements), and outbreak activity.


Embedded notification frameworks enable workflow automation for activities like monitoring failed screens (email notification to Occupational Health and Wellness) and non-compliance (audit process for mandatory staff screening).

At an Incident Management level, the team accountable for pandemic response have access to empirical data to inform decision-making, such as monitoring access to sites in determining visiting restrictions or anticipating personal protective equipment demand.

While stored on local servers, the PHIPA-compliant database is also accessible online, meaning contact tracing and other basic reporting activities are performed easily from any location, on any type of device.

The ability to work outside the network is possible, with rapid updates when changes to the screening questions or logic are required.

As word of the tools spread within the healthcare sector and the need for screening support became apparent, SJCG was able to respond by providing 15 healthcare agency partners across the province of Ontario with complimentary customized screening tools. To date, these partners have completed nearly 1 million screens. Combined with screens completed at SJCG sites, more than 2 million screens have been conducted to date.

*Hillary Maxwell is the Research Coordinator at the Centre for Applied Health Research (CAHR). The CAHR conducts high quality research, engages in knowledge translation, and supports St. Joseph's Care Group in the creation of new knowledge relevant to Rehabilitative Care, Seniors' Health, and Addictions & Mental Health (cahr.sjcg.net).*

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# Kingston team providing endovascular coiling of brain aneurysms

KINGSTON, ONT. – Driven by her passions for caring, leading and learning, Dr. Donatella Tampieri, an interventional and diagnostic neuroradiologist at the Kingston Health Sciences Centre, has improved patient outcomes by providing innovative services closer to home for patients living with a brain aneurysm.

Endovascular treatment of intracranial aneurysms using platinum coils was developed in the late 1980s by Dr. Guido Guglielmi at the University of Los Angeles in California. Since that time his technique has evolved and currently represents the preferred way of treatment of most intracranial aneurysms over the classical surgical technique.

Endovascular coiling is a minimally invasive technique, which means an incision in the skull is not required to treat the brain aneurysm. Rather, a catheter is used to reach the aneurysm in the brain. During endovascular coiling, a catheter is passed through the groin up into the artery containing the aneurysm. Platinum coils are then released. The coils induce clotting (embolization) of the aneurysm and, in this way, prevent blood from getting into it.

"The terminology is now referred to as platinum detachable coils, but basically the principle is the same as Dr Guglielmi developed," said Dr. Tampieri, a member of KHSC's Department of Diagnostic Radiology. "I did my first animal lab coiling with him in UCLA in 1993. We now have available numerous other devices such as stent, flow diversion, balloons and flow disruption tools to treat all sorts of aneurysms which could not be treated easily just with platinum coil."

Technologist James Jung (l), Dr. Ben Mussari (centre) and Dr. Donatella Tampieri perform a coiling procedure.

PHOTO: MATTHEW MANOR

The program did not exist at KHSC, since the expertise was not available before the arrival of Dr. Tampieri.

"Ultimately you need a comprehensive team to achieve success, and the team is usually much larger than what the patient sees with his or her own eyes," said Dr. Tampieri. "For example, the department of radiology, neurosurgery, critical care, anesthesiology and others form a partnership in care and the care provided by neurosurgeons is key to ensuring this treatment succeeds."

Since her recruitment at KHSC, and with the support of the Department of Radiology, Neurosurgery and others, KHSC established the program and obtained the Ontario Ministry of Health designation as a coiling centre.

"Without this amazing facility in southeastern Ontario, I doubt that my outcome would have been as positive," said coiling patient Terri-Lee Kelly. "If I had to go farther for care, my outcome may not have been the same. I received wonderful care at KHSC. Dr. Tampieri explained that the use of coils was an innovative procedure that had been put in place by her and her team and was a much less invasive technique than open conventional surgery."

The endovascular treatment of aneurysms (coiling) is considered to be a much less invasive technique than open conventional surgery, since it does not require craniotomy.

Long-term randomized studies (ISAT) have demonstrated less morbidity and fewer long-term side effects with endovascular technique for ruptured aneurysms – such as less incidence of long term seizures – when compared with conventional surgery.

In addition, endovascular treatment enables treatment of aneurysms in locations not accessible by conventional surgical treatment.

"Since my arrival at KHSC we have treated 42 patients," said Dr. Tampieri. "Initially we have treated only ruptured aneurysms, but the program will grow step by step and soon we will start to also treat un-ruptured aneurysms. These are aneurysms found accidentally which have the potential to bleed based on their location, size and shape. We estimate that when our program is fully mature, we will treat approximately 30 to 45 cases per year."

The impact of these advances can ripple through entire communities, in southeastern Ontario and beyond.

"Although I don't remember the first few weeks, my family said they were treated with compassion and respect and my progress was conveyed to them in a timely manner," said Terri-Lee Kelly.

"COVID-19 made it impossible for my family to visit, but the team kept them well informed and explained to them all the steps that were being taken for my recovery. I had amazing care and always felt that my recovery was of utmost importance to the team. I want to thank Dr. Tampieri and the KHSC team for giving me my life back."

# Sanofi Pasteur to create influenza vaccine facility in Toronto

TORONTO – Three levels of government – federal, provincial, and municipal – have thrown their support behind Sanofi Pasteur in building an "end-to-end" influenza vaccine manufacturing facility in Toronto. Together, the partners will invest nearly $1 billion to get the site up and running, which is expected by 2027.

For its part, Paris-based Sanofi will invest more than $455 million and will create 165 new skilled jobs and maintain 1,100 others.

The federal government is investing $455 million, while the government of Ontario is contributing $55 million, making this a $925 million project. In addition, Sanofi will also invest at least $79 million a year, over eight years, to fund Canadian research and development.

Once it is operational, Sanofi will be able to manufacture influenza vaccines at population scale at the Toronto facility. It will have the capacity to produce enough vaccine doses to support the entire Canadian population within approximately six months of the World Health Organization (WHO) identifying a pandemic influenza strain.

The Sanofi site is located at the north end of Toronto, on the former Connaught Labs campus. Connaught Labs was sold to Sanofi in 1989. At the announcement of the new project, federal Innovation, Science and Industry minister, Francois-Philippe Champagne, said: "This is a landmark investment, and everyone is winning today. Scientists and researchers will rebuild the ecosystem of biomanufacturing in Canada, and Canadians will become more resilient."

The new project is being constructed on a solid base of local expertise, as Sanofi Pasteur's Toronto Site currently manufactures vaccines annually for pertussis, polio, diphtheria, and tetanus, among others, for more than 60 countries worldwide – including Canada.

Speaking at the announcement, Ontario Premier Doug Ford said, in regard to influenza vaccines, "We are never going to have to rely on any country or leader – we'll be self-sufficient."

The premier noted, "Throughout the pandemic, we've been making strategic investments to develop made-in-Ontario PPE, so we would be less reliant on others. We're doing the exact same thing today with this great announcement about vaccines."

The project is part of an effort to rebuild Canada's ability to produce its own vaccines in cases of pandemics. Since March 2020, the federal government has already announced investments of $569 million to spur advances in vaccines, therapies and bio-manufacturing projects, many of them to combat the novel coronavirus, or COVID-19.

For its part, influenza virus kills or sickens millions of people around the world each year. It is critical to have access to a reliable supply of vaccines, especially in case an especially deadly variant of the flu virus emerges.

Founded as the Connaught Antitoxin Laboratories and University Farm in 1917, Sanofi Pasteur's Canadian facility has supported numerous scientific breakthroughs while making significant public health contributions. One hundred years ago, the Toronto site was home to some of the initial research for the discovery of insulin, as well as large-scale commercial insulin production for all of Canada until the 1980s.

> **The partners will invest nearly $1 billion to get the site up and running, which is expected by 2027.**

It also produced an antitoxin for diphtheria, the leading public health threat to Canadian children in the early 1900s and was an important partner in the eradication of polio in North America and smallpox around the world.

Connaught was merged with Institut Mérieux in 1989, and in 1999 it was transformed into the Canadian component of Pasteur Mérieux Connaught, owned by Rhône-Poulenc. A series of acquisitions since then have transferred ownership of what used to be the Connaught Laboratories to the global vaccine business of Sanofi.

In 2018, Sanofi made another historic investment at the Toronto Site, to establish one of the most advanced vaccine bulk manufacturing facilities in the world. At the time, this was the largest investment ever made by Sanofi globally into a single facility, more than $500M (CAD).

This manufacturing facility will produce seven antigens: five-component-pertussis, plus diphtheria and tetanus, to help meet global demand for more life-saving vaccines for children and adults worldwide. License approval for Canada and the United States is expected in 2024 for the five-component-pertussis and in 2025 for diphtheria and tetanus.

In addition to the 1,225 highly skilled jobs created and maintained in Canada,

CONTINUED ON PAGE 14

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# CAN Health Network and MEDTEQ aim to drive healthcare innovation

BY NORM TOLLINSKY

Knowing which door to knock on and who to call has always been a challenge for health technology companies, but that's changing as more healthcare organizations are laying out the welcome mat for Canadian startups. Much of the credit goes to organizations like the CAN Health Network and Montreal-based MEDTEQ.

Billing itself as a demand integrated marketplace, the CAN Health Network is a national partnership of hospitals, health authorities and private healthcare organizations. CAN Health West includes Vancouver Coastal Health, Alberta Health Services, the Saskatchewan Health Authority and Shared Health Manitoba, while CAN Health Ontario South includes hospitals in the Greater Toronto Area, Hamilton, Kitchener and Ottawa, along with private healthcare organizations SE Health and the Prism Eye Institute.

An Atlantic network is in the process of being launched with five healthcare organizations, and plans for networks in Quebec, Northern Ontario and the Territories are in the works.

MEDTEQ has been around for close to a decade and operates on a different model, but has a network of clinical sites in Quebec along with Alberta Health Services, Vancouver General and Ottawa Hospital. MEDTEQ links healthcare organizations and health technology companies through its Beachhead program to accelerate the adoption of new technologies. It also boasts Beachhead sites in France, Germany, Israel and the U.S. to facilitate export sales.

The 16 healthcare organizations, or Edges, currently encompassing the CAN Health Network have more than $30 billion of buying power, according to Dr. Dante Morra, chief of staff at Trillium Health Partners and chair of the CAN Health Network.

"The Edges tell the marketplace what they want to buy," he explained. "That's very valuable to Canadian companies because they're not guessing what to sell. They take Canadian companies and attach them to the organization to solve a problem.

"For example, Trillium Health Partners may have an agency and overtime scheduling issue for nurses and can't find a solution elsewhere in the marketplace, so it takes a company and attaches it to that problem in a warm environment. It also cheers for that company because every month all the Edges are talking about the companies they're working with."

When a solution is developed and procured, all of the other Edges can also elect to procure it.

Seven of the nine projects completed to date have resulted in sales. Some have resulted in sales to multiple Edges, and one engagement by EZ Referral, an Edmonton-based company, facilitated a significant export sale.

The CAN Health Network has worked with 17 health technology companies to date. "Some of them knock on our door," said Dr. Morra. "If they're not quite ready and need early stage assistance, we send them to an accelerator. Some of them come to us from one of the Edges. Others come to us through MaRS, Communitech, Ottawa Invests or ICUBE. In some cases, we'll issue an RFI. We'll go to the market and look for companies to solve a specific problem."

EZ Referral was the brainchild of Dr. Denis Vincent, a family doctor in Edmonton, who developed an online referral system that does away with fax machines.

"Dr. Vincent's nightmare happened six years ago when a patient's referral from an Emergency Room doctor to a surgeon was lost," said EZ Referral president Peter Jurisic. The patient, complaining of stomach pain, had an ultrasound that revealed a mass on her gall bladder, but the surgeon that the fax was sent to was on a four-month sabbatical. "Because of the missed fax," said Jurisic, "this 33-year-old mother of three died from cancer."

Dr. Dante Morra, chair of the CAN Health Network

Diane Côté, CEO of Montreal-based MEDTEQ

François Bergeron, VP Partnerships at MEDTEQ

The EZ Referral solution, designed for use "by psychiatrists, oral surgeons and other specialists, loops in the patient between the sending and receiving offices. When a referral is sent, all three parties know. When an appointment is booked, everyone knows. When a patient confirms, everyone knows. There is no more miscommunication and no more lost referrals," said Jurisic.

**Seven of nine projects at CAN Health Network have resulted in sales, including a significant export contract for one firm.**

EZ Referral had numerous customers prior to partnering with the CAN Health Network, but its project with the Prism Eye Institute in the Greater Toronto Area helped it expand and customize its offering for eye clinics and eventually secure a sale to a California-based clinic with 12 locations.

"If you're a Canadian company and you're knocking on doors in Texas or California, the first question they'll ask is, 'Who are your customers in Canada?' If you can say your customers include the University Health Network, Alberta Health Services and Vancouver Coastal, that's a huge advantage," said Dr. Morra.

Furthermore, "the Edges are cheering for these companies, so they will often call their friends in the U.S. or elsewhere and say, 'This is a great company.' That's what the network does."

Verto Health is another health technology company that has benefitted from its association with the CAN Health Network. Established in 2017, Verto Health bills itself as a leader in connection and communication software for interoperability and care coordination. The company started with four deployments in 2017 and now has 60 customers.

It employs Digital Twin Technology to quickly and cost-effectively bring together multiple health system data sources to support a patient's journey beyond the brick-and-mortar confines of a single organization.

"Transitions in care are actually the highest risk points throughout any care journey," said Verto Health CEO Michael Millar. "With our technology, the data always flows with the patient.

"Digital Twin Technology is a methodology where you can amass all the data into one central entity or one central data store and deploy smart clinical decision support or AI to process it so it's meaningful for a clinician."

Verto Health joined the CAN Health Network in September 2020 and was working on a project related to its core technology when it recognized the need for a solution to manage appointment booking for COVID-19 assessment centres.

First adopted by Unity Health in Toronto, the system developed by Verto Health allows patients to book an appointment and conduct a self-assessment online. Patients receive appointment booking confirmations and reminders via email or text message, while hospitals have access to a dashboard allowing them to track patient flow and resource allocation.

A further challenge arose when vaccinations began arriving and hospitals, public health units and other healthcare organizations braced for yet another appointment booking challenge.

Once again Verto Health stepped in with a solution. Unity Health went digital from the start. Other hospitals, including London Health Sciences, weren't as fortunate, thinking they could make appointment bookings on the phone.

London Health Sciences organized a call centre with six staff, but "very soon after opening, we realized that six was not nearly enough because we were inundated with calls," said clinical strategist Jeanette Fidler. "We then went to 20 staff manning the phone lines, grabbing people from wherever we could, but wait times still averaged 45 minutes so we determined this was not going to be manageable."

With the switch to Verto Health's self-scheduling system, London Health Sciences was able to make do with four staff in its call centre.

The vaccine administration process is complicated by the unpredictability of the supply chain, explained Millar. "You'll have days when you'll have 200 doses more than you thought. Then the harder circumstance is that maybe you'll have fewer doses than you thought, so now you have to take people that you were promising to vaccinate and shift them to another day. Compound that with the fact that once they come in, you book them for their second dose. Well, at the beginning of the pandemic, it was an interval of two weeks for the second dose. Then it was 21 days, then 35, and now it's 112.

"We just ran a script last night that rebooked 12,000 appointments. Rebooking 12,000 appointments would have taken 125 clerical days for this one organization to reschedule. It's really rewarding to solve problems like this because they create a real strain for providers, and when you strain providers, it ends up impacting patients as well.

"When we run a migration script to reschedule all 35-day appointments to 112 days, we feel joy because we know that's a clinical worker focusing on vaccination optimization rather than phoning people for four days."

According to Millar, 40 sites are using Verto Health's COVID-19 assessment and vaccination booking solutions.

The CAN Health Network helped to spread the word about Verto Health's capabilities because participating healthcare organizations "talk to each other and collaborate, so when they have a problem and someone has a solution, they're not shy about sharing it with everyone else."

Funded by both the Quebec and the fed-

CONTINUED ON PAGE 22

# 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.

AGFA HealthCare

**enterpriseimaging@agfa.com**

www.agfahealthcare.com

# Virtual care program at Women's College Hospital to be expanded

BY DIANNE CRAIG

TORONTO – The effort to build a "virtual hospital" platform at Women's College Hospital received a big boost earlier this year when the TD Ready Challenge awarded it $1 million. The TD program is supporting initiatives that deliver accessible, equitable care to vulnerable and remote populations – especially those affected by COVID-19.

"We are thrilled to have the opportunity to work with TD with a million-dollar grant," said Sara Byrnell, vice president, Philanthropy and Partnerships, Women's College Hospital. "It will increase our IT infrastructure, help us introduce new digital tools, help with a redesign of clinical care and evaluation of those tools to ensure we're providing the best possible care."

Women's Virtual is designed to "reimagine how healthcare is delivered, making it more accessible, responsible and equitable. "We think about a Mom living in a rural community who has just had a baby and requires access to our health services. Women's Virtual provides new options not available to her previously," said Byrnell, adding they can also provide translation services. "In a holistic sense we are saving her time, money, and the stress of driving to the hospital."

A key part of the response of Women's Virtual to the pandemic is COVID-Care@Home, which assists both primary care providers and patients with real-time support through phone or video visits, as well as practical tools providers can use to monitor their own patients.

For example, remote monitoring of patients with COVID-19 gives patients the educational support they need while also serving as an alert system should a patient's health worsen. If a problem arises, care providers are quickly notified and actions can be taken.

Dr. Payal Agarwal conducts a virtual visit with a patient, providing safe, effective care during the pandemic.

Another component of the hospital's digital approach is the integration of electronic health records. "We are only one of three hospitals integrating with Apple's MyHealth records," said Byrnell.

Patients can download an app to their phones for self-monitoring and disease management. It ensures a continuous and direct connection to the virtual hospital care teams and can alert them if a patient's condition changes. Byrnell explained, "If a patient is experiencing worsening symptoms, they can hit a button on their app that alerts their care-team and they can schedule a virtual visit."

Another tool is the hospital's digital questionnaires that patients fill out in advance of an in-person visit, saving time and trouble for providers during the encounter.

As part of its mission, Women's College Hospital is also targeting patients that are difficult to reach, and who sometimes fall through the cracks of the regular system.

"Through this grant we are also going to be able to deliver care to people who are precariously housed, refugees, and those experiencing domestic violence and in family shelters," said Byrnell. "This works via the COVIDCare@Home program, linking people to doctors who don't have a family doctor. They will be connected virtually with a physician who will care for them as they recover from Covid."

The focus on vulnerable populations involved creating one of the first digital support systems for Indigenous communities that are experiencing COVID. "It provides a holistic framework for safe wellness and wisdom," said Byrnell, adding that Women's Virtual is very much about working with Indigenous communities, respecting their traditions, and working directly with them to provide support.

Next steps for Women's Virtual include expanding its reach and using it as a model for other areas across the country and beyond. Byrnell said there are plans "to spread, scale, and evaluate all of their work; to bring the solutions we've developed to other hospitals."

For its part, the TD Ready Challenge is awarding $10 million, in total, to 15 leading North American organizations to help address existing social inequities in communities that have been disproportionately impacted by COVID-19.

This year, TD expects the winning programs, including Women's Virtual, will revolutionize the Canadian healthcare system – particularly by offering needed medical services to our most vulnerable populations, in our most vulnerable areas of Canada. "Even in March and April [of 2020], we saw that certain populations were being impacted harder," said Alicia Rose, TD's Manager of Strategic Initiatives.

"Populations that have already experienced marginalization were really impacted by the pandemic," she said.

Asked why they selected Women's Virtual for one of the $1 million grants, Rose said a key reason was that Women's College Hospital identified problems regarding equity in healthcare access and recognized the digital divide contributed to limited access to healthcare during the first wave of the pandemic.

"We were looking at how they were implementing technology and artificial intelligence, mobile tools, and how they were improving ambulatory care," said Rose.

# Building interactive healthcare connections around the care of patients

With COVID-19 as a catalyst, healthcare systems across Canada began leveraging tools that facilitate the delivery of efficient, high-quality medical attention. The tools have enabled collaboration and information sharing across care teams, making possible widespread population health surveillance and remote access to care.

While devastating in so many ways, the pandemic has allowed healthcare leaders to explore the present and future power of technology – to meet immediate needs in response to COVID-19 and to affect significant, sustainable change over the long run.

As digital health continues to see accelerated use across Canada, collaboration on all fronts remains a top priority. Collaboration among all stakeholders – healthcare professionals, patients, caregivers and system administrators – promotes an important factor to team-based care: improved communication and optimized information sharing.

Health records can be powerful information-sharing tools, but many continue to function within their own silos. While they all help manage and track patient health information, they seldom enable two-way communication between patients and physicians or even between care team members.

Change is fortunately on the horizon. Advanced platforms that facilitate team-oriented workflows and include fully integrated engagement tools help reduce the burden of documentation and administrative work for healthcare professionals.

More importantly, features such as appointment booking capabilities, automated reminders, secure encrypted messaging and video visits, and intake assessment tools, empower patients to play a more active role in their healthcare journey and streamline processes for physicians, enabling them to focus on what truly matters: patient care.

"When patient engagement is integrated through every functional component of the process, it ultimately benefits the broader healthcare system," says Dr. Damon Ramsey, chief medical informatics officer and vice president of collaborative health at TELUS Health. "Solutions like our Collaborative Health Records, which support regular, meaningful engagement from patients, help clinicians better understand needs, desires and pain points across the healthcare continuum and allow us to take a more proactive approach to care."

Digital technology can also support improved communication between healthcare professionals, who often use different systems to manage health information. In many instances, these systems don't talk to each other, preventing care teams from sharing critical information that could impact patient outcomes. Solutions that connect these disparate systems while ensuring data privacy and security can facilitate collaboration, integration and the continuity of care. Such platforms enable the seamless flow of information from one system to another, giving all key players a full view of a patient's health.

Dr. Damon Ramsey

For instance, the TELUS Health Exchange is an open electronic communications platform developed with a security-by-design philosophy that most recently enabled direct communication between the company's employer-focused virtual care solution with the 30,000 TELUS Health EMR users across the country.

This type of advancement enables healthcare professionals to take a holistic, data-driven approach to treatment. Research conducted by Health Quality Ontario reports that continuity of care has been linked to fewer hospital and emergency department visits as well as improved patient satisfaction, especially among those living with a chronic illness.

Collaborative and integrated tools help break down barriers to make way for a more complete healthcare experience, and ultimately a more sustainable, better connected ecosystem.

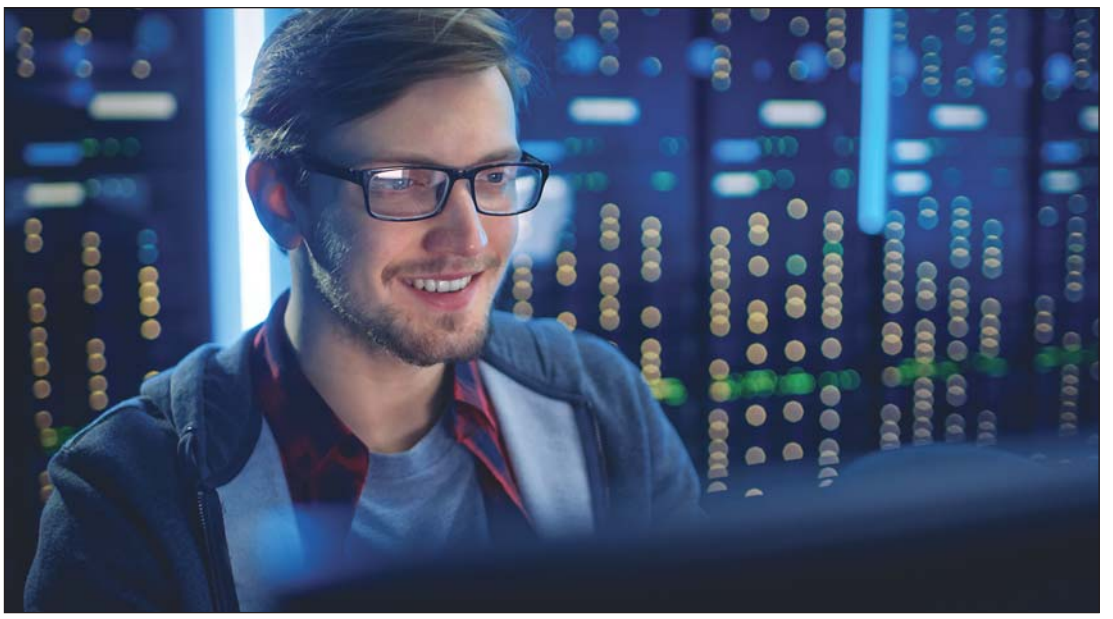
"While silos continue to exist, we're beginning to see more examples of positive collaboration across care settings," Dr. Ramsey adds. "Technology is a means to an end; what it enables is far more important. It allows us to deliver better care. Now that we've experienced the benefits, there is no going back."

# NLCHI shifts 1,700 healthcare workers to remote work in five days during COVID-19

## The organization used Microsoft's cloud to scale its computing power up and down to reduce its costs

The Newfoundland and Labrador Centre for Health Information (NLCHI) supports healthcare organizations across the province with IT services. In response to COVID-19, the organization had to enable remote work quickly. In five days, NLCHI deployed Windows Virtual Desktop to 1,700 healthcare workers, who connect to their Windows desktops and apps with their own devices.

The province is divided into four regional health authorities (RHAs): Labrador-Grenfell Health, Central Health, Western Health, and Eastern Health. NLCHI's staff of 175 supports 20,000 healthcare workers with solutions such as hospital information systems, an electronic health record (EHR) system that authorized healthcare providers use to securely access essential patient data, and an electronic medical record (EMR) program that is digitizing clinician offices across the province.



**Moving to remote work and the cloud:** In early 2020, roughly 400 of the province's 20,000 healthcare workers regularly worked remotely using VPN connections and corporate laptop computers. Thanks to its e-health focus, NLCHI had recently established a single Microsoft 365 tenant for itself and the four RHAs, including Microsoft Teams. The rest of its IT infrastructure was mostly on-premises.

In early March 2020, when the province confirmed its first cases of COVID-19, NLCHI had to respond quickly to keep healthcare services running.

> **"We've advanced our capabilities quickly, achieving in nine months what would have taken us 5 or 10 years to do previously," says Robert Drover.**

At the same time, it had to configure new COVID-19 intensive-care unit (ICU) wings and deploy solutions in long-term care facilities (NLCHI provided 500 iPads and various apps to help patients connect with family and health providers).

Robert Drover, Director of NLCHI, says, "Case counts and admissions accelerated overnight. It was a critical situation and we needed to enable remote work for as many workers as possible; staff responsible for acquiring personal protection equipment are just as essential as ICU physicians and nurses to keeping services running."

**Fast deployment and minimal training requirements:** NLCHI contacted Microsoft, which suggested Windows Virtual Desktop for providing remote access. Rodney Keough, Data Center and Unified Communications Manager at NLCHI, recalls late night and early morning calls with Microsoft to determine how to set the service up for NLCHI and the four RHAs with their different requirements. "Robert contacted me on a Sunday night. We built out the main controllers in Microsoft Azure by Thursday morning, when we brought on the first pilot group from Eastern Health. In five days, we had about 1,700 people using the new Windows Virtual Desktop platform, with peak usage at 3,700 people."

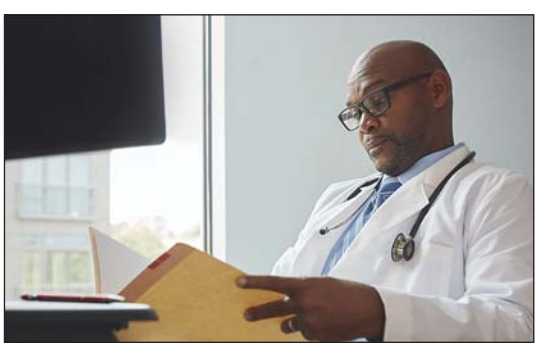
To reduce its resource requirements, NLCHI used Windows 10 Enterprise multi-session, a Remote Desktop Session Host that allows multiple concurrent interactive sessions. "Instead of two users per CPU, we can enable 32 users to connect to one session host, and all get equal performance and a full desktop experience, which is tremendous," says Keough. "It cuts our costs by a factor of 30."

NLCHI created materials explaining how employees could access their remote desktops by using their own personal devices. Keough says, "Beyond creating an announcement email and a couple support documents, there was no more training required. The experience is intuitive, just like the desktop workers are already used to."

NLCHI also worked with IT provider Nerdio to set up Nerdio Manager for Windows Virtual Desktop – a solution to help automate, optimize, and secure Windows Virtual Desktop deployments. The organization used the product, which works with NLCHI's four Azure Active Directory P1 deployments, to create an image for itself and for each RHA, and automatically deploy them to each domain. "We also deployed servers with credentials and connected them to Azure file stores quickly using the Nerdio interface," says Keough.

To make its Azure spend more efficient, the organization uses Azure Reserved Virtual Machine Instances to manage costs across predictable workloads. It uses autoscaling in Nerdio Manager to handle its fluctuating needs (at the end of each workday, the organization scales down from 30 servers to just one). "The ability to scale down automatically helps us save on compute costs for Azure; that's not something that was available in our traditional datacenter model. We built a sustainable solution that's fiscally responsible and will help us recover some of its costs," says Keough.

**Timely support and improved collaboration:** The level of support from Microsoft impressed Drover. "Faced with learning and deploying a new technology practically overnight, it was a huge help to have Microsoft guiding us. Every time I called, someone was there to answer my questions. Microsoft also offered training for my IT staff – that training is vital to how we build new competencies."



The organization used Windows Virtual Desktop to provide remote access to Microsoft 365 and other apps to help workers collaborate effectively. Its executives also used Microsoft Teams live events to regularly communicate with more than 20,000 staff. Keough says, "Working together with an integrated solution like Microsoft 365 and Teams is tremendous. Workers couldn't take their office phones home, but with Teams they can share files or communicate with colleagues with chat, voice, and video, or store documents more securely from within a meeting, instead of sending files ahead of time."

**Flexibility, security, and a new direction for IT:** The organization benefits from the flexibility it gained around devices. Keough says, "We don't have to secure workers' computers with encrypted drives and security updates because the devices are just acting like a thin client, in the sense that they're providing the connection to our virtual desktop infrastructure."

NLCHI sees virtualization as an opportunity to rethink how it procures and delivers devices – and provides a desktop experience for workers. The organization won't have to image new computers for remote workers, and it can focus more on identity management and security. Workers won't need different usernames and passwords for various applications but will instead have a single Microsoft identity that IT staff can manage across the environment. Keough says, "Next, we can look at using Microsoft Intune mobile device management across the entire organization, like we're doing for the 500 new iPads."

Drover sees the Windows Virtual Desktop deployment as changing the organization's strategy around what it can achieve. "We've advanced our capabilities quickly, achieving in nine months what would have taken us 5 or 10 years to do previously. We're seeing intrinsic benefits that make us more effective, efficient, and responsive," he says.

# Tips for safeguarding patient data in an era of accelerated virtual care

BY ROSALIND STEFANAC

If there is a silver lining to the pandemic, it's that virtual care is rapidly becoming a viable and more accessible way to bring healthcare treatment to those who need it most.

According to the Canadian Attitudes on Healthcare and Telemedicine Report released in November 2020, 70 percent of Canadians believe virtual care represents the future, especially as COVID-19 makes it more difficult to access in-person healthcare.

But with the rapid deployment of online healthcare resources comes the increased potential for cybersecurity attacks and expensive privacy breaches. According to the global Center for Internet Security, personal health information is more valuable on the black market than credit card credentials or any other personally identifiable information, with the average cost of a data breach incurred by a healthcare agency at US$355 per patient record.

"Hospitals have been providing some form of virtual interaction with patients in the past, even if it's through a portal," said Ira Parghi, a lawyer at Borden Ladner Gervais LLP in Toronto who specializes in information privacy and security issues. But there are a lot of other service providers in healthcare for whom virtual care is "uncharted territory," she adds.

Parghi said many of these virtual care technologies were rolled out quickly during the pandemic, with little attention to the healthcare providers having to use them.

"When you're feeling stressed, as many providers are right now, it's hard because you also need to make sure you're configuring the technology correctly in the first place, so you're not accidentally exposing data," she said. "You also want to make sure your staff feel comfortable with using it properly, so there is a lot to think about."

Getting staff into cybersecurity courses is one way to help ensure employees keep deploying best practices when using these technologies. But Parghi said it's important for providers to consider the patient's perspective in terms of truly understanding what virtual healthcare entails and the inherent risks involved.

To that end, healthcare institutions are encouraged to inform patients ahead of time about the potential risks with virtual care – and to obtain express consent in receiving it. "Now that the widespread rollout has taken place, it's time to pause and consider potential privacy and security risks and how best to manage and mitigate them."

To help organizations do just that, the Information and Privacy Commissioner of Ontario recently released new guidelines for virtual care providers, Privacy and Security Considerations for Virtual Healthcare Visits: Guidelines for the Health Sector. The guidelines advise on the steps providers, including frontline physicians and practical nurses, should take in laying the groundwork for enhancing privacy and security in virtual care.

Ontario Health, a government agency focused on making the province's healthcare system more efficient and patient-centred, said ongoing measures to safeguard privacy include conducting privacy impact assessments and threat risk assessments and developing comprehensive virtual care policies and supporting practices.

"As with face-to-face appointments, patient privacy and health information confidentiality must be protected during a virtual care appointment, and providers must comply with applicable privacy laws," said Sylvie Gaskin, interim chief privacy officer, Ontario Health. "Patients must be informed they can withdraw their consent at any time while participating in a virtual visit."

In partnership with the Ministry of Health, Ontario Health also initiated changes to the Ontario Virtual Care Program to support more choices for virtual visit solutions for healthcare providers.

The provincial standard aims to foster confidence that virtual care solutions meet privacy, security and technical requirements. For a virtual solution to be certified, vendors must meet the standard requirements and agree to participate in additional risk-based verification testing with Ontario Health within one year.

Meanwhile, technology providers like Microsoft are advocating for the need to be thoughtful and deliberate in how virtual healthcare technologies are deployed. "There are some places where innovation needs to go quickly, but there are other places where innovation needs to be thoughtful and disciplined as the way forward," said John Weigelt, national technology officer at Microsoft Canada.

Early on in the pandemic, he said Microsoft decided it would deploy technology solutions during COVID-19 only if they adhered to key privacy principles, such as consent by choice when it comes to data storage and the ability to delete data after its use has been exhausted. "These have really guided all our activities as we move forward and deliver solutions like virtual visits."

For example, Microsoft provides automated tools that allow customers to get a scorecard reading about how well their security has been implemented. "They can watch it over time, and they can really track their progress in terms of some of these critical items."

# Digital health technologies empower patients and improve outcomes

BY DR. CHRIS HOBSON

How do we improve healthcare in Canada, while ensuring patients are front and centre throughout the experience? One clear approach involves using digital health technologies to empower patients, improve processes and enable clinicians to provide the right care, to the right patient, at the right time and in the right place.

It could also improve the provider experience and lead to more efficient functioning of the health system, while reducing costs and improving outcomes.

COVID-19 brought a necessary shift in care delivery, highlighting the power of digital health. Innovations accelerated include telehealth/virtual health, telemental health, remote patient monitoring and home-based care.

Out of necessity we have learned the features, benefits and downsides to virtual care. According to a recent survey of Canadians by Canada Health Infoway, nearly seven in 10 Canadians who sought medical assistance during the pandemic had a virtual visit. As we move toward a post-pandemic world, how can we further use digital health technologies to empower patients, and what benefits can we expect?

**The patients:** As a first step, all patients should have online access to their medical records at every healthcare institution, including access to diagnostic reports; the ability to add information, such as family histories and medications used; and the ability to provide consent and make corrections.

Patients should also be able to access virtual care when they want and need it. According to the same survey by Infoway, eight in 10 Canadians who used health technology in the past year report that they were better able to manage their health and had a better quality of life.

In addition to their medical records, patients should have access to a trusted source of supplementary information to help interpret their records, empowering them to take a more hands-on role and make informed decisions. An example is MyHealth.Alberta.ca, which gives Albertans one place to go for health information they can trust, as well as access to their medical records.

**The providers:** As care shifts to the home and community, alongside expanded virtual care, providers could be assisted by a well-developed structure for remote patient monitoring and community-based support for home care visits; greater use of telehealth consultations, including virtual consultations, with patient symptoms, early diagnoses and histories available; and specially trained support staff to extend the capacity of practitioners.

Additionally, the widespread application of wearable and smart-home devices for monitoring patient health factors, such as cardiovascular data, diabetes readings, and other health markers, all of which will be interoperable with medical records.

According to the same survey by Infoway, nine in 10 Canadians who used health technology in the past year report it saved them time. Digital health technologies like virtual visits can reduce the need for in-person care, saving time and decreasing risk for vulnerable groups. Additionally, widespread use of artificial intelligence (AI) for self-diagnosis, a foundation for facilitating virtual triaging with family doctors and specialists, when accompanied by monitored information, is a basis for referrals without office visits.

Dr. Chris Hobson

**The health system:** Technology can support access to area-wide information on hospital, ICU and specialist capacities. This information would offer patients the option of remaining on a wait list for a local or specific service or choosing to go to another location where the wait list is more convenient.

Optimizing the use of expensive facilities could lead to reduced requirements for acute care beds and greater use of ambulatory facilities. Digital health technologies can also help expand the reach of the health system to rural or remote and underserved populations.

For virtual care to succeed, it requires funding, structured programs, a clear billing model for providers, and combatting perceptions that it is not as efficient as in-person care.

Patients want technology that puts them in greater control of their health and, by shifting to patient-centric care enabled by digital health, there are positive impacts for patients, providers and the health system.

At Orion Health, we are revolutionizing global healthcare so that every individual receives optimal care. We are pleased to be a member of the Infoway Alliance, a community of stakeholders working with Canada Health Infoway to help improve Canadians' access to their personal health information and to digitally delivered health tools and services.

*Dr. Chris Hobson is the Chief Medical Officer at Orion Health*

# CBI Health delivers virtual home care visits, rehab, psychotherapy and more

## The organization has safeguarded 100,000 telehealth appointments with Azure Sentinel and Microsoft Teams

When COVID-19 curbed its in-person treatments and in-home care services, CBI Health moved quickly to enact a plan. Within two weeks, the organization was again seeing clients, including those requiring physiotherapy, occupational therapy, psychotherapy, and more – this time, by using Microsoft Teams.

CBI Health also used Teams to coordinate care with local governments and other organizations, as they worked to handle the influx of in-home clients resulting from the pandemic.

For its part, CBI Health provides rehabilitation, home care, and community health services to people across Canada. Tens of thousands of Canadians rely on these services in order to heal from injuries and go about their daily lives.

Because of the importance of its services, CBI Health has worked diligently for the last few years to assure nothing can disrupt contact between its healthcare professionals and their clients.

In 2018, the focus turned toward disaster response. "We weren't focused on a pandemic, specifically," recalls Cameron Chojnacki, Director of IT Operations at CBI Health. "We were looking for a solution that would help us weather anything massively disruptive, like a natural disaster for instance."

At the time, telehealth was fairly new to the organization. Its clinicians provided almost exclusively in-person care to help clients meet their health goals. Despite this limitation, CBI Health wanted its disaster response solution in place, just in case it had to shift its focus away from providing care in person.

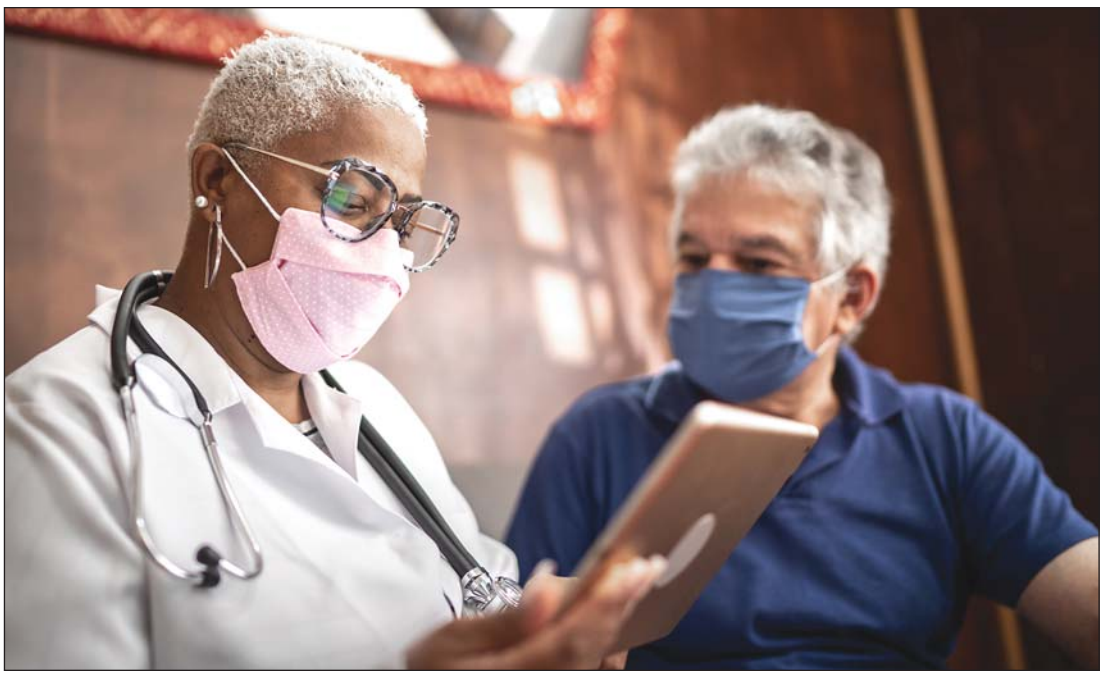
Early in 2020, the catastrophe occurred. As part of a national response to COVID-19, many Canadians had to shelter in place – making in-person appointments an impossibility almost overnight. As hospitals scrambled to remove patients with pre-existing conditions like lung cancer and severe asthma from harm's way, the need for home care rose dramatically.

> **"We were in crisis management mode, and yet we were able to deliver new services through Teams in under two weeks," said Cameron Chojnacki.**

Thankfully for CBI Health and its clients, the organization's forethought paid off. The very same day that Canada issued its stay-at-home order for Ontario, CBI Health had signed an agreement to adopt Microsoft 365, and in particular Microsoft Teams, as its new digital care solution. A signed agreement, of course, is not the same as a fully executed adoption roadmap. The race was on to adapt to a wildly different way of providing services to clients.

**Remote collaborative care:** CBI Health worked quickly to re-establish its continuity of care through telehealth. With the ink still drying on its contract with Microsoft and zero percent adoption, CBI Health swung into action. Aided by Microsoft along with the technology experts at Long View Systems, a member of the Microsoft Partner Network, the organization had its first employees working in Teams within a week.

Less than a week after that, clinicians conducted telehealth appointments in Teams. "As the pandemic rapidly shut down all but the most essential services in March of 2020, our clients, thousands of them across Canada, were faced with uncertainty and the potential that their rehabilitation services would not continue," recalls Carolyn Miller, National Director, Client Experience, Rehabilitation Services at CBI Health.



She adds, "Microsoft Teams gave our clinicians the opportunity not only to stay in touch with and support clients, but to actually continue to provide active treatment and progression toward their health goals. Our clients and clinicians alike described that virtual care we provided on Teams as a lifeline."

"Our story highlights the agility and intuitive design of Microsoft Teams and Microsoft 365 as a platform," says Chojnacki. "We're a large organization with 12,000 staff across the country. We were in crisis management mode, and yet we were able to deliver new services through Teams in under two weeks."

Within a month, the majority of CBI Health had access to Teams. By then, the organization began to formalize remote recovery plans as it built a new support system for its rehab clients. But as its clinical staff shifted to working from home, demand ramped up for the organization's home care professionals.

Provincial governments across the country reached out to CBI Health to help meet the needs of clients who had been moved out of hospitals for their own safety. "We previously had nothing like Teams for our home health employees, but once we were asked to coordinate not just internally, but with local governments and even our competition, their ability to communicate broadly, meaningfully, and in real time became paramount," says Chojnacki.

Led by Chojnacki's team, CBI Health began to develop a new employee user experience in Teams. "We aimed to create a simple, intuitive, and versatile interface," says Chojnacki. "Not only did we make that possible through Teams, we also served our customers through our initial ad hoc implementation."

**Safeguarding vital health data:** Since the planning stages of its new cloud-based care system, CBI Health has made security a top priority. "If a solution provider doesn't make security one of the chief tenets of their product, then it's a non-starter for us," says Chojnacki. "With Microsoft 365, you can tell right away that security is a major part of the solution's design and implementation.

Across the healthcare industry, organizations must take the security of patient data seriously, but Canadian healthcare providers have recently experienced attacks from outside hackers. International operators constantly attempt to gain access to these organizations through sophisticated phishing attacks, among techniques. In 2018, as CBI Health vetted multiple cloud-based service providers, the organization made the replacement of its aging security information and event management solution a top priority.

Of all the replacement options available, CBI Health determined that Azure Sentinel best met its needs. "Our journey to an improved security posture required us to manage alerts and respond to security events with a level of sophistication that we just didn't have," recalls Chojnacki. "Microsoft is newer to the security space than some of the other players there, but their approach is modern and innovative. It is a cloud-first solution built for flexibility and scalability, as modern infrastructures require. We even liked how reasonable the pricing structure is."

**The future of telemedicine:** CBI Health didn't stop with Azure Sentinel and Teams. "We're not looking to build an IT empire," says Chojnacki. "We are looking for strong technology platforms that underpin our modernization strategy, and Microsoft has that in spades. Every piece of Microsoft software we implement works wonderfully with our growing modern infrastructure."

# Centre for Addiction and Mental Health uses analytics to improve care

In Canada, one in five people experience a mental illness or addiction problem – well above the global average. But unlike physical illness, mental afflictions such as depression, anxiety, PTSD and eating disorders often go untreated as too many people choose to suffer in silence rather than seek professional help.

The Centre for Addiction and Mental Health (CAMH) is working to remove the stigma from mental illness and addiction while providing world-class care to those in need. As Canada's largest mental health teaching hospital, CAMH is a national leader in care, research, education and social change. The Toronto-based institution treats more than 34,000 patients each year.

Rebecca Comrie, CAMH's executive director of Performance Improvement, is responsible for using data and analytics to advance the hospital's mission.

"Today, there's a dearth of knowledge about the incidence and prevalence of mental illness in Canada and worldwide," Comrie says. "We're at the forefront of capturing meaningful information about the state of mental illness to better measure and improve health outcomes."

**Predictive analytics were used to accurately forecast equipment and staffing costs for a 23-bed acute care clinic.**

Comrie joined CAMH shortly after it implemented electronic health records (EHR), a major IT project that centralized patient records into an enterprise data warehouse. "But we quickly realized an EHR system alone doesn't mean meaningful data," she says. "And it certainly doesn't mean meaningful information."

Curiosity was starting to build around how EHR information could help solve clinical problems. CAMH was amassing copious patient data on appointments, labs, medications, demographics and medical history. Comrie and others were eager to explore how CAMH could use this valuable information to improve clinical outcomes and streamline operations.

CAMH embarked on an enterprise analytics strategy aimed to combine its disparate tools, methodologies and processes into a single cohesive and consistent environment for analytics. "We had the ambitious goal of developing the best hospital analytics practice in the province, if not the country," Comrie says. "And we needed a solution to provide robust analytics for everything we might need."

CAMH licensed SAS Analytics, gaining a versatile analytics platform to manage, model and visualize data for a range of purposes. Comrie and her team soon began using analytics to address specific challenges across the organization.

**Predictive modeling in the emergency department:** One of Comrie's first projects was to analyze emergency department activity. To her clinical colleagues, the department was feeling busier than normal. Comrie offered to look into it.

After analyzing the data, Comrie and her team discovered that emergency department visits had jumped 82% in the last six years. Next, they began modeling population data provided by the Ministry of Health to predict future emergency department activity. By knowing how many patients to expect, CAMH officials could devise the right care models and process optimization projects to accommodate future needs.

"We were able to provide a holistic data and analytics solution to support them not just in understanding the current situation but also to support their decision making in terms of program planning and quality improvement," Comrie explains.

In a similar project, Comrie and her team used SAS to optimize care for alternate level of care (ALC) patients – people who occupy acute care hospital beds but no longer require hospital care. By predicting which patients are ALC upon admission, CAMH can ensure these patients are seamlessly moved into the right care setting at the appropriate time. This also benefits the hospital and other patients by freeing up beds for those who need them most.


CAMH uses social determinant data captured at admission to perform this analysis. Throughout the project, they tested several predictive models including univariate and multivariate analysis. In the end, they landed on a predictive model that was 80% accurate – a major step forward in streamlining treatment for ALC patients and optimizing bed space.

As a public organization, CAMH receives government funding and thus must be adept at justifying funding requests for capital projects. If funding is unavailable from the government, money must come from private donors – which is often a challenging task.

Having succeeded in articulating operational needs for the emergency department and ALC patients, CAMH began looking at how to use data and analytics to secure government approval for a new clinic, as well as additional acute care services. The new clinic would divert emergency department traffic and provide a better care setting for certain patients.

Once again, Comrie and her team helped their clinical partners formulate a business case to validate the demand for additional services. Using SAS predictive analytics, they were able to forecast things such as bedding and staffing needs, the number of patients expected each year and how many patients would be diverted from emergency departments.

In the end, the analyses helped secure approval for the new acute care unit as well as other services.

"Funders have to be confident in your data, your methodology and your approach," Comrie continues. "With SAS, we've been very successful on that front."

**Looking ahead, thinking holistically:** The Canadian government recently announced a historic four-year investment of $2.1 billion to further improve mental health and addiction services in Canada. With momentum building around its predictive modeling and analytics capabilities, CAMH is well-positioned to maximize this investment for those experiencing mental illness.

"Our partnership with SAS has really helped us give people a very strong impression of the 'art of the possible' when it comes to data," Comrie says. "We now have tools at our disposal to do all manner of things from an analytic perspective, and we've been able to open up people's eyes to what we can do with data and how it can really assist us in providing the best clinical care."

CAMH now is looking at things like artificial intelligence, telemedicine and genomic data analysis to provide a more personalized approach to mental health treatment.

"We're really trying to be more holistic in our understanding of the people we serve who may have other chronic illnesses and primary care needs," Comrie says. "The better we get at measuring success, the more we can deploy personalized treatments for our patients' well-being and health."

## Sanofi Pasteur

CONTINUED FROM PAGE 6

another 200 co-op positions will be created through this project. Sanofi Canada has signed on to the Government of Canada's 50-30 Challenge, pledging to increase the representation and inclusion of diverse groups within their workplace by attaining gender parity and significant representation of under-represented groups within their senior leadership.

The Government of Canada's funding for the influenza vaccine project comes from the Strategic Innovation Fund (SIF).

Thus far, the Government of Canada has invested in ten firms through SIF that accelerate vaccine, therapy and biomanufacturing capacity in Canada.

In March 2020, the Strategic Innovation Fund (SIF) was identified to deliver the Medical Countermeasures (MCM) initiative.

SIF was granted authority to invest $792 million under the MCM stream to fund clinical trials and manufacturing capacity at scale to increase the chances of timely vaccines, treatments and improve Canada's long-term pandemic preparedness. The first project, Abcellera Biologics, was announced within 19 days of the start of project negotiations.

The Medical Countermeasures stream is divided into three types of projects: vaccines, therapies and biomanufacturing projects. Under the MCM, to date SIF has 10 announced projects, including:

**Since 2020, Ottawa has invested in 10 firms through SIF that accelerate vaccine and therapy manufacturing.**

- Abcellera Biologics Inc. (British Columbia, federal investment of $175 million.) The project is in direct response to Canada's fight against COVID-19 and Canada's ability to respond to future pandemics. It will enable the rapid discovery of antibody therapies to treat and prevent COVID-19 and establish a Good Manufacturing Practice antibody production facility for Canada's long-term emergency preparedness.
- Variation Biotechnologies Inc.'s project supports the development of Canada's MCMs in immediate response to COVID-19. Variation Biotechnologies Inc. (VBI) will advance the development of an enveloped Virus-Like-Particle (eVLP) vaccine candidate for COVID-19 through pre-clinical studies and clinical trials.
- Precision NanoSystems Inc. will help advance the development of a ribonucleic acid (RNA) vaccine against COVID-19 through pre-clinical studies and clinical trials.
- Medicago's project advances a virus-like particle vaccine, developed on the company's unique plant-based production platform, through clinical trials. It will also establish a large-scale vaccine and antibody production facility to increase Canada's domestic bio-manufacturing capacity.

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VIEWPOINT

# Onboarding automation technology pays dividends during the COVID-19 pandemic

## An automated system enables Sunnybrook to track, manage and verify 71,000 requirements or credentials.

BY DR. ARI ZARETSKY

The COVID-19 pandemic has intensified many of the challenges hospitals around the world are facing, including the need to effectively and efficiently onboard healthcare staff and learners so they are ready to hit the ground running.

Credentialing and onboarding processes have always been critically important in healthcare to ensure compliance with regulations, guidelines, policies and procedures while also meeting the needs of new staff members and learners.

At Sunnybrook Health Science Centre, I oversee the training experience of 5,000 student learners each year across 30 health disciplines, from more than 50 different countries. They include residents, researchers, fellows, clinical instructors, and nurses in training.

Onboarding involves verifying qualifications, checking compliance documents, and tracking that information over time. This work is done manually at most hospitals – a slow, expensive and arduous process that also exposes organizations to unnecessary risks and liabilities.

In the past at Sunnybrook, every program and department across the hospital used different methods and systems – involving endless paper forms and multiple spreadsheets – to track, manage and verify 71,000 requirements or credentials, ranging from licensing to mask fitting.

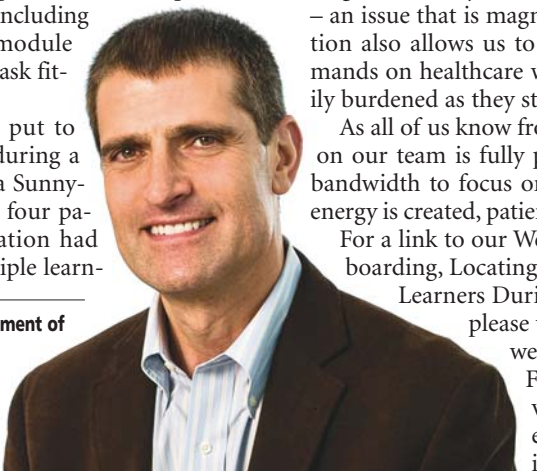
This meant long line-ups for new healthcare staff or learners on day one, delaying productivity. Furthermore, data gathering was inconsistent across departments, hampering accurate reporting and auditing.

Sunnybrook began automating the process for a seamless onboarding experience in 2018 by using NirvSystem blockchain technology.

This system has provided an efficient, paperless, and tamperproof means of verifying identities and managing the documents of the thousands of healthcare professionals, learners, support staff and volunteers that we routinely onboard at Sunnybrook – automation that will likely become the norm across institutions in the future.

Sunnybrook introduced the NirvSystem digital wallets in January 2020 to allow our learners to easily manage and share their credentials across multiple hospitals from their mobile device or directly through the NirvSystem web application. Our learners can now register and complete all requirements and onboarding details online. This saves valuable time and money while ensuring all processes are compliant and complete for credentials including licensure, insurance, e-module training, police checks, mask fitting and more.

> **Learners can manage and share their credentials across multiple hospitals from their mobile device or directly through NirvSystem on the web.**



This automation was put to the test in August 2020 during a COVID-19 outbreak on a Sunnybrook trauma ward with four patients affected. The situation had potential impact on multiple learners: orthopedic residents, neurosurgery residents, general surgery residents, medicine residents, medical students, speech-language pathologist students and nursing students.

There was a need for rapid communication to notify learners about the outbreak, and to test those who had worked on the ward in the previous two weeks. We also needed to identify high-risk residents and other learners in order to evaluate their need for isolation.

NirvSystem provided the data and efficiencies required to minimize COVID-19 exposure and keep staff safe. Administrators were able to work from home and we knew who was on a given floor at all times. We were able to ensure compliance with all internal and external regulations and requirements, even as they changed. We were also able to do remote onboarding interactions for hospital items from badges to lab coats and scrubs, while ensuring we were prepared with a proper inventory of PPE.

Given the complexities hospital systems face, it is not possible to meet day-to-day onboarding challenges efficiently and effectively without automation – an issue that is magnified in a pandemic. Automation also allows us to minimize administrative demands on healthcare workers who are already heavily burdened as they strive to keep patient care first.

As all of us know from experience, when everyone on our team is fully productive and has additional bandwidth to focus on what matters most, positive energy is created, patients benefit, and everyone wins.

For a link to our Webinar: Mission Critical: Onboarding, Locating and Communicating with Learners During and After the Pandemic. please visit https://nirvsystem.com/webinar/

For more information, please visit www.nirvsystem.com or email us at info@nirvsystem.com

**Dr. Ari Zaretsky is Chief, Department of Psychiatry and Vice President Education, Sunnybrook Health Sciences Centre, and Professor, Department of Psychiatry, University of Toronto.**

# Accelerating systematic reviews for every field of medicine

OTTAWA – A few years ago in Ottawa, Dr. Dayre McNally, a pediatric intensivist and researcher at the Children's Hospital of Eastern Ontario (CHEO), became frustrated while completing a systematic review detailing the effects of Vitamin D deficiency on children. After several months of tedious work, evaluating thousands of published studies, he decided there had to be an easier, more enjoyable and faster way to complete systematic reviews.

Every medical professional understands that systematic reviews are the gold standard and pillar of evidence-based medicine. Unfortunately, the process is extensive and usually requires a small team of experts to review thousands of publications to establish evidence-based management recommendations for medical practitioners. "But the finite number of reviewers with already busy schedules – clinics, surgeries, consultations and their personal life – struggle to find time to complete this meticulous task. Consequently, it can take anywhere from months to years to complete a single large review," said McNally.

Making matters worse, there has been an avalanche of new data since the start of the COVID-19 pandemic, highlighting the even greater need for new approaches. For example, according to Nature Research Journal, between 100,000 and 200,000 scientific publications were published last year alone on SARS-CoV-2 and COVID-19, and more than 30,000 pre-publications have yet to be reviewed by researchers. As a result, the steady supply of research and guidelines doctors and the healthcare system rely on could be compromised.

McNally connected with Algonquin College's Social Innovation Lab – a program that pairs the college's technology students, staff, and faculty with community experts to develop solutions that serve the public good. Together, along with a team of clinicians and researchers at CHEO, they launched insightScope, a systematic review software platform that leverages communities and crowdsourcing. It also draws on global expertise to expedite the timeline for completing systematic reviews in healthcare, ultimately getting evidence-based medicine to the bedside faster.

> **It's well understood that systematic reviews are the gold standard and pillar of evidence-based medicine.**

"Each project starts with a researcher, who contacts insightScope to present their project. Qualifying projects are loaded onto the platform and promoted to the medical community, particularly to those with a specific interest in the question," said Kevin Holmes, managing director at Algonquin College, Social Innovation Lab. "The community can read the protocol and complete a training set, confirm their interest and demonstrate the necessary skills and aptitudes to work on the project. The project is then assigned to a team of vetted reviewers who work together to complete the systematic review."

Today, despite only recently being made available for use outside of

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# Software-as-a-Service can make healthcare organizations more efficient

BY BASSAM HEMDAN

The COVID-19 pandemic has quickly transformed how Canadian healthcare organizations deliver IT services to their employees, suppliers and partners. In 2018, Statistics Canada reported that less than 10 percent of Canadian employees worked from home once or twice a week. By mid-2020 that figure had grown to 40 percent.

While some healthcare workers like nurses, doctors and clinicians still must be on-site most of the time, administrative and IT staff are working from home more frequently.

This means hospital IT staff are challenged to protect and back up information that's more distributed than before.

Pre-pandemic, with almost all employees working from a central site, or several closely connected sites, IT administrators could perform data backup and protection at one central data centre. Now, with employees working from home on laptops outside a healthcare organization's own network, it's a bigger challenge.

Bassam Hemdan

COVID-19 has also made it more difficult for Canadian healthcare organizations to run their data centres. Lockdowns and social distancing mean it's not feasible to have as many employees physically in a data centre as you could pre-pandemic. This makes it tougher to perform upgrades, add capacity and manage data storage, backup and protection.

Fortunately, Software-as-a-Service (SaaS) backup and protection solutions are allowing Canadian healthcare organizations to extend their reach beyond the data centre. Cloud-based SaaS offerings can reduce the pressure on overworked data centre teams and allow hospitals and clinics to focus more of their resources on what they do best – frontline healthcare.

Below are some of the top benefits organizations shifting to a SaaS-based data backup and protection solution can realize.

**Scalability and flexibility:** SaaS backup solutions allow you to add or reduce capacity with the click of a button. IT staff don't have to make a hardware purchase, wait for the purchased equipment to arrive on site, rack it up, install the software and test it before it's ready to go, as they would with a traditional data centre solution.

With SaaS backup, they can add capacity in minutes rather than weeks. And administrators don't have to worry about having extra backup capacity that's not being used. With a SaaS solution, healthcare organizations can scale their backup and storage to their exact needs and pay for only what they consume.

**Simplicity:** A well-designed SaaS backup and protection solution can give you a single-pane-of-glass view into your entire data environment, including public cloud, private cloud, on-premises and O365. In fact, organizations that switch to SaaS backup and protection can expect to realize savings of between 30 percent and 45 percent in administrative time and management.

Having a single view over the entire enterprise backup and protection environment has become especially important because of data becoming more dispersed as a result of the pandemic. More data is moving closer to the network edge. By 2023, IDC predicts 60 percent of data will reside at the edge. With SaaS, administrators can backup and protect edge data as easily as they backup and protect data anywhere else on their network.

**Cost:** In a traditional data centre environment, if a hospital wants to add storage or backup capacity, it needs to budget for significant up-front expenses including hardware and software and get board approval for the project. With SaaS backup

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# Canadians have deployed a variety of systems to track COVID vaccination data

**Providers want to be able to share the data with patients and with other systems.**

BY DIANNE DANIEL

Canada's mass COVID-19 immunization program is centred on getting the right dose into the right arm at the right time. Those at the digital front lines of the vaccine rollout would add another critical 'R': the right information.

From e-booking and scheduling, to coordinating clinics and capturing pertinent data, to connecting to backend immunization registries, digital solutions are rapidly evolving to support the complex process of administering multiple vaccines in changing dose schedules to different groups of people based on eligibility.

The end goal? To make getting a vaccine as efficient as possible while collecting vital data down to the individual patient level, even if it means relying on a patchwork of systems due to the lack of a harmonized national platform.

"I think a window has opened with COVID," said Cameron Bell, chief technology officer at CANImmunize, a company working to modernize Canada's immunization system. "There's always a flurry of activity at the moment of crisis and then things go back to the old ways. I hope we take this opportunity to actually bring in concrete changes."

CANImmunize launched as a business in 2019, but its digital immunization work began eight years earlier when Bell partnered with Ottawa Hospital senior scientist and CANImmunize founder Dr. Kumanan Wilson to create an app to help Ontarians track their personal vaccinations.

At the start of the pandemic the company was working with Bruyère Hospital in Ottawa on a system to give employers the ability to manage mandatory staff vaccinations. Last fall, it quickly pivoted to tackle a different challenge.

The hospital was setting up its annual flu shot clinic and was looking to go paperless. Together with CANImmunize, it developed an end-to-end immunization clinic management system called Clinic Flow, a system that supports online booking, data capture, digital receipts and digital reminders, and also integrates directly to Panorama, a provincial immunization registry.

When COVID-19 vaccines began to arrive in Canada, the company partnered with Nova Scotia to advance the technology and it is now used to manage the vast majority of vaccinations in that province, as well as to support e-booking of vaccination appointments in Yukon.

Using Clinic Flow, Nova Scotia residents book their first and second dose appointments online, completing health screening and consent forms at the same time.

When they arrive at a clinic, an immunizer reviews their information on a tablet and decides whether they are eligible to proceed to vaccination. If not, the reason is documented.

The system also captures any adverse events noticed during the waiting period as well as the inventory lot number for each dose administered, a mandatory field that relies on standardized vaccine information from the Canadian Vaccine Catalogue published and maintained by CANImmunize.

"What Nova Scotia has done really well from the beginning is prioritize," said Bell. "They are meticulous about correcting records that were entered incorrectly and they have extremely high standards with respect to the data going into the system."

Dr. Wilson sees accuracy of immunization records as an important step in the journey towards a pan-Canadian digital system. CANImmunize is currently working with Nova Scotia, Ontario and B.C. to create permanent connections between Clinic Flow and immunization repositories, with the over-arching goal of allowing individuals to contribute data to their own immunization records.

The company is also working with the Canadian Vaccine Safety Network to facilitate adverse event reporting.

Newfoundland is another province benefitting from the trial run of a digital flu program last fall. Early on, the provincial government mounted an ambitious campaign to increase the number of flu vaccines administered from between 20 and 30 percent of the population to 85 percent.

ILLUSTRATION: LINDA WEISS

That meant ensuring the province's four regional health authorities had the resources required, and that information would be consistently tracked and reported on, and captured in one place.

After deciding to use the provincial electronic medical record (EMR) – called eDOCSNL and provided by Med Access – as the best application to manage community-based flu clinics, the province chose an e-booking system from Pomelo Health to alleviate the administrative challenge of managing such a large campaign.

"They anticipated hundreds of thousands of vaccines being carried out at public health sites and they simply didn't have the administrative capacity to book and oversee a campaign of that magnitude, so they looked at an electronic solution," said Fred Melindy, director of eDOCSNL at Newfoundland and Labrador Centre for Health Information (NLCHI).

Prior to rolling out the online solution, parts of the province with limited cellular and Wi-Fi were relying on "old school paper and pen with a calculator alongside to do tallies," added Cindy Clarke, NLCHI director of eHealth Programs. The push to connect all regional health authorities on one system resulted in an extremely successful flu campaign that served as a testing ground for the far more complex COVID-19 vaccine rollout.

For COVID-19 immunization, each authority is using its own instance of the Pomelo Health e-booking platform and can customize the content based on where they are in the provincial rollout strategy.

When people click on the link to book, they are presented with appointment types and availability. After they book, they are sent reminders and can confirm their appointment, and all patient booking information is sent from Pomelo Health to the EMR.

Because it's difficult to forecast which vaccine will be at a particular site when, only first dose appointments are booked online and second dose appointments are booked at point-of-care, yet all are coordinated in Pomelo Health, including call-in appointments.

As an additional validation step, NLCHI developed a separate pre-registration system in-house. It is used to prioritize groups being targeted for specific phases of the vaccination campaign, and to help plan where clinics should be located and how they should be staffed. All three systems – the pre-registration app, e-booking and the EMR – are connected, making it possible to effectively plan capacity and workload at each clinic so resources can be assigned accordingly.

"A large part of the decision to use Med Access for documenting immunizations and collecting data was the integration link with self-booking," said Melindy. "It's really made it possible to do a more correctly resourced and more efficiently rolled out immunization campaign than we've ever had the capacity to do here in the province."

"Going this route really streamlined the province despite our geographic and regional differences," added Clarke. "Having one provincial solution helped bring everyone together, using the same process with the same tools, and actually generating the same type of data and reports. That is a big bonus."

In Ontario, each public health unit is developing a vaccine plan tailored to their own community's needs, but all vaccinations are documented in the

provincial COVID-19 immunization registry called COVAX. One company that quickly pivoted to help Ontario hospitals and public health units to automate their vaccine clinic workflow is Verto Health.

The company's digital twin platform is designed to automate care pathways and prior to the pandemic, it was focused primarily on helping cancer and chronic disease patients to track their journeys through the healthcare system. Its new vaccination solution for COVID-19 allows patients to self-schedule and manage their appointments online, handles patient consent and eligibility, and streamlines vaccination workflow at clinics.

"E-booking solves just one part of the problem," said Verto Health founder and CEO Michael Millar. "The real advantage is in optimizing the flow of patients as they move through the vaccination centres and making sure we don't lose track of them for second dose follow up."

The Verto Health platform enables eligible people to book, cancel or reschedule appointments online, with either SMS or email confirmation the day of the appointment as well as a cancellation link. A dashboard based on the Kanban workflow management methodology is provided to hospitals and public health units so they can coordinate distribution of vaccines across a region, and to immunizers at clinics so they can see at a glance who is scheduled for the day.

One advantage of the digital twin technology is the ability to easily integrate to other systems – like the province's COVAX registry – and to react swiftly to policy changes. If the dosing schedule changes, for example, second dose appointments can be automatically adjusted to the next available date.

Women's College Hospital (WCH) in Toronto was an early user of Verto Health's platform. When it launched its initial community clinic in late January, community partners were manually scheduling appointments for high priority healthcare workers for the first three days before transition to e-booking.

"We were able to register them in the provincial COVAX system once they arrived, but it was incredibly time consuming and very inefficient and took a lot of human resources," said WCH CIO Drew Wesley. "The team responsible for scheduling had a very loud cheer when the Verto Health application was up and running," he added.

WCH has since partnered with other hospital clinics in the Mid-West Toronto Ontario Health Team to coordinate vaccinations through vaccine.to.ca, a site implemented by Verto Health to serve as a digital front door to Toronto hospital vaccine clinics. When patients book appointments, the data is imported directed into COVAX so that when clinics open, people are already pre-registered in the system.

"The Verto Health platform is not only helping us manage very well the appointment booking portion of clinic operations, but also helping us understand the flow of individuals who are coming to our clinic. That's the digital path," said Wesley. The ability to track people also means less vaccine wastage due to no shows.

At the backend, COVAX is helping to manage inventory by recording the type of vaccine given down to lot number with very detailed reconciliation taking place, he added. Though the system itself is not an "intensive data source," said Wesley, it is quickly evolving. "There are a lot of moving pieces happening at a very rapid pace, but we have good technology partners working together to try and help us better manage the process."

Collaboration is the driving force behind Project ABC, a Digital Technology Supercluster project under way in B.C. led by Cambian Business Services Inc. ABC is short for authorization, booking and coordination of widespread testing and immunizations. The project collaborators – including LifeLabs, IBM Canada, WELL Health, Tickit Health, Providence Health Care and Simon Fraser University – are working to integrate systems and provide automated vaccination tools, including QR codes, to remove bottlenecks in mass immunizations.

"A lot of the things we focused on were about how we could support better public health for Canadians," said Cambian CEO Bruce Forde, noting that much of the infrastructure that Project ABC came up

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# MEDFAR introduces the MYLE Electronic Medical Record to British Columbia

Riding the wave of success in Eastern Canada, MEDFAR Clinical Solutions is bringing its MYLE Cloud EMR solution to British Columbia. Focused on primary care, MYLE is complementary to its recent acquisition of Plexia Electronic Medical Records, a well-established specialist EMR solution in British Columbia.

Offering the best-in-class solution to both segments of outpatient clinics, we believe that MEDFAR can now boast of having the two best EMRs in the Canadian healthcare sector.

MYLE has been fully adapted to the provincial standards and connected to all of the regional healthcare ecosystems and was launched in April of this year.

"We want to be the best at what we do," said MEDFAR co-founder and CEO Elias Farah. "Our mission has always been to drive excellence and efficiency in healthcare. That's a precision game and it requires focus."

MEDFAR has rapidly evolved its MYLE EMR into a comprehensive solution that supports every step of the care journey, facilitates clerical tasks, enables caregivers, drives patient engagement, and fosters collaboration, whether care is delivered virtually or at the clinic.

This unique solution fully integrates e-fax, virtual consultations with MYLE Telemed, the MYLE Patient Portal, the Care Plan to manage preventive care and follow-ups, SMS appointment confirmation, a reporting and business intelligence module with MYLE Analytics, as well as the new MYLE Kiosk that allows patients to self-register at the clinic.

With the exponential growth of the medical literature, the steep increase in medical testing and the expanding complexity of patients with more comorbidities, physicians need to navigate through unprecedented amounts of information.

It is not just a matter of efficiency, but quality of care and patient safety. "MYLE stands for 'Make Your Life Easy' because its objective is to streamline and facilitate the access, exchange, analysis and organization of the relevant information, so that physicians can make the best decisions. MEDFAR believes in empowering physicians to do what they do best: care for their patients," adds Farah.

Service is another critical element to being the best EMR provider in Canada. "We're in it for the long game. Our users need to be successful for MEDFAR to succeed," says Farah. "We see very clearly how various clinics optimize their workflows and get a decisive lead with MYLE. We share those best practices with the whole MYLE community. Client success is an obsession. How could we be trusted otherwise?"

With that in mind, MEDFAR dedicated several teams to focus exclusively on servicing our family of EMR users. Onboarding is key to getting started on the right foot. Careful attention to data migration makes the transition painless and easy.

Everything from setting up the environment, training and go-live is organized and executed with precision. And the Onboarding team is a reference. They train every month on new and existing features to continuously refine their knowledge. The director of Onboarding himself comes from the world of change management and continuous improvement with the Lean methodology.

Customer Success is achieved by obtaining user feedback, listening to what works and what can be next in MYLE's aggressive innovation roadmap. The effort is supported by the MEDFAR Academy, which creates training material and organizes events to improve users' skills and facilitate the adoption of new MYLE features.

Finally, MEDFAR offers a constant safety net, just in case: Customer Support picks up the phone 24-7, coast to coast. Every call is tracked; information is leveraged across the organization especially in MEDFAR's product management and technology teams. Everything captured is considered as critical information for the evolution of products and services.

# Juno EMR was built to address the inefficiencies of electronic records

BY RICHARD ATKINS

Why are ever-increasing numbers of Canadian medical practitioners choosing Juno EMR as their patient management platform? Simple. It lets them spend more time with patients and less on patient admin.

Currently in use at 400+ clinics with 3,000 practitioners managing over 3.5 million patient charts, Juno EMR (Juno) has remained one of the best kept secrets in Canadian healthcare. But rising sales indicate that the secret's out.

In a recent survey, 97 percent of Juno customers said they'd recommend it to their colleagues. Currently, some 48 percent of Juno clinics are GPs, while the other 52 percent are allied health professionals. The positive sentiments concern Juno's feature range and best-in-class service vs. other providers that are not solely invested in the medical sector.

Juno is wholly-owned by CloudMD (www.cloudmd.ca), a pioneer in the delivery of ubiquitous whole-patient care for all. CloudMD knew that Canadian EMR platforms were lagging behind comparable solutions in other industries, impacting the efficiency and accuracy of patient care, while consuming practitioner time. So Juno EMR was built to address the inefficiencies of EMR software for practitioner use, and the perceived poor customer service within the EMR market.

Juno was built on OSCAR, due to its pre-existing large footprint in the market as an open source EMR and practice manager software application. Juno delivers a more flexible and intuitive user experience, enabling practitioners to spend more time on patient care.

Typical EMR platforms include features often known only to power users. But Juno is easily customized, giving every clinician access to the full power of their EMR software.

Juno quickens workflow for practitioners, and reduces the click-path to pertinent clinical information. Customizable templates, adaptable to every type of practice, ensure practitioners drastically cut their admin load.

Let's look at Juno features, including what's coming in future rollouts.

Simplicity of use. Juno is clean and intuitive with a modern user interface, drag and drop scheduling, note/form templates, patient self-scheduling, appointment confirmations and more.

Continuity for clinics. Practitioners can use classic OSCAR as needed by toggling between Juno and OSCAR UIs.

SaaS based, hosted in secure Canadian data centres. Clinics need not buy or maintain special hardware or concern themselves with local servers crashing or security issues.

Constant access. Web-based, Juno can be accessed via any device, any time.

Flexibility. Juno can be configured to meet most clinics' needs (GP or allied health professional). Users quickly become operational, with 1-1 training and onboarding that is second to none in the industry.

Integration. Billing is seamlessly integrated into Juno, through its ClinicAid billing system, a recognized leader in Canadian billing, handling tens of thousands of invoices daily. Integrations with labs, prescribing and fax systems are included.

Utilizing a patient portal, patients can self-schedule and manage their appointments in real time, including hi-resolution telehealth. Virtual appointments show up immediately, displaying a camera icon to the practitioner, and can be launched from within Juno. CloudMD offers Juno as part of its B2C virtual offering. Patient charts are created in Juno in the backend during every encounter. More than 150,000 subscribers have already downloaded the app for this service. As new virtual-only clinics emerge, they are also using Juno in the backend for their patient charts. For more information on Juno go to www.junoemr.com/CHT

*Richard Atkins is Group Sales Director at CloudMD Software & Services Inc.*

# CAN Health Network and MEDTEQ aim to drive healthcare innovation

CONTINUED FROM PAGE 8

eral governments, MEDTEQ is an innovation ecosystem with more than 200 members, including startups, SMEs, large multinationals, universities, research centres and hospitals. Though heavily Quebec-centric, it boasts a handful of large teaching hospitals and health authorities across the country among its members and has plans for further expansion across Canada.

While its Beachhead program links startups and SMEs with health organizations, it offers a broad range of additional services to assist health technology companies scale up through grants, investments, prototype development and business coaching.

"Our Toolkit is designed to help support companies through the various stages of development from idea to international markets," said MEDTEQ CEO Diane Côté.

To date, she noted, MEDTEQ has made 16 or 17 investments totaling $6.5 million. That, in turn, has leveraged a further $75 million in investments from other sources.

Ideas for innovative health technologies come from health technology companies, as well as from clinical members, noted François Bergeron, MEDTEQ's Vice President of Partnerships.

"We like when the ideas come from clinical sites, because it means there's an identified clinical need that is not being met. That allows us to help the clinical site find an industrial partner to work with. Very often, it also happens the other way when industry comes to us with a prototype or an idea."

In other cases, a big company will look for a very specific area of expertise from a startup or SME.

"We excel in facilitating introductions," said Côté. "If a company comes to us with this really great technology, but needs a partner to make something happen because they don't have the skillset internally, we can introduce them to lead scientific players, lead clinical players, or even industrial partners.

**MEDTEQ's investment of $6.5 million has leveraged further investments of $75 million from other sources.**

"Alternatively, they may come to us and say 'I want to work with this multinational company.' Well, what door do they knock on? Who is the right person to talk to? It's the same for an SME that wants to work with a hospital or with clinicians who can help them."

MEDTEQ prides itself on growing champions like Imagia and Aifred Health, two Montreal companies specializing in artificial intelligence.

Imagia, founded in 2015 by Alexandre Le Bouthillier and Nicolas Chapdos, has developed an AI collaboration platform designed to accelerate diagnosis and treatment selection for cancer and Alzheimer's patients. The company has raised more than $46 million in financing to date and has projects with clinical sites across North America.

Aifred Health, another Montreal-based champion nurtured by MEDTEQ, received $4 million in seed financing in December to fund a clinical trial designed to test the safety and effectiveness of its AI technology for recommending personalized therapeutic treatment for patients suffering from clinical depression.

The technology analyzes patient responses from periodic questionnaires asking them to describe their feelings and provides a snapshot of a patient's mental health over time. The solution is currently being piloted without the AI component at the Douglas Mental Health University Institute, the Jewish General Hospital and the Centre intégré de santé et des service sociaux de l'Outaouais in Gatineau.

Founded by four McGill University graduates, Aifred Health is a top three finalist in the global IBM Watson XPRIZE competition.

The CAN Health Network and MEDTEQ models may overlap to some degree, but are essentially different. The CAN Health Network, according to Dr. Morra, operates on the demand side as an integrated marketplace, while MEDTEQ functions primarily on the supply side and describes itself as an accelerator.

"I don't think we're in competition," said Dr. Morra. "It's a big ecosystem. There are multiple ways health technology companies can accelerate. Healthcare is 12 percent of GDP, so there's a lot of space for a lot of people."

Everyone wins, regardless of the model. "The healthcare system gets better because they have Canadian companies working on real problems," added Dr. Morra. "The companies win because they get access to healthcare organizations, and Canada wins because of the jobs that are created."

# Systems track COVID vaccination data

CONTINUED FROM PAGE 19

with builds out from the Panorama immunization repository.

Rather than relying on client registries or medical IDs to identify people within each phase of the vaccine rollout, the Project ABC approach enables people to register for themselves. Pending approval by the B.C. government, it is expected to be implemented this year. "Fundamentally, the technology we've got for doing the authorizing is based on a patient-reported model," explained Forde. "You register and say your age, demographics, conditions; we could go and verify that and audit it, but at a time when it's busy and everyone is trying to figure out what's going on, it's the honour system." The Project ABC booking system, which is integrated to Panorama, works behind the scenes as non-branded OEM software to enable people to choose a convenient vaccination site from a list and pick a date and time.

# Software-as-a-Service can be more efficient

CONTINUED FROM PAGE 17

there's no big capital expenditure – just a simple monthly recurring fee, backed by a service level agreement.

**Security:** Ransomware attacks continue to grow. With more people working remotely, Bitdefender's Mid-Year Threat Landscape Report 2020 said ransomware attacks had increased more than 700 percent year over year. Enterprise ransomware costs are also growing – from an average of US$2 million per endpoint breach in 2018 to US$9 million in 2019, according to the Ponemon Institute.

An effective cloud-based SaaS solution allows IT teams to protect their data no matter where it resides – on-premises, at an off-site data centre or on an employee laptop. It also encrypts data travelling across the network and ensures data can be accessed only by authorized users.

For Canadian healthcare organizations, data sovereignty is a must. Patient data is not allowed to be stored outside the country, so making sure your SaaS backup and protection partner has in-country data centres is important.

A SaaS-based backup and protection solution managed by a company with a background in data management and security can significantly reduce the budget and time constraints faced by healthcare IT teams.

**A cloud-based solution allows IT teams to protect data wherever it resides, on-premises, at an off-site centre or on a laptop.**

*Bassam Hemdan is Vice President Canada and LATAM for data protection and management leader Commvault and Metallic SaaS.*

# Systematic reviews

CONTINUED FROM PAGE 16

CHEO, insightScope has drawn a pool of more than 400 users from Canada and beyond, and anticipates the community will continue to grow given how effectively the platform reduces the timeline of a systematic review process. For example, in the early days of the pandemic, a team of researchers from academic centres in Ottawa, McMaster and Manitoba came together on insightScope to answer four important questions, synthesizing the evidence surrounding decontamination of Personal Protective Equipment.

"This large team was able to process thousands of papers in just a few weeks – their work was used by health authorities in Canada, and around the world," said McNally.

Since 2019, insightScope's crowd of scientists, researchers, and medical students have completed more than 275,000 assessments on 66 projects. The clinicians, researchers and scientists who have developed insightScope believe this number will grow as more health and scientific organizations learn about the platform and appreciate how the collaborative approach can help rapidly answer important questions, while promoting learning, networking and scholarship.

Knowing early on that they would seek out participation from the medical community around the world, insightScope built their Software-as-a-Service solution on the cloud. "We opted for the global cloud provider, Amazon Web Services (AWS), which also made it easy for us to scale our solution on-demand – as reviewers log on at all times of the day," Holmes said.

Given the quantity and nature of the data, as well as the need to be able to compare it rapidly and efficiently, insightScope uses Amazon Relational Database Service (Amazon RDS), which makes it easy to set up, operate, and scale a relational database in the cloud. Additionally, the reliability and security were some of the deciding factors to develop the software on the AWS cloud.

"Looking ahead, we hope to advance insightScope to the point where a collaborative large team approach becomes the default in medicine and beyond," McNally said.

While the team is pleased with the product and progress to date, a number of additional improvements are planned to better meet the needs of the community. For example, reviewers will be notified when they provide an answer that differs from that of their team's. Highlighting these conflicts provides an opportunity to improve the quality of the project, as well as educate the individual and the community.

**Since 2019, insightScope's crowd of users has completed more than 275,000 assessments on 66 projects.**

The team is also investigating features that allow for the rapid updating of existing reviews when new evidence emerges.

In addition, insightScope is looking to AI and machine learning (ML) to further optimize the software. For large reviews, an initial set of 1,000 assessments are assessed in duplicate, sometimes triplicate, by the team of human screeners. These citations and outcomes are then fed into machine learning algorithms demonstrated to be useful on other large systematic reviews.

"Early results suggest that a hybrid approach of human screening and ML could significantly reduce the number of assessments required by human reviewers, from 35% to 40% of the total work required in the first stages of the systematic review process, without compromising review quality," said McNally.

Finally, insightScope is working on launching a version of the platform suitable for use at medical conferences to implement "Evidence Hackathons" into the scientific programming.


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